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ABSTRACT

In an effort to identify, categorize, and prioritize the research needs facing Tech Prep Teacher Education over the next 10 years, a study was conducted of a selected sample of nationally recognized experts in Tech Prep. A three-round Delphi survey approach was used to generate responses and achieve consensus among the experts. The first questionnaire, designed to generate or identify research needs for Tech Prep Teacher Education, was completed by 33 experts. Responses to this survey were coded and categorized, resulting in 98 identified research needs and priorities in the following focus areas: marketing strategies, partnerships and linkages with business, staff development and professional training, curriculum criteria and performance standards, and evaluation methodologies and program assessment. For the second questionnaire, 30 of the original respondents rated the research needs and ranked the 10 categories in order of importance. For the third questionnaire, 27 of the original respondents reviewed responses from round two and contrasted them using group consensus data. Based on a 5-point scale, 26 of the 98 research priority items had a mean score of 4 or more points, while the highest rated priority was "institutionalize tech prep into the higher education delivery system." The category for research in instruction and curriculum development ranked the highest in importance with a mean of 3.074. The survey instruments and a list of the 25 states represented in the study are appended. (TGI)

A DELPHI STUDY OF TECH PREP INITIATIVES IN HIGHER EDUCATION: RESEARCH PRIORITIES IN TE/ CHER EDUCATION

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A DELPHI STUDY OF TECH PREP INITIATIVES IN HIGHER EDUCATION: RESEARCH PRIORITIES IN TEACHER EDUCATION

Abstract

The primary purpose of this study (qualitative and quantitative) was to establish a research agenda (goals and directions) that would expand the knowledge base of Tech Prep Teacher Education. The research needs facing Tech Prep Teacher Education over the next 10 years were identified, categorized, and prioritized, based on the results of this study. A three-round Delphi survey approach was used to generate responses and achieve consensus from a selected sample of nationally recognized experts in Tech Prep. Round one questionnaire was used to identify and categorize the findings into 10 tentative major research focus areas for example marketing strategies, partnerships and linkages with business, staff-development and professional training, curriculum criteria and performance standards, and evaluation methodologies and program assessment. The response from the second and third-round questionnaires were analyzed with descriptive statistics. The results of this qualitative study should be useful to teacher educators in providing assistance in restructuring and advancing future research efforts in Tech Prep Teacher Education.

What is Tech Prep Teacher Education?

Technical preparation, commonly referred to as *Tech Prep,* is embodied in the literature of vocational education and authorized by Congress with the passage of the Carl D. Perkins Vocational Applied Technology Education Act Amendments of 1990, which specified Tech Prep initiatives under Title II and III, Public Law 101-392. The concept of *Tech Prep* was initially discussed during an American Vocational Association (AVA) Workshop Symposium (Bottom, 1994). However, Dale Parnell coined the phrase *Tech Prep* in his book, *The Neglected Majority*, which introduced the 2 + 2 Tech Prep/Associate Degree program (TPAD). The TPAD concept, according to Parnell (1991), is essentially a new approach to what has sometimes been called vocational education. The concept is designed to integrate academic subjects (i.e., mathematics, and science) with vocational-technical education subjects (i.e., engineering technology, applied science, and mechanical, industrial, or vocational subjects, such as agriculture, health, and business).

The guiding concept of Tech Prep Teacher Education may be defined as the preparation of technical teachers and workers with the state-of-the art skills and competencies in applied technologies. Currently, little knowledge exists regarding Tech Prep Teacher Education primarily because the concept is still in the embryo stage. In order to meet the demands for world-class workers and technical teachers, we need to have a world-class technical teacher education program. Therefore, the results from this study should generate pertinent information in order to provide a framework for research in Tech Prep Teacher Education.

Purpose of Study

The primary purpose of this study (qualitative and quantitative) was to identify, categorize, and prioritize research needs confronting Tech Prep Teacher Education over the next 10 years. A three-round Delphi survey approach was used to generate response and achieve consensus from a select sample of subject matter experts (SME) in Tech Prep. The findings should contribute to the scholarly efforts being made to establish a research agenda for Tech Prep Teacher Education.

The research questions for this study were:

(1) What are the proposed research needs of Tech Prep Teacher Education over the next 10 years?

(2) What are the major research categories over the next 10 years that were identified by subject matter experts (SME) in *Tech Prep*? and

(3) What should be the research priorities for Tech Prep Teacher Education over the next 10 years?

Procedure

The research procedure for this study consisted of a Delphi survey approach. A Delphi approach uses the informed judgments of respondents to eventually reach consensus regarding selected topics. Thirty-three (33) respondents were given a series of questionnaires and through controlled feedback with each round, carefully considered group opinions were formed. Fifty-six Tech Prep experts were contacted and 37 agreed to participate. However, only 33 respondents completed the first round, 30 completed rounds one and two and 27 completed the three-round process.

Round one: The first questionnaire was mailed in March (1994), and the respondents were asked to generate or identify research needs (priorities) for Tech Prep Teacher Education over the next ten years. Upon the return of Round one questionnaire, a panel of subject matter experts (SME) in Tech Prep coded and categorized 187 identified research needs and priorities according to major focus areas. Efforts were made to eliminate duplication by editing and modifying some of the 187 identified research needs, thus reducing them to 98 research items.

Round two: The second questionnaire was mailed in April (1994) and contained the results of 98 research items generated from 33 respondents in round one. The respondents were asked to rate each item in, **Part A**. by placing an **(X)** in the appropriate space using the assigned 5-point Likert scale. **In Part B**, the respondents were asked to rank the 10 major research categories in their order of importance with the number one being the most important and the number 10 being the least important.

Round three: The third and final questionnaire was mailed in May (1994). In round three, the respondents were asked to review their round two responses and contrast them using group consensus data. The respondents round two responses were tabulated to include the following information: (a) interquartile range, middle 50% of all responses; (b) median; and (c) mean. The respondents initial ratings on the round two questionnaire were identified with a blue dot. Based on the information provided, the respondents could keep their initial rating or change it by placing an **(X)** in the space for the new rating. An explanation was requested for the new rating of any research item that was outside the group consensus (interquartile range).

FINDINGS

Research Priority Items with High Ratings

Twenty-six of the 98 research priority items had a mean score of four or more points, based on the assigned five-point Likert scale. **Research priority item 11 had the highest rating with a mean score of 4.48.** Item 11 was stated as: "Institutionalize Tech Prep into the higher education delivery system and focus instruction on data from learning styles/cognitive sciences research, and non-traditional teaching methods." The remaining 25 research priority items and their mean scores were stated as:

Item 35 received a mean score of 4.44 - "What type of staff development will help teachers and schools to create practices that result in higher performances by all students?"

Item 21 received a mean score of 4.41 - "What techniques or models can be used to create or enhance relationships and curriculum development between and among: (a) academic and vocational/technical instructors, (b) secondary and post-secondary staff, and (c) educators and business/industry representatives?"

Item 4 received a mean score of 4.37 - "How important is articulation between programs and what are the most useful models for articulation with local high schools, community colleges and four-year universities?"

Research Priority Items with High Ratings

Item 43 received a mean score of 4.33 - "To shift the paradigm of all teaching from content-oriented learning to applied work-based contextual learning."

Item 7 received a mean score of 4.30 - "What will business/industry personnel need to know and be able to do to participate in Tech Prep programs?"

Item 15 received a mean score of 4.30 - "How can teacher education programs be redesigned to ensure that teachers are competent in the use of active and diverse teaching methodologies."

Item 8 received a mean score of 4.26 - "Identify or develop counselor education pre-service programs which include an appropriate emphasis on career development, career assessment, career guidance, leadership of assessment and guidance teams, and awareness of full range of post-secondary educational options."

Item 17 received a mean score of 4.26 - "How can teacher education programs be structured to provide future teachers with an understanding of an appreciation of technical career fields?"

Item 48 received a mean score of 4.26 - "How can we develop effective teams of educators, counselors, and industry mentors to ensure the quality and consistency of the work-based education component of the school-to-work transition program?"

Item 55 received a mean score of 4.26 - "What school and classroom conditions will enable 90 percent of high school youth to master more advanced academic and technical content?"

Item 12 received a mean score of 4.22 - "Identify or develop effective means for improving the instruction in colleges of education resulting in modeling of instructional strategies and techniques appropriate for Tech Prep education."

Item 28 received a mean score of 4.22 - "To prepare all future teachers to recognize the need for business/industry/education, linkages and partnerships."

Item 9 received a mean score of 4.19 - "How can teacher education programs prepare teachers to continuously and effectively modify curricula in collaboration with persons who are not *educators* in the traditional sense?"

Item 10 received a mean score of 4.19 - "What are the curriculum requirements and needs for Tech Prep Teacher Education, and what are the most valuable philosophical and pedagogical foundation for Tech Prep Teacher Education Programs?"

Research Priority Items with High Ratings

Item 34 received a mean score of 4.19 - "How can university professors best be trained in the use of applied methodologies, and how should the delivery of teacher education courses be modified so that professors can appropriately model applied methodologies?"

Item 36 received a mean score of 4.19 - "How well prepared are teachers to advise students, mentor them, and help them to see how each Tech Prep component fits with each component in the overall program? (Are they able to support the articulation approach?)

Item 75 received a mean score of 4.19 - "Expand student teaching to include an industry-based internship. Require student-teacher to write and teach a unit of study-module that demonstrates the practical application of the academic discipline."

Item 32 received a mean score of 4.15 - "The impact of using an *applied or contextual* approach to teach mathematics and communication skills or the impact of student achievement on the applied academics."

Item 77 received a mean score of 4.07 - "Is there a difference in student achievement between students taught in traditional instructional settings versus applied settings and if so, among what student populations?"

Item 16 received a mean score of 4.04 - "Tech Prep education involves the integration of academic and occupational curricula which can be accomplish in a variety of ways. Which approach, or combination of approaches, is the most effective in terms of student achievement and faculty satisfaction?"

Item 29 received a mean score of 4.04 - "Involve teacher training colleges/universities in the process to prepare new teachers with the tools necessary to implement competency-based education and skills for successful employment."

Item 31 received a mean score of 4.04 - "How well are we, as teacher educators, adapting our traditional content and delivery methods to preservice teachers to prepare them to participate successfully in Tech Prep programs?

Item 33 received a mean score of 4.04 - "What effect has the integration of Tech Prep systems had on schools, educators, and employers?"

Item 90 received a mean score of 4.04 - "Can we identify some *best practices models* that can serve as bench marks for schools to utilize when they begin to implement School-to Work Transition Programs?"

Research Priority Item with High Rating

Item 13 received a mean score of 4.00 - "Should teacher educators (meaning college professors) be required to spend some time each year working in the public schools a a volunteer, or as an intern in business and industry?"

Rank Order of Major Research Categories

The respondents were also asked to rank the 11 major research categories in their order of importance from 1 to 11, with the number one being the most important and the number 11 being the least important. Initially, there were 10 major research categories. However, during the second round, another one was added and the finally tabulations were made on 11 categories. The results are shown in the Table below.

Major Research Categories	Order of Importance
Research in Instruction and Curriculum Development	1st, $\bar{X} = 3.074$
Research in Staff-Development and Professional Training	2nd, $\bar{X} = 3.741$
Research in Alternative Teaching and Learning Models	3rd, $\bar{X} = 4.074$
Research in Partnerships and Linkages with Business, Industry, and Education	4th, $\bar{X} = 4.598$
Research in Work-Based Education	5th, $\bar{X} = 4.852$
Research in Perceptions and Attitudes of Tech Prep	6th, $\bar{X} = 6.481$
Research in Evaluation Methodologies and Program Assessment	7th, $\bar{X} = 7.148$
Research in Student-Related Issues	8th, $\bar{X} = 7.444$
Research on Defining Curriculum Criteria and Performance Standards for Tech Prep programs.	9th, $\bar{X} = 7.852$
Research in Marketing Strategies and Funding Resources	10th, $\bar{X} = 8.111$
Research in Policy-Related Issues	11th, $\bar{X} = 8.444$

THE SURVEY INSTRUMENTS

Round One Questionnaire - Green

Round Two Questionnaire - Pink

Round Three Questionnaire - Ivory

RESEARCH PRIORITIES IN TECH PREP TEACHER EDUCATION: A DELPHI APPROACH

Round 1 Questionnaire

DIRECTIONS: As an expert in the field of Tech Prep Education you are asked to generate several responses to the following question:

What should the research needs (priorities) for Tech Prep Teacher Education be for the next ten years?

PLEASE LIST AT LEAST FIVE SPECIFIC RESEARCH QUESTIONS OR PROBLEMS BELOW. YOU MAY LIST MORE THAN FIVE, IF YOU WISH. NO PARTICULAR ORDER IS REQUIRED.

1.

2

3.

4.

5.

Please feel free to use the back of this page for additional space, if needed.

Detach Your Completed Response Sheet and Mail in Enclosed Self-Addressed, Stamped Envelope.

Identification # _____

RESEARCH PRIORITIES IN TECH PREP EDUCATION: A DELPHI APPROACH

Round 2 Questionnaire: Part A

Dear Tech Prep Expert:

This questionnaire represents Round 2 of the three-round Delphi approach which lists specific questions and problems that Tech Prep Teacher Education should address in the next 10 years. Your comments, along with the other participants, were coded and categorized from written responses generated from Round 1. The purpose of completing Round 2 Questionnaire is two-fold. First, based on your perception, you are asked to rate each item, in Part A, by placing an **X** in the appropriate space using the assigned 5-point Likert scale. Your rating should be based on the degree of need that each item presents for research in Tech Prep Teacher Education over the next ten years. Second, in Part B you are asked to rank order the major research categories in the order of importance to you as noted on the last page of this questionnaire.

Thank you very much for your contribution to the success of this study.
Please return your questionnaire to us on or before May 12, 1994.

Research Priority Item	Your Response Place an (x) in Section Below Least Need 1 2 3 4 5 Highest Need
1. What marketing strategies for Tech Prep implementation appear to work best for the following groups: parents, students, educators, and business?	/___/___/___/___/___/
2. To what extent can a Tech Prep curriculum lead both males and females to pursue non-traditional careers for both sexes?	/___/___/___/___/___/
3. What is the cost impact and is this an obstacle to implementing Tech Prep?	/___/___/___/___/___/
4. How important is articulation between programs and what are the most useful models for articulation with local high schools, community colleges and four-year universities?	/___/___/___/___/___/
5. Identify or develop and demonstrate methods for building communication and collaboration between colleges of education and state departments of education on Tech Prep education issues.	/___/___/___/___/___/
6. What are the critical environmental factors which contribute to successful implementation of Tech-Prep programs?	/___/___/___/___/___/
7. What will business/industry personnel need to know and be able to do to participate in Tech-Prep programs?	/___/___/___/___/___/

	Research Priority Item	Your Response Place an (x) in Section Below
8.	Identify or develop counselor education pre-service programs which include an appropriate emphasis on career development, career assessment, career guidance, leadership of assessment and guidance teams, and awareness of full range of post-secondary educational options.	Least Need / 1 / 2 / 3 / 4 / 5 / Highest Need
9.	How can teacher education programs prepare teachers to continuously and effectively modify curricula in collaboration with persons who are not "educators" in the traditional sense?	/ / / / / /
10.	What are the curriculum requirements and needs for Tech Prep Teacher Education, and what are the most valuable philosophical and pedagogical foundations for Tech Prep Teacher Education Programs?	/ / / / / /
11.	Institutionalize Tech Prep into the higher education delivery system and focus instruction on data from learning styles/cognitive sciences research, and non-traditional teaching methods.	/ / / / / /
12.	Identify or develop effective means for improving the instruction in colleges of education resulting in modeling of instructional strategies and techniques appropriate for Tech Prep education.	/ / / / / /
13.	Should teacher educators (meaning college professors) be required to spend some time each year working in the public schools as a volunteer, or as an intern in business and industry?	/ / / / / /
14.	Develop a "Tech-Prep model" for general education course such as social studies, English, etc.	/ / / / / /
15.	How can teacher education programs be redesigned to ensure that teachers are competent in the use of active and diverse teaching methodologies?	/ / / / / /
16.	Tech Prep education involves the integration of academic and occupational curricula which can be accomplished in a variety of ways. Which aproach, or combination of approaches, is the most effective in terms of student achievement and faculty satisfaction?	/ / / / / /
17.	How can teacher education programs be structured to provide future teachers with an understanding of and an appreciation of technical career fields?	/ / / / / /
18.	What academic and technical competencies are needed by modern high schools and postsecondary business and technology teachers?	/ / / / / /
19.	What conditions will produce a Tech Prep program that will prevent the traps of tracking during the implementation process?	/ / / / / /
20.	To what extent does cognitive learning theory validate an applied academics teaching methodology?	/ / / / / /
21.	What techniques or models can be used to create or enhance relationships and curriculum development between and among: a) academic and vocational/ technical instructors, b) secondary and post-secondary staff, and c) educators and business/industry representatives?	/ / / / / /

	Research Priority Item	Your Response Place an (x) in Section Below
		Least Need / Highest Need
22.	Are teacher educators adequately prepared to identify innovative, effective, and economic means of integrating essential knowledge, skills, and attitudes in pre-service preparation of instructors, counselors, and administrators (educational leaders) who will serve at secondary and post-secondary levels?	/___/___/___/___/___/ 1 2 3 4 5
23.	The colleges of education in each state need to provide sufficient courses in the applied academic areas such as principles of technology, ABC, applied mathematics, applied economics and applied communications.	/___/___/___/___/___/
24.	Who determines total track content? Which school decides which courses are included in the total track?	/___/___/___/___/___/
25.	Maintaining and enhancing of the techniques used to teach the applied courses over a period of time and documentation of the success of these methods.	/___/___/___/___/___/
26.	How should Tech Prep be linked to K-9 curriculum and to four-year baccalaureate degree programs?	/___/___/___/___/___/
27.	To prepare future teachers with the mission of education as the foundation for students' further learning, citizenship, and productive employment.	/___/___/___/___/___/
28.	To prepare all future teachers to recognize the need for business/industry/ education, linkages and partnerships.	/___/___/___/___/___/
29.	Involve teacher training colleges/universities in the process to prepare new teachers with the tools necessary to implement competency-based education and skills for successful employment.	/___/___/___/___/___/
30.	What is the demand for and the needs of existing Tech Prep teachers and what should a current teacher be like with a Tech Prep certification?	/___/___/___/___/___/
31.	How well are we, as teacher educators, adapting our traditional content and delivery methods to preservice teachers to prepare them to participate successfully in Tech Prep programs?	/___/___/___/___/___/
32.	The impact of using an "applied or contextual" approach to teach mathematics and communication skills or the impact of student achievement on the applied academics.	/___/___/___/___/___/
33.	What effect has the integration of Tech-Prep systems had on schools, educators, and employers?	/___/___/___/___/___/
34.	How can university professors best be trained in the use of applied methodologies, and how should the delivery of teacher education courses be modified so that professors can appropriately model applied methodologies?	/___/___/___/___/___/
35.	What type of staff development will help teachers and schools to create practices that result in higher performances by all students?	/___/___/___/___/___/
36.	How well prepared are teachers to advise students, mentor them, and help them to see how each Tech Prep component fits with each other component in the overall program? (Are they able to support the articulation approach?)	/___/___/___/___/___/

	Research Priority Item	Your Response Place an (x) in Section Below
		Least Need / Highest Need
37.	How can teacher education programs foster the interpersonal skills teachers need to work through and around the structural barriers to curriculum integration?	/___/___/___/___/___/ 1 2 3 4 5
38.	The state department of public instruction should provide sufficient information to faculty and counselors about Tech Prep and applied academics.	/___/___/___/___/___/
39.	What evidence exists to document the effectiveness of teacher preparation in Tech Prep?	/___/___/___/___/___/
40.	What are the best Tech Prep journals/periodicals, and are there any specific for Tech Prep?	/___/___/___/___/___/
41.	What practices are most effective in preparing teachers to work with business and industry advisory committees to evaluate and improve curriculum and instructional delivery systems?	/___/___/___/___/___/
42.	What are the strategies Tech Prep teachers need to facilitate positive impact on the career development of their students?	/___/___/___/___/___/
43.	To shift the paradigm of all teaching from content-oriented learning to applied work-based contextual learning.	/___/___/___/___/___/
44.	What is the rate of apprenticeship (formal) agreements in Tech Prep and what are the effects of this plan on students?	/___/___/___/___/___/
45.	What are the academic skills needed for success at entry level, technical level, and professional level of identified career paths?	/___/___/___/___/___/
46.	To what extent do Tech Prep teachers use work-based teaching and learning strategies in their teaching methodologies, ones that are grounded in the actual competencies needed in the business sector?	/___/___/___/___/___/
47.	What are the long-range employment needs to determine types of Tech Prep programs.	/___/___/___/___/___/
48.	How can we develop effective teams of educators, counselors and industry mentors to ensure the quality and consistency of the work-based education component of the school-to-work transition program?	/___/___/___/___/___/
49.	What are the underlying principles and characteristics associated with academic disciplines to utilize applications drawn from the technological environment in ways that increase student learning?	/___/___/___/___/___/
50.	Create a handbook/collection of various strategies used by four-year institutions to validate the applied courses along with traditional courses as prerequisites for their programs.	/___/___/___/___/___/
51.	What teaching and learning styles are most appropriate for Tech Prep and adult education?	/___/___/___/___/___/
52.	What is the effect of Tech Prep on AVTS enrollment/programs?	/___/___/___/___/___/

	Research Priority Item	Your Response Place an (x) in Section Below
		Least Need / Highest Need
53.	Some states are administering funds for Tech Prep through community colleges, and some community colleges are writing the proposals and administering the funds. However, many community college do not receive any monetary incentive for this activity. Does this act as a barrier to the implementation of Tech Prep?	/___/___/___/___/___/ 1 2 3 4 5
54.	How do students learn best, and how do teachers teach best? Is real life learning more effective than school learning?	/___/___/___/___/___/
55.	What school and classroom conditions will enable 90 percent of high school youth to master more advanced academic and technical content?	/___/___/___/___/___/
56.	Learning new methodologies--contextual, co-operative integration of academic and vocational education. Learn the theory first and then practice.	/___/___/___/___/___/
57.	Provide information about site-based management, learning styles, and active learning. The lecture method in many cases is obsolete.	/___/___/___/___/___/
58.	What is the nature of Tech Prep now and what should it be like during the next 10 years?	/___/___/___/___/___/
59.	What is the level of awareness and acceptance of Tech Prep among selected populations? (implications for attracting students).	/___/___/___/___/___/
60.	What processes exist (or can be designed) to facilitate grade/course work acceptance of Tech Prep to universities?	/___/___/___/___/___/
61.	What are the attitudes of the various stakeholders (i.e., educators, parents, business/industry personnel) toward Tech Prep programs?	/___/___/___/___/___/
62.	What is Tech Prep (an illuminative study), is there a common perception? What incentives are there for public schools to devote time and energy in developing Tech Prep programs?	/___/___/___/___/___/
63.	How does the negative connotation of occupational/vocational education impact on Tech Prep?	/___/___/___/___/___/
64.	What are the primary barriers to the articulation of Tech Prep programs between public schools and community colleges?	/___/___/___/___/___/
65.	A comparison of the achievement of non-Tech Prep students versus Tech Prep students in rural and urban schools.	/___/___/___/___/___/
66.	Identify pre-service teacher education programs which provide early field experience (freshman and sophomore level) to assist with career guidance and candidate screening.	/___/___/___/___/___/
67.	What is a "Tech Prep Completer"? How many of them obtain a high school diploma, a certificate of mastery, a skill certificate, a bachelor's degree, etc.?	/___/___/___/___/___/
68.	Does cooperative learning improve student achievement and if so among what student populations?	/___/___/___/___/___/

	Research Priority Item	Your Response Place an (x) in Section Below Least Need / Highest Need 1 2 3 4 5
69.	How are states monitoring the process of students who graduate as Tech Prep majors at the secondary and postsecondary level compare with graduates at-large (a longitudinal study)?	/___/___/___/___/___/
70.	How do norm test scores of Tech Prep students compare to those of other students, categorizing by general education, Tech Prep, general career education, and traditional university bound?	/___/___/___/___/___/
71.	What is the percentage of Tech Prep students in paid work experience programs? What is the comparison of those students to general Tech Prep students?	/___/___/___/___/___/
72.	Can the early (5th Grade) establishment of a vision for success (sequential curriculum, work experience, guaranteed two year college program, job placement) break the dropout pattern of America's rural and minority learners?	/___/___/___/___/___/
73.	What instructional strategies prepare students for the constant change and problem-solving needed for the rapidly changing information age?	/___/___/___/___/___/
74.	To what extent are Tech Prep programs positively impacting secondary school dropout rates? (Effective teaching, mentoring and motivating as well as high-quality programs are important parts of this impact)?	/___/___/___/___/___/
75.	Expand student teaching to include an industry-based internship. Require student-teacher to write and teach a unit of study-module that demonstrates the practical application of the academic discipline.	/___/___/___/___/___/
76.	Who, besides the "neglected majority," is being helped through Tech Prep, and what is the level of awareness and acceptance of Tech Prep among special populations?	/___/___/___/___/___/
77.	Is there a difference in student achievement between students taught in traditional instructional settings versus applied settings and if so, among what student populations?	/___/___/___/___/___/
78.	Is there a relationship between initial job success and a student's enrollment in a Tech Prep program versus enrollment in other academic programs?	/___/___/___/___/___/
79.	The schools will need counselors who understand the college prep and Tech Prep concepts.	/___/___/___/___/___/
80.	How can Tech Prep serve the under-achieving student who may not be capable of success in the Tech Prep or college prep track?	/___/___/___/___/___/
81.	How can equitable credit be ascertained for students who switch tracks?	/___/___/___/___/___/
82.	Who are Tech Prep students, and how are they different from traditional vocational education or academic college bound students?	/___/___/___/___/___/
83.	What are the principles and practices of student evaluation in programs that fully implement integration of academic and technical content?	/___/___/___/___/___/

	Research Priority Item	Your Response Place an (x) in Section Below
		Least Need / Highest Need
84.	Evaluate the contributions of internship experiences in business/industry to the effectiveness of pre-service and in-service preparation for academic, vocational, and special education teachers for roles in Tech Prep education.	/___/___/___/___/___/ 1 2 3 4 5
85.	What are the common characteristics of effective Tech Prep Teacher Education Programs?	/___/___/___/___/___/
86.	What are the effective site-based delivery systems that help teachers, schools, and communities learn to help themselves during the reform process?	/___/___/___/___/___/
87.	What evaluation techniques are valid and effective for Tech Prep?	/___/___/___/___/___/
88.	What is the most effective way to integrate content and to actively involve teachers in the actual planning of Tech Prep programs?	/___/___/___/___/___/
89.	What consortia management strategy works best, and what organizational structure works best?	/___/___/___/___/___/
90.	Can we identify some "best practices models" that can serve as benchmarks for schools to utilize when they begin to implement School-to Work Transition Programs?	/___/___/___/___/___/
91.	Flexibility of state departments of education and state governing bodies in implementing Tech Prep programs and providing flexibility in the graduation requirements.	/___/___/___/___/___/
92.	Involve accreditation agencies in the process so the articulation of credit from one level to the next will not be hindered.	/___/___/___/___/___/
93.	What comparisons are there between what the latest NAVE report says about Tech Prep's effect and what exists during the last year of this Perkins re-authorization, since the NAVE study was based on '90-'91 and '91 -'92 data that is highly preliminary, considering that the Tech Prep Act was authorized in September, 1990?	/___/___/___/___/___/
94.	What effect on institutional governance has occurred in the "stakeholder groups" approach to Tech Prep?	/___/___/___/___/___/
95.	What new policy mechanisms are needed to forge high school community colleges and workplaces into an accelerated system of education that connects youth to career pathways?	/___/___/___/___/___/
96.	What are the problems caused by incorrectly certifying accomplishment of competencies? Do teachers or administrators set standards for Tech Prep?	/___/___/___/___/___/
97.	How extensive have Tech Prep Programs become institutionalized in the schools across the nation? What characteristics can be identified that support and hinder the institutionalizing of Tech Prep programs?	/___/___/___/___/___/
98.	What aims does Tech Prep accomplish?	/___/___/___/___/___/

Research Priorities in Tech Prep Teacher Education:
A Delphi Approach

Round 2 Questionnaire: Part B

Directions: Please review the list of major research categories and prioritize each item as it relates to a future research agenda for Tech Prep Teacher Education over the next 10 years. Please rank the research categories from 1 to 10, with the number 1 being the most important and the number 10 being the least important. In other words, which research category should be addressed first, second, third, etc.

Major Research Category	Your Rank
Research in Marketing Strategies and Funding Resources	_____
Research in Partnerships and Linkages with Business, Industry, and Education	_____
Research in Instruction and Curriculum Development	_____
Research in Staff-Development and Professional Training	_____
Research in Work-Based Education	_____
Research in Alternative Teaching and Learning Strategies/Models	_____
Research in Perceptions and Attitudes of Tech Prep Education	_____
Research in Student-Related Issues	_____
Research in Evaluation Methodologies and Program Assessment	_____
Research in Policy-Related Issues	_____

You may list other Research Categories on a separate sheet

Please return your questionnaire to us on or before May 12, 1994.

Your contributions provide the catalyst to the success of this national study and for that we are extremely grateful.

Edgar I. Farmer and Li-Shyung Hwang

Identification # _____

RESEARCH PRIORITIES IN TECH PREP EDUCATION: A DELPHI APPROACH

Round 3 Questionnaire: Part A

Dear Tech Prep Expert:

This questionnaire represents the third and final round of the Delphi approach to determine research priorities in Tech Prep Teacher Education. Round 3 requires you to review each Round 2 responses and contrast it using group consensus data. Your Round 2 responses have been tabulated to include the following information: (a) interquartile range (middle 50% of all responses), (b) mean, and (c) median. The ratings you initially made for Round 2 are identified with a blue dot ( ). Based on the information provided, you may keep your initial ratings or change any items you wish. Please explain your reason(s) for the new rating of any research item that is outside the group consensus (interquartile range). An explanation is requested only when the rating falls outside of the interquartile range.

Thank you very much for your contribution to the success of this study.
Please return your questionnaire to us on or before June 15, 1994.

Research Priority Item	QT	Mdn	Mean	Your Response Place an (x) in Section Below Least Need 1 2 3 4 5 Highest Need
1. What marketing strategies for Tech Prep implementation appear to work best for the following groups: parents, students, educators, and business?	3 -4	4	3.47	/___/___/___/___/___/
2. To what extent can a Tech Prep curriculum lead both males and females to pursue non-traditional careers for both sexes?	3 - 4	3	3.17	/___/___/___/___/___/
3. What is the cost impact and is this an obstacle to implementing Tech Prep?	3 - 4	3	3.3	/___/___/___/___/___/
4. How important is articulation between programs and what are the most useful models for articulation with local high schools, community colleges and four-year universities?	4 - 5	5	4.2	/___/___/___/___/___/
5. Identify or develop and demonstrate methods for building communication and collaboration between colleges of education and state departments of education on Tech Prep education issues.	3 - 5	4	3.77	/___/___/___/___/___/
6. What are the critical environmental factors which contribute to successful implementation of Tech-Prep programs?	3 - 5	4	3.6	/___/___/___/___/___/
7. What will business/industry personnel need to know and be able to do to participate in Tech-Prep programs?	4 - 5	4	4.07	/___/___/___/___/___/

Research Priority Item	QT	Mdn	Mean	Your Response Place an (x) in Section Below Least Need 1 2 3 4 5 Highest Need
8. Identify or develop counselor education pre-service programs which include an appropriate emphasis on career development, career assessment, career guidance, leadership of assessment and guidance teams, and awareness of full range of post-secondary educational options.	4 - 5	4	4.17	___/___/___/___/___
9. How can teacher education programs prepare teachers to continuously and effectively modify curricula in collaboration with persons who are not "educators" in the traditional sense?	4 - 5	5	4.2	___/___/___/___/___
10. What are the curriculum requirements and needs for Tech Prep Teacher Education, and what are the most valuable philosophical and pedagogical foundation for Tech Prep Teacher Education Programs?	4 - 5	5	4.1	___/___/___/___/___
11. Institutionalize Tech Prep into the higher education delivery system and focus instruction on data from learning styles/cognitive sciences research, and non-traditional teaching methods.	4 - 5	5	4.43	___/___/___/___/___
12. Identify or develop effective means for improving the instruction in colleges of education resulting in modeling of instructional strategies and techniques appropriate for Tech Prep education.	3.25-5	5	4.1	___/___/___/___/___
13. Should teacher educators (meaning college professors) be required to spend some time each year working in the public schools as a volunteer, or as an intern in business and industry?	3 - 5	4	3.93	___/___/___/___/___
14. Develop a "Tech-Prep model" for general education course such as social studies, English, etc.	2 - 4	3	2.9	___/___/___/___/___
15. How can teacher education programs be redesigned to ensure that teachers are competent in the use of active and diverse teaching methodologies?	4 - 5	5	4.23	___/___/___/___/___
16. Tech Prep education involves the integration of academic and occupational curricula which can be accomplished in a variety of ways. Which aproach, or combination of approaches, is the most effective in terms of student achievement and faculty satisfaction?	4 - 5	4	3.93	___/___/___/___/___
17. How can teacher education programs be structured to provide future teachers with an understanding of and an appreciation of technical career fields?	3.25-5	4	4.13	___/___/___/___/___
18. What academic and technical competencies are needed by modern high schools and postsecondary business and technology teachers?	3 - 5	4	3.93	___/___/___/___/___
19. What conditions will produce a Tech Prep program that will prevent the traps of tracking during the implementation process?	2.25-4	3	3.17	___/___/___/___/___
20. To what extent does cognitive learning theory validate an applied academics teaching methodology?	3-4.75	4	3.63	___/___/___/___/___
21. What techniques or models can be used to create or enhance relationships and curriculum development between and among: a) academic and vocational/technical instructors, b) secondary and post-secondary staff, and c) educators and business/industry representatives?	4 - 5	5	4.33	___/___/___/___/___

Research Priority Item	QT	Mdn	Mean	Your Response Place an (x) in Section Below Least Need 1 2 3 4 5 Highest Need
22. Are teacher educators adequately prepared to identify innovative, effective, and economic means of integrating essential knowledge, skills, and attitudes in pre-service preparation of instructors, counselors, and administrators (educational leaders) who will serve at secondary and post-secondary levels?	3 - 5	4	3.87	/ / / / / /
23. The colleges of education in each state need to provide sufficient courses in the applied academic areas such as principles of technology, ABC, applied mathematics, applied economics and applied communications.	3 - 5	4	3.77	/ / / / / /
24. Who determines total track content? Which school decides which courses are included in the total track?	1 - 4	3	2.63	/ / / / / /
25. Maintaining and enhancing of the techniques used to teach the applied courses over a period of time and documentation of the success of these methods.	3 - 5	4	3.77	/ / / / / /
26. How should Tech Prep be linked to K-9 curriculum and to four-year baccalaureate degree programs?	3 - 5	4	3.57	/ / / / / /
27. To prepare future teachers with the mission of education as the foundation for students' further learning, citizenship, and productive employment.	- 4	3	2.93	/ / / / / /
28. To prepare all future teachers to recognize the need for business/industry/ education, linkages and partnerships.	4 - 5	4	4.03	/ / / / / /
29. Involve teacher training colleges/universities in the process to prepare new teachers with the tools necessary to implement competency-based education and skills for successful employment.	4 - 5	4	4	/ / / / / /
30. What is the demand for and the needs of existing Tech Prep teachers and what should a current teacher be like with a Tech Prep certification?	3 - 4	4	3.37	/ / / / / /
31. How well are we, as teacher educators, adapting our traditional content and delivery methods to preservice teachers to prepare them to participate successfully in Tech Prep programs?	3 - 5	4	4	/ / / / / /
32. The impact of using an "applied or contextual" approach to teach mathematics and communication skills or the impact of student achievement on the applied academics.	4 - 5	4	4.03	/ / / / / /
33. What effect has the integration of Tech-Prep systems had on schools, educators, and employers?	3 - 5	4	3.9	/ / / / / /
34. How can university professors best be trained in the use of applied methodologies, and how should the delivery of teacher education courses be modified so that professors can appropriately model applied methodologies?	3.25- 5	4	4.03	/ / / / / /
35. What type of staff development will help teachers and schools to create practices that result in higher performances by all students?	4 - 5	5	4.37	/ / / / / /
36 How well prepared are teachers to advise students, mentor them, and help them to see how each Tech Prep component fits with each other component in the overall program? (Are they able to support the articulation approach?)	4 - 5	4	3.97	/ / / / / /

Research Priority Item	QT	Mdn	Mean	Your Response Place an (x) in Section Below Least Need 1 2 3 4 5 Highest Need
37. How can teacher education programs foster the interpersonal skills teachers need to work through and around the structural barriers to curriculum integration?	3 - 4	3.5	3.37	___/___/___/___/___/
38. The state department of public instruction should provide sufficient information to faculty and counselors about Tech Prep and applied academics.	1.25-3	3	2.63	/___/___/___/___/___/
39. What evidence exists to document the effectiveness of teacher preparation in Tech Prep?	3-4.75	4	3.57	/___/___/___/___/___/
40. What are the best Tech Prep journals/periodicals, and are there any specific for Tech Prep?	1 - 3	3	2.37	/___/___/___/___/___/
41. What practices are most effective in preparing teachers to work with business and industry advisory committees to evaluate and improve curriculum and instructional delivery systems?	3 - 5	4	3.83	/___/___/___/___/___/
42. What are the strategies Tech Prep teachers need to facilitate positive impact on the career development of their students?	3 - 4	4	3.57	/___/___/___/___/___/
43. To shift the paradigm of all teaching from content-oriented learning to applied work-based contextual learning.	4 - 5	4	4.03	/___/___/___/___/___/
44. What is the rate of apprenticeship (formal) agreements in Tech Prep and what are the effects of this plan on students?	2 - 4	3	2.83	/___/___/___/___/___/
45. What are the academic skills needed for success at entry level, technical level, and professional level of identified career paths?	3 - 5	4	3.73	/___/___/___/___/___/
46. To what extent do Tech Prep teachers use work-based teaching and learning strategies in their teaching methodologies, ones that are grounded in the actual competencies needed in the business sector?	3 - 5	4	3.8	/___/___ ___/___/___/
47. What are the long-range employment needs to determine types of Tech Prep programs.	3 - 4	3	3.3	/___/___/___/___/___/
48. How can we develop effective teams of educators, counselors and industry mentors to ensure the quality and consistency of the work-based education component of the school-to-work transition program?	3 - 5	4	4.03	/___/___/___/___/___/
49. What are the underlying principles and characteristics associated with academic disciplines to utilize applications drawn from the technological environment in ways that increase student learning?	3 - 4	3	3.4	/___/___/___/___/___/
50. Create a handbook/collection of various strategies used by four-year institutions to validate the applied courses along with traditional courses as prerequisites for their programs.	2 - 4	3	3.1	/___/___/___/___/___/
51. What teaching and learning styles are most appropriate for Tech Prep and adult education?	3- 5	4	3.73	/___/___/___/___/___/
52. What is the effect of Tech Prep on AVTS enrollment/programs?	2 - 3	3	2.7	/___/___/___/___/___/

Research Priority Item	QT	Mdn	Mean	Your Response Place an (x) in Section Below Least Need 1 2 3 4 5 Highest Need
53. Some states are administering funds for Tech Prep through community colleges, and some community colleges are writing the proposals and administering the funds. However, many community college do not receive any monetary incentive for this activity. Does this act as a barrier to the implementation of Tech Prep?	1 - 3	2	2.47	
54. How do students learn best, and how do teachers teach best? Is real life learning more effective than school learning?	3 - 5	4	3.7	
55. What school and classroom conditions will enable 90 percent of high school youth to master more advanced academic and technical content?	4 5	4	4.23	
56. Learning new methodologies--contextual, co-operative integration of academic and vocational education. Learn the theory first and then practice.	2 - 4	3	3.03	
57. Provide information about site-based management, learning styles, and active learning. The lecture method in many cases is obsolete.	3-4.75	4	3.43	
58. What is the nature of Tech Prep now and what should it be like during the next 10 years?	3 - 4	3	3.17	
59. What is the level of awareness and acceptance of Tech Prep among selected populations? (implications for attracting students).	3 - 4	3	3.33	
60. What processes exist (or can be designed) to facilitate grade/course work acceptance of Tech Prep to universities?	3-4.75	3.5	3.6	
61. What are the attitudes of the various stakeholders (i.e., educators, par ents, business/industry personnel) toward Tech Prep programs?	3 - 4	3	3.4	
62. What is Tech Prep (an illuminative study), is there a common perception? What incentives are there for public schools to devote time and energy in developing Tech Prep programs?	2 - 4	3	3.17	
63. How does the negative connotation of occupational/vocational education impact on Tech Prep?	2 - 3	3	2.77	
64. What are the primary barriers to the articulation of Tech Prep programs between public schools and community colleges?	3-4.75	4	3.5	
65. A comparison of the achievement of non-Tech Prep students versus Tech Prep students in rural and urban schools.	3 - 5	4	3.7	
66. Identify pre-service teacher education programs which provide early field experience (freshman and sophomore level) to assist with career guidance and candidate screening.	3 - 4	3.5	3.3	
67. What is a "Tech Prep Completer"? How many of them obtain a high school diploma, a certificate of mastery, a skill certtificate, a bachelor's degree, etc.?	3 - 4	3	3.37	
68. Does cooperative learning improve student achievement and if so among what student populations?	3 - 4	4	3.67	

Research Priority Item	QT	Mdn	Mean	Your Response Place an (x) in Section Below Least Need 1 2 3 4 5 Highest Need
69 How are states monitoring the process of students who graduate as Tech Prep majors at the secondary and postsecondary level compare with graduates at-large (a longitudinal study)?	3 - 5	4	3 7	/___/___/___/___/___/
70. How do norm test scores of Tech Prep students compare to those of other students, categorizing by general education, Tech Prep, general career education, and traditional university bound?	3 - 5	4	3.9	/___/___/___/___/___/
71 What is the percentage of Tech Prep students in paid work experience programs? What is the comparison of those students to general Tech Prep students?	2 - 3	3	2.76	/___/___/___/___/___/
72. Can the early (5th Grade) establishment of a vision for success (sequen tial curriculum, work experience, guaranteed two year college program, job placement) break the dropout pattern of America's rural and minority learners?	3 - 4	3	3.3	/___/___/___/___/___/
73. What instructional strategies prepare students for the constant change and problem-solving needed for the rapidly changing information age?	3 - 5	4	3.67	/___/___/___/___/___/
74. To what extent are Tech Prep programs positively impacting secondary school dropout rates? (Effective teaching, mentoring and motivating as well as high-quality programs are important parts of this impact)?	3 - 4	4	3.57	/___/___/___/___/___/
75. Expand student teaching to include an industry-based internship. Require student-teacher to write and teach a unit of study-module that demonstrates the practical application of the academic discipline.	4 - 5	4	4.07	/___/___/___/___/___/
76. Who, besides the "neglected majority," is being helped through Tech Prep, and what is the level of awareness and acceptance of Tech Prep among special populations?	3-4.75	4	3.57	/___/___/___/___/___/
77. Is there a difference in student achievement between students taught in traditional instructional settings versus applied settings and if so, among what student populations?	3.25-5	4	4.03	/___/___/___/___/___/
78. Is there a relationship between initial job success and a student's enrollment in a Tech Prep program versus enrollment in other academic programs?	3 - 4	4	3.67	/___/___/___/___/___/
79. The schools will need counselors who understand the college prep and Tech Prep concepts.	3 - 4	4	3.4	/___/___/___/___/___/
80. How can Tech Prep serve the under-achieving student who may not be capable of success in the Tech Prep or college prep track?	1.25-4	3	2.87	/___/___/___/___/___/
81. How can equitable credit be ascertained for students who switch tracks?	2 - 4	3	2.97	/___/___/___/___/___/
82. Who are Tech Prep students, and how are they different from traditional vocational education or academic college bound students?	2 - 4	3	3.13	/___/___/___/___/___/
83. What are the principles and practices of student evaluation in programs that fully implement integration of academic and technical content?	3 - 5	4	3 87	/___/___/___/___/___/

Research Priority Item	QT	Mdn	Mean	Your Response Place an (x) in Section Below Least Need 1 2 3 4 5 Highest Need
84. Evaluate the contributions of internship experiences in business/industry to the effectiveness of pre-service and in-service preparation for academic, vocational, and special education teachers for roles in Tech Prep education.	3 - 5	4	3.73	/ / / / /
85. What are the common characteristics of effective Tech Prep Teacher Education Programs?	2 - 5	3.5	3.4	/ / / / /
86. What are the effective site-based delivery systems that help teachers, schools, and communities learn to help themselves during the reform process?	3 - 5	4	3.6	/ / / / /
87. What evaluation techniques are valid and effective for Tech Prep?	3 - 5	4	3.8	/ / / / /
88. What is the most effective way to integrate content and to actively involve teachers in the actual planning of Tech Prep programs?	3 - 5	4	3.67	/ / / / /
89. What consortia management strategy works best, and what organizational structure works best?	2 - 4	3	2.87	/ / / / /
90. Can we identify some "best practices models" that can serve as bench marks for schools to utilize when they begin to implement School-to Work Transition Programs?	3 - 5	4	3.83	/ / / / /
91. Flexibility of state departments of education and state governing bodies in implementing Tech Prep programs and providing flexibility in the graduation requirements.	2 - 4	3	3.03	/ / / / /
92. Involve accreditation agencies in the process so the articulation of credit from one level to the next will not be hindered.	2.25-4	3	3.23	/ / / / /
93. What comparisons are there between what the latest NAVE report says about Tech Prep's effect and what exists during the last year of this Perkins re-authorization, since the NAVE study was based on '90-'91 and '91-'92 data that is highly preliminary, considering that the Tech Prep Act was authorized in September, 1990?	1.25-3.75	3	2.7	/ / / / /
94. What effect on institutional governance has occurred in the "stakeholder groups" approach to Tech Prep?	2 - 3	3	2.63	/ / / / /
95. What new policy mechanisms are needed to forge high school community colleges and workplaces into an accelerated system of education that connects youth to career pathways?	3 - 4	4	3.57	/ / / / /
96. What are the problems caused by incorrectly certifying accomplishment of competencies? Do teachers or administrators set standards for Tech Prep?	2 - 3	3	2.77	/ / / / /
97. How extensive have Tech Prep Programs become institutionalized in the schools across the nation? What characteristics can be identified that support and hinder the institutionalizing of Tech Prep programs?	2-4.75	3	3.33	/ / / / /
98. What aims does Tech Prep accomplish?	2 - 4	3	3.27	/ / / / /

Research Priorities in Tech Prep Teacher Education: A Delphi Approach

Round 3 Questionnaire: Part B

Directions: Please review the major research categories and note your previous ranking as well as the group ranking and mean for each item. As you review this information, please rank the research categories again in the order of importance to Tech Prep Teacher Education. The categories should be ranked from 1 to 11, with the number 1 being the most important and the number 11 being the least important. In other words, which research category should be addressed first, second, third, etc.

Major Research Category	Group Mean	Group Rank	Your Previous Ranking	Your Final Ranking
Research in Marketing Strategies and Funding Resources	7.23	9	_____	_____
Research in Partnerships and Linkages with Business, Industry, and Education	4.33	4	_____	_____
Research in Instruction and Curriculum Development	3.63	1	_____	_____
Research in Staff-Development and Professional Training	3.97	2	_____	_____
Research in Work-Based Education	4.57	5	_____	_____
Research in Alternative Teaching and Learning Strategies/Models	4.17	3	_____	_____
Research in Perceptions and Attitudes of Tech Prep Education	6.17	6	_____	_____
Research in Student-Related Issues	6.87	8	_____	_____
Research in Evaluation Methodologies and Program Assessment	6.63	7	_____	_____
Research in Policy-Related Issues	7.43	10	_____	_____
* Research on defining curriculum criteria (academic and technical) and performance standards for Tech Prep programs				_____

** This category was proposed during the last round and represents a new addition to Round 3.*

Please return your questionnaire to us on or before June 15, 1994.

Your contributions provide the catalyst to the success of this national study and for that we are extremely grateful.

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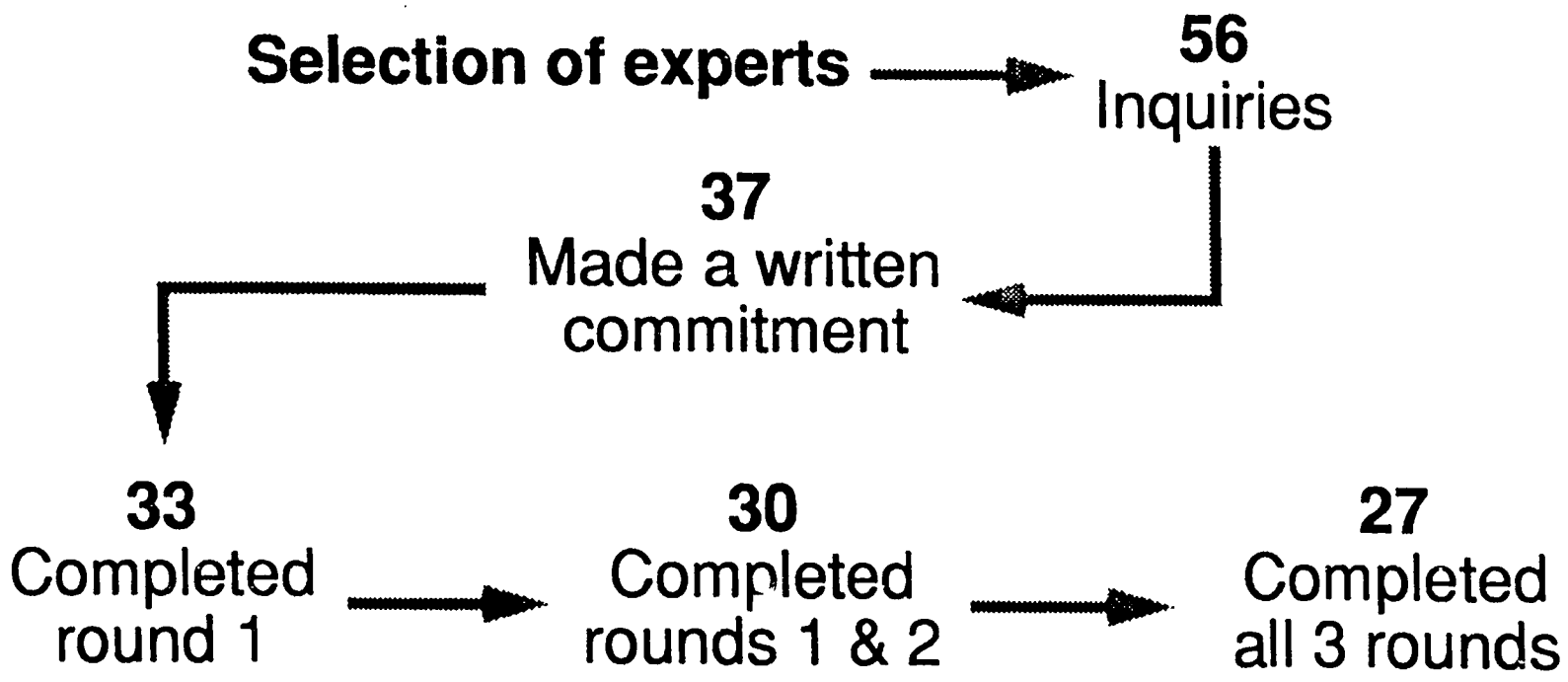
Procedure


Selection of experts
56
Inquiries
37
Made a written commitment
33
Completed round 1
30
Completed rounds 1 & 2
27
Completed all 3 rounds

Location of Tech Prep Experts

AL	DC	LA	NY	SC
AR	GA	MD	OK	TN
AZ	ID	NC	OH	TX
CA	IL	NJ	OR	VA
CO	KS	NM	PA	WI

25 states represented in the study (based on 56 inquires)