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ABSTRACT

A 2-year project was undertaken to develop performance standards for vocational and applied technology education in Texas. During the first project year, background research on performance standards in vocational and applied technology education was conducted and model performance standards for selected vocational programs were delineated. During the second project year, the process of developing performance standards for sequences of vocational courses preparing students for 22 priority and/or emerging occupations was continued. In addition, course-specific core performance standards were developed for those vocational courses in which they were needed, and a feasibility study of the new performance standards was conducted in a sample of 12 Texas school districts. A data-gathering instrument to be used by local vocational administrators in collecting data for their required district evaluations was developed. (Appendixes include an abstract of the 1991-1992 project work plan, advisory committee minutes, competency lists, task list summaries, a prototype data collection instrument, an occupations worksheet, tables matching existing Student Occupational Competency Achievement Tests to essential elements for specific courses, and project progress reports. Contains 26 references and 14 tables.) (MN)

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FINAL REPORT

PERFORMANCE STANDARDS FOR VOCATIONAL AND APPLIED TECHNOLOGY EDUCATION

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Section 1. PROBLEM AREA

Anticipating that the Carl D. Perkins Act of 1990 would include new and more demanding requirements for evaluating vocational and applied technology education programs, the Texas Education Agency (TEA) granted funds to the Extension Instruction and Materials Center (EIMC) at The University of Texas at Austin to conduct a two-year project to research and develop measurable and objective criteria to assess the quality and performance of vocational and applied technology education in secondary schools in Texas. The project *Performance Standards for Vocational and Applied Technology Education* was initiated July 1, 1990. The Carl D. Perkins Vocational and Applied Technology Education Act Amendments of 1990, enacted in September 1990, authorizes Federal assistance for vocational education through Fiscal Year 1995. The Act makes several significant amendments to focus the Federal funds on improving vocational education and, in particular, on improving education and services for members of special populations, including disabled and disadvantaged individuals.[1]

Requirements of the Carl D. Perkins Act of 1990

Section 115 of the Perkins Act of 1990 is entitled "State and Local Standards and Measures." It requires development and implementation of a statewide system of core standards and measures of performance before July 1992. The system must include (1) measures of learning and competency gains, including student progress in the achievement of basic and more advanced academic skills; (2) one or more measures of performance, which shall include only--(A) competency attainment; (B) job or work skill attainment or enhancement including student progress in achieving occupational skills necessary to obtain employment in the field for which the student has been prepared; (C) retention in school or completion of secondary school or its equivalent; and (D) placement into additional training or education, military service, or employment; (3) incentives or adjustments that are--(A) designed to encourage service to targeted groups or special populations; and (B) for each student, consistent with the student's individualized education program developed under section 614(a)(5) of the Education of the Handicapped Act, where appropriate; and (4) procedures for using existing resources and methods developed in other programs receiving Federal assistance.

> *Each State board receiving funds under this Act shall develop and implement a statewide system of core standards and measures of performance for secondary and postsecondary vocational education programs.*
>
> ***Perkins Act of 1990, Sec. 115***

Development of the statewide system is to take into consideration standards and measures developed under job opportunities and basic skills training programs that meet

the requirements of section 402(a)(19) of the Social Security Act and standards described under Section 106 of the Job Training Partnership Act (JTPA). For evaluating the performance of youth programs, these standards and measures include (A) placement in unsubsidized employment; (B) retention in employment; (C) increase in earnings; (D) reduction in number of individuals and families receiving cash welfare payments; (E) attainment of recognized employment competencies; (F) elementary, secondary, and postsecondary school completion or the equivalent thereof, and (G) enrollment in other training programs or apprenticeships or enlistment in the Armed Forces.

Section 111 of the Perkins Act identifies special populations and targeted groups. It also describes related data gathering and reporting requirements, several of which could be advantageously addressed in the statewide system of standards and measures. Data are to be gathered, analyzed, and disseminated on the adequacy and effectiveness of vocational education programs in meeting the education and employment needs of women (including displaced homemakers and single heads of households) and to ensure that needs of *women and men* for training in nontraditional jobs are met. States also are charged with identifying the number of *students with handicaps* enrolled in vocational programs and assuring that individuals with handicaps are receiving vocational education services. The number of *economically disadvantaged students* is to be identified and arrangements made to ensure that needs of such students are met. Grant recipients must also ensure that number of *students with limited English proficiency* is identified and that needs of such students for participation in vocational and applied technology education programs are being met.

To ensure that students have opportunities to participate in programs that prepare them to enter employment, Section 111 instructs States to establish a limited number of technical committees to develop an inventory of skills needed for entry, retention, and advancement in occupational areas taught in the State. This inventory, which in Texas is maintained by the State Occupational Information Coordinating Committee (SOICC), is clearly germane to the development and implementation of standards and measures regarding job or work skill attainment or enhancement.

Section 113 of the Perkins Act provides additional information about expected performance of vocational and applied technology education programs and, by implication, provides guidance for developing and implementing appropriate standards and measures of performance. Part (a)(3)(B) of this section says that vocational education programs should provide students with (i) strong experience in and understanding of all aspects of the industry the students are preparing to enter (including planning, management, finances, technical and production skills,

> *Each recipient of financial assistance under part C of title II shall annually evaluate the effectiveness of the program conducted with assistance under this Act based on the standards and measures...*
>
> ***Perkins Act of 1990, Sec. 117***

underlying principles of technology, labor and community issues, and health, safety, and environmental issues; and (ii) strong development and use of problem-solving skills and basic and advanced academic skills (including skills in the areas of mathematics, reading, writing, science, and social studies) in a technological setting.

> *Based on the standards and measures, school districts shall: (A) identify and adopt strategies to overcome barriers for individuals who are members of special populations; (B) evaluate progress of individuals who are members of special populations; and (C) evaluate progress in providing students with strong experience in and understanding of all aspects of the industry they are preparing to enter.*
>
> ***Perkins Act of 1990, Sec. 117***

Section 117 of the Perkins Act indicates how the system of statewide standards and measures of vocational and applied technology education programs is to be used. Each recipient of financial assistance for secondary vocational education programs under basic state grants for vocational education (Part C, Title II) is to annually evaluate the effectiveness of the programs conducted with assistance under the Act based on the standards and measures developed as required by Section 115. The annual evaluation is to (1) review programs, with the full and informed participation of representatives of individuals who are members of special populations to (A) identify and adopt strategies to overcome any barriers which are resulting in lower rates of access to vocational education programs or success in such programs for individuals who are members of special populations; (B) evaluate the progress of individuals who are members of special populations in vocational education programs assisted under the Act; and (2) evaluate the progress of vocational education programs assisted under the Act in providing students with strong experience in and understanding of all aspects of the industry the students are preparing to enter. If the evaluation shows that the recipient of financial assistance under the Act is not making progress in meeting the standards, the recipient is to develop a local plan, in consultation with teachers, parents, and students concerned, for program improvement for the succeeding school year.

In order to meet the requirements for developing and implementing a statewide system of standards and measures of performance, the work plan for this project specified that 1990-1991 would be dedicated to conducting background research on performance standards and to delineating model performance standards for selected vocational and applied technology education programs. Objectives for 1991-1992 were to (1) conduct a feasibility study in 12 school districts of core performance standards developed during the first year of the project and (2) continue the development of standards for specific sequences of courses in vocational and applied technology education. During the summer of 1990, project staff initiated a literature review and a mailed survey of other state education agencies in order to develop a knowledge base from which to generate content and format for standards and measures of performance for secondary programs. In the fall of 1990, a General Advisory Committee was

convened to oversee and guide the project. This committee, constituted of representatives from private and public industry, school districts, postsecondary institutions, the State council on vocational education, and directors of vocational and applied technology education programs at the TEA, determined that the standards should be developed in two tiers: (1) "core" standards to address performance issues relevant across programs and (2) "course specific" standards to supplement the core as appropriate. At the close of the first year, the project had produced an annotated bibliography of key reference materials, a briefing on results of the survey of other state education agencies, and a preliminary draft of core standards. As these initial products were being developed, other important things were happening that influenced the direction and shape of this project.

Expectations for America 2000: An Education Strategy

In April 1991, the President of the United States announced *AMERICA 2000: An Education Strategy* to move communities toward achievement of National Education Goals adopted by the President and the Governors in 1990. Increased accountability is one part of the strategy with specific emphasis on development of standards that "incorporate both knowledge and skills to ensure that, when they leave school, young Americans are prepared for further study and the work force."[2] A new nationwide examination system will be tied to the standards in English, mathematics, science, history, and geography. Congress will be asked to authorize a National Assessment of Educational Progress to collect state-level data in grades four, eight, and twelve beginning in 1994. Colleges will be urged to use the American Achievement Tests in admissions and employers will be urged to pay attention to them in hiring.

> *Standards will be developed...[to] represent what young Americans need to know and be able to do if they are to live and work successfully in today's world.*
>
> *AMERICA 2000: An Education Strategy*

Secretary's Commission on Achieving Necessary Skills (SCANS)

In support of the education strategy for America 2000, the U.S. Department of Labor published in June 1991 the first of a series of reports from the Secretary's Commission on Achieving Necessary Skills (SCANS).[3] The commission is charged with examining what work requires of schools with specific attention to (1) defining skills required to enter employment, (2) proposing acceptable levels of proficiency, (3) suggesting effective ways to assess proficiency, and (4) developing a dissemination strategy for the nation's schools, businesses, and homes. In the first report, the SCANS

presented its findings regarding skills needed for employment and presented a proposal for acceptable levels of proficiency. They concluded from their investigations that *workplace know-how* has two elements: *competencies* and a *foundation.*

The competencies, now commonly referred to as SCANS competencies, include (1) **Resources** -- allocating time, money, materials, space, and staff; (2) **Interpersonal Skills** -- working in teams, teaching others, serving customers, leading, negotiating, and working well with people from culturally diverse backgrounds; (3) **Information** -- acquiring and evaluating data, organizing and maintaining files, interpreting and communicating, and using computers to process information; (4) **Systems** -- understanding social, organizational, and technological systems, monitoring and correcting performance, and designing or improving systems; and (5) **Technology** -- selecting equipment and tools, applying technology to specific tasks, and maintaining and troubleshooting technologies.

The foundation for workplace know-how includes (1) **Basic Skills** -- reading, writing, arithmetic and mathematics, speaking, and listening; (2) **Thinking Skills** -- thinking creatively, making decisions, solving problems, seeing things in the mind's eye, knowing how to learn, and reasoning; and (3) **Personal Qualities** -- individual responsibility, self-esteem, sociability, self-management, and integrity.

> *Workplace know-how has two parts: competence and a foundation of skills and personal qualities...This know-how will be important to those who will be developing the World Class Standards for education performance called for...in AMERICA 2000.*
>
> *SCANS Report, June 1991*

The proficiency scale proposed by the SCANS for workplace know-how has as its lowest level the designation of "preparatory" (suitable only for unskilled work). Succeeding levels are "work ready," "intermediate," "advanced," and "specialist" (suitable for jobs requiring special expertise). Proficiency levels for the SCANS competencies would be assessed in grades 8 and 12. The aim of these proposals, according to the SCANS, is to promote the development and use of assessment strategies that can provide the basis for a new kind of high school credential certifying that the competencies have been acquired.

These recommendations build on those made by the authors of *America's Choice: High Skills or Low Wages.*[4] In order to broaden the options for enabling young people to achieve the high skills needed in the workplace, it was recommended that standards be established to award technical and professional certificates for occupations that do not require a baccalaureate degree. A "Certificate of Initial Mastery" would be awarded when the student demonstrates mastery of foundation skills and qualities (e.g., attaining the standards set for the core subjects American Achievement Tests proposed for America 2000). When they have mastered SCANS competencies and specific

occupational skills, students can be certified "work ready." Students who complete the base certifications early in their schooling can start working on advanced certifications--either in schools and colleges or in workplace training sites.

The SCANS has committed to working with the U. S. Departments of Labor and Education to spearhead a public-private partnership to develop voluntary standards for all industries and link them to secondary school-based instruction, assessment, and certification of competencies as is called for in the America 2000 education strategy. Preliminary work toward this end already has been completed. In the report entitled *Skills and Tasks for Jobs* published by the SCANS in February 1992, the Commission identifies SCANS competencies and foundations for 50 jobs.[5] The report describes how the skills and tasks were determined and provides examples of how the prioritized lists can be used in developing high school curricula to enable students to achieve necessary skills.

In its final report, *Learning a Living: A Blueprint for High Performance*, the SCANS emphasizes the need for a rigorous performance-based assessment system.[6] The Commission recommends that the system be education-based and nation-wide to permit educational institutions to certify levels of proficiency in workplace know-how that their students have achieved. The Commission did not, however, make recommendations about specific content or format for student assessment.

Quality Work Force Planning in Texas

Concurrent with the national movement toward cooperative endeavor to reform public education, new policies and programs are being established in Texas to (1) ensure excellence and equity in education, and (2) guarantee that the local work force has the high levels of skill that are demanded for productivity to the year 2000 and beyond. These actions have direct impact on the effort to develop and implement a statewide system of standards and measures of performance for vocational and applied technology education in secondary schools.

> *Quality Work Force Planning is the crucial link that must be established between identifying employer needs and ensuring that individuals who complete vocational-technical education and training programs are prepared for employment in the year 2000 and beyond.*
>
> ***Tri-agency Initiative, September 1990***

In September 1990, a document entitled *Texas Quality Work Force Planning* was published to inform the public and to serve as a guide for a tri-agency initiative by TEA, the Texas Higher Education Coordinating Board, and the Texas Department of Commerce to initiate and manage cooperative planning at local and state levels.[7] This program provides a crucial link between identifying employer needs and

ensuring that individuals who complete vocational-technical education and training programs are prepared for employment in the year 2000 and beyond. The anticipated outcome is an integrated service delivery system that promotes cooperation, communication, and the sharing of ideas, methods, and resources to (1) link education and training with regional needs of business and industry, (2) reinforce economic development by producing a quality work force; (3) increase the efficiency and cost effectiveness of education and training by matching programs to changes in labor market demands; and (4) encourage flexible and responsive delivery systems which will provide equal access for the region's population. The State Plan for Vocational and Applied Technology Education for Fiscal Years 1992-1994 cites the activities of regional Quality Work Force Planning Committees as means for increasing efficiency and cost effectiveness of delivering occupational education and training for jobs that are and will be available in Texas.[8]

Development of the Academic Excellence Indicator System (AEIS)

In January 1991 a specially appointed advisory committee submitted its recommendations of a set of academic excellence indicators to the State Board of Education. The Board is directed in sections 21.753 and 21.7531 of the Texas Education Code to adopt a set of indicators of the quality of learning on a campus and other performance standards for purposes of evaluation, accreditation, and determination of exemplary status. Paragraph 17 of section 21.753 says that the criteria for evaluating performance of school districts must address the quality and effectiveness of the districts' vocational education programs.

> *The State Board of Education...shall adopt a set of indicators of the quality of learning on a campus and other performance standards...*
>
> ***Texas Education Code, Section 21.7531***

The set of indicators adopted by the Board in 1991 are (1) results of criterion-referenced test of academic skills; (2) results of norm-referenced test of academic skills; (3) results of academic skills test administered to students entering college in Texas; (4) results on Scholastic Aptitude Test and American College Test; (5) one-year high school graduation rate; (6) enrollment in advanced courses; (7) student attendance; (8) dropout rate; (9) percent of seniors receiving "advanced" or "advanced with honors" seals affixed to transcripts; and (10) post-graduate performance in the workplace.

In July 1991 the Board requested assistance from the Texas Council on Vocational Education in identifying criteria to measure the performance of high school graduates in the workplace. As a result of its study, the Council prepared six recommendations and presented them to the Board in a report published in October 1991 entitled "Demanding Excellence, Rewarding Quality."[9] These six

recommendations, which were accepted by the Board in February 1992, are (1) expand the postgraduate performance indicator to include employment status, earnings, postsecondary enrollments, completion of "2+2" programs, degrees, and certificates; (2) include a set of surveys which measure employer, postsecondary, and student satisfaction; (3) include longitudinal measurement of post-graduate performance; (4) take advantage of data base systems being used by other states (e.g., Unemployment Insurance Wage Record System); (5) expand the indicators to include a measure of personal management skills and competencies; and (6) use Quality Work Force Planning Committees to conduct employer surveys and gather information not derived through a data base search.

The Council also noted that standards for occupational skills are different for different occupations. Observing that the current indicators do not assess attainment of specific occupational skills, the Council proposed that "if completion of a 'Tech Prep' program was added to the list of indicators, the quality of occupational preparation could be implied."[10] The list of indicators presented to the Board by the Commissioner of Education in January 1992 includes "Completion of Recommended Preparatory Program" and suggests as a measure "the percent of students who have completed board adopted preparatory programs."[11]

Student Assessment Plan for Schools in Texas

The Committee on Student Learning was appointed by the legislature to study issues and make recommendations to the Board regarding the student assessment program in this state. In February 1992 the Committee made the following recommendations which not only have relevance for the AEIS but also provide important guidance for development and implementation of standards and measures of performance for vocational and applied technology education: the assessment strategy should be (A) based on outcomes; and (B) primarily performance based, consisting of a combination of standardized paper and pencil measures and performance measures.[12]

> *Assessment should be...*
>
> * *based on outcomes;*
>
> * *primarily performance based...*
>
> ***Committee on Student Learning, 1992***

Board Approved Priority Occupations for Texas

During 1991 a task force reviewed labor market and work force planning information to update for the State Board of Education a list of jobs for which future

demand in Texas is substantial, wages are forecast to be greater than $6.44 per hour, and training requirements do not exceed four postsecondary years. In March 1992, the Board approved a list of approximately 60 priority occupations. To this list of jobs was added a short list of additional, new, and emerging occupations that, although not meeting all of the review criteria, offer promising opportunities for students enrolled in schools in Texas to contribute to the state's economic growth. The approved list includes specific occupations that students could prepare to enter by enrolling in vocational and applied technology education programs in agriculture (e.g., production clerk), home economics (e.g., child care), health occupations (e.g., medical assistant), industrial technology (computer operator), marketing (e.g., sales person), office (e.g., legal secretary), or trade and industrial education (e.g., welder/cutter).

Because one of the purposes of the system of standards and measures of performance demanded in the Perkins Act of 1990 is to ensure that vocational and applied technology education programs provide students with strong experience in and understanding of all aspects of the industry they are preparing to enter, the list of Board approved priority occupations has special relevance in this project. The importance of this list is further underscored in comments made to the Board by staff of the TEA in April 1992 pointing out that, ultimately, standards and measures should be developed not only to comply with federal law but more importantly to measure and encourage the pursuit of equity and excellence in public education. Standards should, therefore, address real world outcomes and appropriate measures be developed and validated to ensure that industry standards are met. An approved list of priority occupations provides focus for the development and implementation of a statewide system of standards and measures of performance for vocational and applied technology education in secondary schools in Texas.

Section 2: GOALS AND OBJECTIVES

In order to meet the challenge of designing and implementing by July 1992 an evaluation system to meet the requirements of the Perkins Act of 1990 and enable school districts in Texas to document progress of secondary school students participating in vocational and applied technology education programs, TEA authorized research and development contract awards to the Extension Instruction and Materials Center (EIMC) at The University of Texas at Austin. The first award was made in July 1990 and the second in July 1991. The work plans for this sequence of two one-year projects was designed to research and develop measurable and objective criteria to assess the quality and performance of vocational and applied technology education in secondary schools in Texas.

> *The overall objective of this project is to research and develop measurable and objective criteria to assess the quality and performance of vocational and applied technology education in secondary schools in Texas:*
>
> *Objective A: Conduct a feasibility study of core performance standards in a sample of 12 school districts in Texas.*
>
> *Objective B: Continue development of standards for specific sequences of courses in vocational and applied technology education.*
>
> ***Project Work Plan, July 1991***

Specific objectives for project year 1990-1991 were to (A) conduct background research on performance standards in vocational and applied technology education, and (B) delineate model performance standards for selected vocational programs. During 1990 and 1991, library research was conducted, a mailed survey of other states was made, a general advisory committee was convened and consulted, a set of "core" standards was drafted, and a series of teleconferences were conducted with small, specially assembled advisory groups to review, critique, and revise the proposed standards. In September 1991, the person who was the project manager during 1990-1991 resigned from the project for health reasons. An entirely new research and development team was brought into the project in October 1991. The final report for project year 1990-1991 which describes activities and products of the first year's efforts was prepared from project records by the new project manager. That report was submitted to the TEA in December 1991.[13]

Objectives for project year 1991-1992 were to (A) conduct a feasibility study of core performance standards in a sample of 12 school districts in Texas and (B) continue the development of model performance standards for specific sequences of courses in vocational and applied technology education. The work plan for this second and final year of the project states that three products will be delivered: (1) course-specific

performance standards for those vocational courses for which they are needed; (2) a feasibility study of the core performance standards developed during 1990-1991; and (3) a data-gathering instrument that vocational administrators in local school districts can use in conducting their districts' annual evaluations based on the core standards and measures of performance. A copy of the abstract of the work plan for project year 1991-1992 is in Appendix A.

Section 3. PROJECT DESIGN AND PROCEDURES

This project used different procedures to achieve the two objectives. Objective A was addressed by visiting 12 school districts to interview school district personnel and pilot test the core performance standards, measures of performance, and prototype data collection instrument (see Table 1). To attain Objective B a multi-attribute policy analysis procedure was used to evaluate the options and formulate recommendations regarding standards for specific sequences of courses in vocational and applied technology education (see Table 2).

Table 1: Overview of Procedures Used to Address Objective A

OBJECTIVE	PROCEDURES
Objective A: Conduct a feasibility study of core performance standards in a sample of 12 school districts in Texas	* Drafts of performance standards and prototype data collection instrument were submitted to the General Advisory Committee for critique; * Interviews, records reviews, and piloting of the data collection instrument took place in 12 schools districts; and * Feasibility was assessed against criteria established by the General Advisory Committee.

Preparing Core Standards for Feasibility Study

In October 1991, the General Advisory Committee for this project met in Austin to review and revise drafts of core performance standards that were developed during project year 1990-1991. Section 1.7 of the state plan for vocational and applied technology education for 1992-1994 says that three standards will be implemented for school year 1992: (1) measures of learning and competency gains; (2) job or work skill attainment or enhancement; and (3) placement into additional training or education, military service, or employment. As is noted on page 1 of this document, the Perkins Act of 1990 requires only two standards and measures of performance. The Advisory Committee and the project team during 1990-1991 were more comprehensive in their approach and identified one or more standards and measures to address each component

and element named in Section 117 (b) (Requirements) of the Act. Drafts that were presented at the meeting of the committee in October of 1991 included, therefore, a total of 11 "core" standards and measures of performance that would be applicable across all vocational and applied technology education programs in secondary schools in Texas.

The meeting was attended by one representative from industry, two from school districts, two from postsecondary schools, two from the state council on vocational education, and nine program directors of vocational and applied technology education from the TEA. The committee recommended substantial revision of one of the 11 standards and changes in wording for 8 others. The committee also expressed concern about what constitutes a "coherent sequence" of courses in a vocational and applied technology education program. Representatives from the state council on vocational education informed the committee that their report to the Board recommends that a student who concentrates in vocational education should be defined as an individual who has successfully earned at least four credits in an occupational field. It was suggested that the issue will require longitudinal research for its resolution. Despite these concerns and in the interest of being timely in implementing the statewide system that the Perkins Act requires, the advisory committee approved plans for the feasibility assessment to be conducted in November and December of 1991. A copy of the minutes of this meeting of the General Advisory Committee is in Appendix B. A copy of the standards and measures as revised and approved for field assessment also is included in Appendix B.

Visiting School Districts to Collect Data

Participation in the feasibility study was recruited to represent districts of different sizes located in different parts of the state: central, east, far south, far west, north, and north central. The vocational administrator in these districts received an advance copy of the proposed standards and a draft of the data collection instrument. The administrators were asked to use data they already had on hand for school year 1990-1991 to fill in as much of the data collection instrument as possible prior to the arrival of the project evaluation staff.

Four large, 3 medium size, 4 small, and 1 very small school districts participated in the field study in November and December 1991.

Single day trips to the 12 school districts were made in November and December 1991. Project staff usually were on site from 9:00 am to 4:00 pm. The morning hours were spent meeting with the vocational program administrator and other school district personnel invited by the administrator. These meetings usually were attended by a guidance counselor, special populations educator or coordinator, and one or more

persons from the district's management information office or unit. The majority of the meeting time was spent discussing possibilities for obtaining information called for on the data collection instrument in order to measure program performance. Having determined what data bases and records should be consulted, school district personnel located as many of the records and sources of information as possible at that time. Project personnel spent the afternoon hours compiling the information onto the data collection instrument. An exit interview was conducted to review results of the evaluation, determine how missing data might be obtained, and solicit critique and suggestions for revising the standards and restructuring the data gathering instrument.

Assessing Feasibility of Core Standards

The work plan for this second year of this project listed nine criteria for evaluating feasibility of the standards and measures of performance. These criteria, which were derived from guidance provided by the General Advisory Committee during its two meetings in 1990-1991, specified that the standards and measures should be (1) clearly defined, (2) cost efficient, (3) manageable in number, (4) relatively easy to measure, (5) timely, (6) goal oriented, (7) attainable, (8) credible, and (9) focused on product rather than process. Information obtained during the on-site interviews and from the process of entering data onto the data gathering instrument was used to determine the extent to which the standards and measures met these feasibility criteria.

> *The standards should be clearly defined, cost efficient, manageable in number, relatively easy to measure, timely, goal oriented, attainable, credible, and focused on product rather than process.*

A summary report was drafted in mid-January 1992 and submitted to program directors at the TEA. In a meeting with this subgroup of the General Advisory Committee, additional critique and suggestions for increasing the usability of the standards and of the data gathering instrument were obtained.

Identifying Options for Course-Specific Standards

One of the major activities of project year 1990-1991 was a review of the literature and the production of an annotated bibliography regarding the state of the art and science of evaluating performance of vocational and applied technology education. The materials assembled in that effort were very useful in determining what the options are for developing course-specific performance standards. In addition to reviewing written materials, project staff met several times with staff at the TEA and consulted individuals at the Center for Human Resource Development at the University of Texas,

at the Private Industry Council of Austin/Travis County, and at the Texas Department of Commerce regarding possible strategies for developing standards and measuring student outcomes for specific courses.

Table 2: Overview of Procedures to Address Objective B

OBJECTIVE		PROCEDURES	
B	Continue development of standards for specific sequences of courses in vocational and applied technology education	*	Information collected during 1990-1991 and suggestions made by school district personnel during the feasibility assessment were reviewed and guidance was sought from program directors at the TEA to identify options for developing course-specific standards;
		*	Cost-and-Benefit criteria were developed for evaluating the options;
		*	Options were compared and the most promising option selected and used to formulate recommendations regarding standards and measures of performance for at least one specific course in each program area.

Criteria for Comparing the Options

A list was made of statements from the SCANS reports, minutes of meetings of the State Board of Education, and minutes of the General Advisory Committee about characteristics that standards and measures of performance should have. This list, which is shown in Table 3, was used as a guide in comparing the benefits of the different options identified for development of course-specific standards.

The first criterion is that the standards be based on outcomes. This was a specific recommendation of the Committee on Student Learning appointed by the Texas Legislature. An outcome is "a culminating demonstration of prior learning that is applied in a specified performance context."[14] Outcomes as they apply to specific courses of study in vocational and applied technology education in secondary schools in Texas means that students are prepared to get and keep jobs that are and will be available in the local economy.

Table 3: Dimensions Used to Compare Options for Course-Specific Standards

Course-Specific Standards and Measures of Performance Should...

1 be based on outcomes;

2 assess attainment of specific occupational skills;

3 assess levels of proficiency for SCANS competencies;

4 assess use of problem-solving and basic and advanced academic skills;

5 be primarily performance-based;

6 be education-based and nation-wide; and

7 apply to all students pursuing courses of vocational and applied technology education, including those who are members of special populations.

Cost Considerations in Development and Implementation of Course-Specific Standards include...

1 how soon the system will be available;

2 how much instructional time would be consumed in administering the system;

3 dollar costs of system development/acquisition; and

4 dollar costs of system operations and maintenance.

The second criterion is that the system assess specific occupational skills. This recommendation is derived from the Perkins Act. In particular, the Perkins Act indicates that assessment should address students' understanding of all aspects of the industry they are preparing to enter including planning, management, finances, technical and production skills, underlying principles of technology, labor and community issues, and health, safety, and environmental issues. This recommendation is reinforced in JTPA which names as a performance indicator for job training programs for youth "attainment of recognized employment competencies."

The third criterion for evaluating alternative strategies for development and implementation of course-specific standards and measures of performance is capabilities for assessing levels of proficiency in the SCANS competencies. The SCANS believes that all students should be able to demonstrate these competencies by the time they can legally leave high school, age 16 in most states. A detailed listing of the competencies is in Appendix D.

The fourth criterion is that, in addition to specific occupational skills and SCANS competencies, standards and measures should also assess use of problem-solving and basic and advanced academic skills in a technological setting. The Perkins Act specifies that these skills should include mathematics, reading, writing, science and social studies. This requirement is convergent with the stipulation in *America 2000: An Education Strategy* that standards incorporate both knowledge and skills to ensure that, when they leave school, young Americans are prepared for further study and the workforce. The America 2000 strategy recommends that assessments in grades 4, 8 and 12 address student progress in English, mathematics, science, history, and geography. The SCANS recognizes the importance of these kinds of basic skills and qualities and lists them among the elements that are the Foundation of workplace know-how.

The fifth criterion is that the system be primarily performance based, consisting of a combination of standardized paper and pencil measures and performance measures. This recommendation was made to the State Board of Education by the Committee on Student Learning. It helps to define what is encompassed in the concept of assessing basic skills in a technological setting. It also is consistent with the observation of the SCANS that most existing tests--largely pencil and paper, multiple-choice tests of short-term memory--do little to advance the cause of learning. Performance based assessment is a valuable tool not only as a means for certifying the attainment of competencies but also as a guide for the learner and the instructor about how to distribute future learning time to enable mastery. The final SCANS report emphasizes, therefore, the need for rigorous performance-based assessment.

The sixth criterion is that the system be education-based and nationwide. This recommendation is made in the final report of the SCANS. The system should permit educational institutions to certify levels of proficiency in workplace know-how that their students have achieved. It is expected that colleges would use the results in admissions and employers would pay attention to them in hiring. The aim is to provide a basis for a new kind of high school credential certifying that competencies have been acquired. By making the system education-based and nation-wide, progress will be made toward establishing standards to award technical and professional certificates to ensure quality in the work force and facilitate career progression in the wide variety of occupations that do not require a baccalaureate degree.

The seventh and final "benefit" criterion for comparing options for course-specific standards in vocational and applied technology education is the extent to which the

system is useful in evaluating progress of individuals who are members of special populations. The Perkins Act requires that the statewide system of core standards and measures be useful in this regard. It is also reasonable to demand that course-specific standards lend themselves to this purpose so as to ensure access and success in school and in the work force for persons who are members of special populations.

In addition to these seven "benefits" dimensions, Table 3 also shows a short list of four considerations that were used to estimate and compare costs of the different approaches. The first consideration is how soon the standards and measures will be available for integration into practice. The SCANS took two years to study the problem and make its recommendations and is, at the end of its effort, accused of "ducking major issues" regarding standards and measures of performance.[15] Similarly, the National Advisory Commission on Work-Based Learning, a permanent group appointed by the Secretary of Labor to make recommendations regarding industry-wide, portable skill standards, is reported to have run head-on into obstacles that are thwarting its progress.[16] Apparently, development of standards takes much longer and/or is more difficult than is forecast. Timeliness appears, therefore, to be a critical issue in deciding which option is best for development of course specific standards for vocational and applied technology education.

In documents outlining development of the AEIS in Texas, as well as in the SCANS reports, concerns frequently are expressed regarding the burden of time that is placed on the learning environment by testing and other forms of student assessment. The AEIS is being developed to increase efficiency so that the frequency of testing can be minimized. The SCANS advocates use of assessment strategies that contribute to learning so that assessment time is instructional time. Amount of time demanded for student assessment remains an area of concern and is, therefore, the second "costs" consideration for comparing options for course-specific standards.

The third and fourth considerations are dollar costs. Two kinds of costs were estimated and evaluated. Development and acquisition costs refer to all costs incurred before the system can be integrated into practice--i.e., the pre-implementation costs. Operations and maintenance costs refer to those dollars that must be spent to administer the assessments and report results. They also include the post-implementation research and development costs that are incurred in keeping the assessment system contemporary with emerging technology. As requirements in the workplace change, assessment of student progress toward attaining competencies that position them to be productive in the workplace also must change. The assessment system must have built into it a strategy for keeping the standards and measures up-to-date so that colleges will use results in admissions and employers will pay attention to them in hiring. The costs of keeping the system current must be considered "up-front" in deciding which option is best for development and implementation of course-specific standards in vocational and applied technology education.

Formulating Recommendations Regarding Course-Specific Standards

The work plan for project year 1991-1992 indicated that course-specific standards would be considered for "one sequence of two to four courses within each program area." The minutes of the General Advisory Committee meeting of October 1990 included a list of two or three specific courses in each program area that the committee had nominated as candidates for the development of course-specific standards. The idea of using this list as a guide in this final phase of the project was abandoned, however, because it is inconsistent with the "design down" approach advocated for outcome based education.[17] Unless there is assurance that the course itself was "designed down" from real-world requirements or industry standards, one cannot develop an assessment system that is based on outcomes by starting with a list of courses or sequences of courses. Designing down requires that one begin with a list of jobs that today's students will fill tomorrow and then work backward from industry standards to develop the system for assessing the student's progress toward the real world outcomes of getting and keeping those jobs. For that reason, the list of State Board of Education approved priority and emerging occupations was used as the starting place for formulating course-specific standards in vocational and applied technology education.

Section 4: RESULTS AND ACCOMPLISHMENTS

Results and accomplishments are discussed in two parts. The first part of this section of this report addresses Objective A: Feasibility Study of Core Standards and the second part addresses Objective B: Development of Course-Specific Standards. An overall summary of findings is shown in Table 4.

Table 4: Summary of Findings

Regarding results of the feasibility study for core standards...

* School district personnel were accepting of the number and content of the standards.

* More guidance and definition was requested regarding (1) what constitutes a "coherent sequence of courses;" (2) strategies for compiling data for the evaluation; and (3) how to use the information to develop local program improvement plans.

* Results of the study were used to refine and clarify the standards, measures of performance, and prototype data collection instrument, which were submitted to TEA.

* The set of three standards finally approved by both the Committee of Practitioners and the State Board of Education for school year 1992-1993 were addressed to: (1) passing the statewide academic skills exit test; (2) certification of occupational competencies; and (3) postsecondary placement.

Regarding development of standards for specific courses...

* The 22 Board approved priority or emerging occupations that were identified as jobs that a young person who is still in or has just graduated from high school could expect to enter given appropriate preparation and credentials were selected as targets for this project.

* Of the three options identified as plausible programs for developing course-specific standards to address these 22 occupations, the Student Occupational Competency Achievement Test (SOCAT) was selected as offering the greatest benefits at the least costs.

* Blocks of specific courses that students could take to master elements assessed in the SOCAT were identified for all 14 of the target occupations for which SOCATs are available and for an additional 8 approved occupations that usually require postsecondary training but do not require formal apprenticeship, baccalaureate, or age and experience.

Table 5 is taken from the interim report that was submitted to the TEA in January 1992 and provides an overview of results of the feasibility study.

Table 5: Overview of Results Relating to
Objective A: Feasibility Study for Core Standards and Measures of Performance

Clearly defined: In all 12 districts that participated in the study, concern was expressed regarding definition of "a coherent sequence of vocational education courses."

Cost efficient: Personnel in all 12 districts indicated that the necessary information is available through the Public Education Information Management System (PEIMS), but new data processing programs will be needed to extract the data.

Manageable in number: No one seriously objected to the number of standards (i.e., 11) but they did point out some duplication of effort -- e.g., asking whether or not students passed the Texas Assessment of Academic Skills (TAAS) by the end of their 12th grade year and then asking whether or not students graduated generates almost identical data.

Relatively easy to measure: Although only two of the 11 measures could be calculated during the site visits, district personnel indicated that measurement would be easy if programs were written to pull information from PEIMS and if an efficient strategy was developed to identify students enrolled in "a coherent sequence of courses."

Timely: Because the standards address events that occur at different times in the year -- i.e., enrollment at the beginning of the year, promotion or graduation at the end of the year, and placement after graduation -- school district personnel requested guidance about when to conduct the evaluation.

Goal Oriented: The majority of program administrators in the 12 districts reported that the information requested is the kind of performance data they would like to have in order to keep their programs working as well as possible.

Attainable and Credible: In the one very small district where it was possible to gather all data needed to complete the entire evaluation (because it was possible to pull records for all 30 of the students who were enrolled in vocational education courses), all standards were met except for the one regarding linking course offerings to Quality Work Force Planning.

Focused on outcomes rather than process. District personnel made several suggestions about how to revise the standards to give more attention to outcome -- e.g., enquiring about enrollment in programs relative to work force outlook rather than asking if the outlook was used in making decisions about course offerings.

Feasibility of Core Standards and Measures of Performance

Table 5 provides an evaluation of the proposed standards and measures against the nine criteria that were named in the work plan as characteristics of a feasible and useful system. The most frequent request made by district personnel during the feasibility study was for more specific guidance regarding the definition of "coherent sequence of courses." Their other recommendations for improving the proposed core standards and measures of performance were (1) The data collection form should be structured to provided notation regarding which pieces of data should be sought from the Public Education Information Management System (PEIMS) and for data not found in PEIMS notations should be made as to where these data can be found; (2) Specific instructions should be provided to guide the calculation of each measure of performance; (3) The data collection instrument should be structured to integrate the standards, suggested data sources, and calculation steps into a single document; (4) The number of standards should be reduced by combining those that provide essentially the same information; and (5) Layout of the data gathering instrument should provide a "map" to guide the local evaluator through the data gathering and data evaluation steps. These suggestions guided revisions of the standards and of the data gathering instrument. By combining those that duplicated one another, the number of standards was reduced from 11 to 8.

The revised core standards, which are listed in Table 6, were presented to school district personnel at the Mid-Winter Vocational Supervisors, Administrators, and Counselors' conference. They were detailed in the report submitted to the TEA in January 1992. The report was reviewed by staff at the TEA and forwarded in February 1992 to the state appointed Committee of Practitioners that, in accord with requirements of the Perkins Act, was charged with reviewing the proposed standards and measures before they are presented to the Board and integrated into rules and regulations. The Committee of Practitioners (1) revised the first standard to specify that performance on the Texas Assessment of Academic Skills (TAAS) secondary school exit exam would be the measure of performance rather than promotion to the next grade level, (2) elevated the criterion values for the standards to specify 95 percent of students should pass the TAAS exit exam and 95 percent should graduate from high school, and (3) made wording changes in several others of the standards. Further review of the proposed standards by staff at the TEA, however, resulted in substantial revision of the standards.

Table 6: Core Standards Recommended based on Results of Feasibility Study

1 At least 80 percent of students in grades 9 through 11 who were enrolled in a coherent sequence of courses in vocational education programs were promoted to the next grade level.

2 At least 80 percent of 12th grade students who were enrolled in a coherent sequence of courses in vocational education programs that included, where applicable, at least one occupationally specific course (a) obtained a certification of competency by an accepted licensing or certification agency; OR (b) successfully completed a validated test of occupational competency; OR (c) demonstrated completion and competency in the essential elements for the coherent sequence of courses.

3 The school dropout rate for students in grades 9 through 12 who were enrolled in a coherent sequence of courses in vocational education programs was no greater than the school dropout rate for secondary students district-wide.

4 Among 12th grade students enrolled in a coherent sequence of courses in vocational education programs that included, where applicable, at least one occupationally specific course, the percentage who obtained high school diplomas was comparable to the percent of all 12th grade students in the district who earned high school diplomas.

5 At the one-year follow-up, 75 percent of students who earned their high school diploma after having completed a coherent sequence of courses in a vocational education program that included, where applicable, at least one occupationally specific course were (a) enrolled in a post-secondary educational institution; OR (b) enrolled in a registered apprenticeship program; OR (c) in training related to their vocational education program; OR (d) in military service; OR (e) employed in a paid or unpaid job related to their vocational education and training.

6 Of students in grades 9 through 12 who are members of special populations, the percentages enrolled in vocational education courses was comparable to percentages of those groups of students within the school district.

7 Members of special populations who received special or supplemental services because they were enrolled in vocational education programs were (a) promoted to the next grade level; OR (b) obtained high school diplomas at rates that were greater than those achieved by comparable groups of students who were not receiving special or supplemental services from vocational education.

8 Enrollment in vocational education programs was consistent with the regional (or statewide) occupational outlook compiled as part of the quality work force program in the state of Texas.

In April 1992, a very reduced set of standards was prepared by staff at the TEA and resubmitted to the Committee of Practitioners. Table 7 lists the three standards finally approved both by the Committee of Practitioners and by the State Board of Education in May 1992 for school year 1992-1993. These three standards are expansions of those adumbrated in Section 1.7 of the state plan for vocational and applied technology education for 1992-1994. The prototype data collection instrument has been revised to address just these three standards. The instrument is in Appendix D. Additional information that TEA staff prepared to support their recommendation that these three standards be adopted for school year 1992-1993 noted that "other indicators relating to program effectiveness must be developed."[18] Staff also proposed that follow-up conducted four or five years after graduation may be more appropriate than the one-year follow-up required in standard number three. Their written comments also noted that "appropriate performance tests must be developed and validated, to ensure that industry standards are being met." This last recommendation is annotated in standard number two and is tightly linked to this project's Objective B, which is to develop standards for specific sequences of courses.

Table 7: Core Standards and Measures Approved by the Board for 1992-1993

1	At least 90 percent of students who were enrolled in a coherent sequence of courses in vocational and applied technology education will pass the TAAS exit test.
2	At least 95 percent of 12th grade students who were enrolled in a coherent sequence of courses in vocational and applied technology education programs (a) obtained a certification of competency by an accepted licensing or certification agency, OR (b) successfully completed a validated test of occupational competency, OR (c) demonstrated completion and competency in the essential elements for the coherent sequence of courses. Within three years this standard will be based on performance measures which assess the level of proficiency required by employers and/or institutions of higher education.
3	At the one-year follow-up, 75 percent of students who earned their high school diploma after having completed a coherent sequence of courses in a vocational and applied technology education program were (a) enrolled in a postsecondary educational institution, OR (b) enrolled in a registered apprenticeship program, OR (c) in training related to their vocational education program, OR (d) in a military service, OR (e) employed in a paid or unpaid job related to their vocational and applied technology education and training.

Table 8 provides an overview of findings regarding development of course-specific standards.

Table 8: Overview of Results Relating to
Objective B: Development of Standards for Specific Sequences of Courses

* **Priority Occupations.** Of the approximately 70 jobs that are approved as priority or emerging occupations by the State Board of Education in Texas, 15 require a baccalaureate degree, another 13 require that the occupant be at least 21 years old and/or are not entry level jobs, 5 are apprenticeship occupations, 13 others usually require some postsecondary training, leaving 22 occupations that a young person who is still in or has just graduated from high school could expect to enter given the appropriate preparation.

* **Options for Developing Standards for Specific Courses Linked to the Priority Occupations.** Three options were identified as plausible programs for development and implementation of course-specific standards to assure that industry standards are met: (1) validate competency profiles that school districts currently are required to maintain for each student; (2) use assessment tools that already are developed and being used in other vocational and applied technology education programs across the nation; and (3) design, develop, implement, and maintain a new system. Use of the SOCATs currently available from NOCTI was identified as the option with the greatest relative advantage.

* **Cross-walking SOCATs to Priority Occupations and Specific Courses.** SOCATs already are available for 14 of the 22 priority occupations that young persons can enter while still in or just graduated from high school and for 8 of the 13 other approved priority occupations that do not require apprenticeship or baccalaureate degree. Sets of two to four courses in the current curriculum for vocational and applied technology education in secondary schools in Texas were identified as specific courses that would prepare the student to demonstrate mastery of knowledge and skills assessed with these 22 SOCATs.

Occupations from which to "Design Down" to Course-Specific Standards

The *Occupational Outlook Handbook* published by the U.S. Department of Labor was consulted for information with which to sort the Board approved priority and emerging occupations into categories that reflect the amount of training that experts believe is needed to make the job candidate "work ready" for that occupation.[19] Results of this analysis are shown in Table 9.

Table 9: Jobs Approved by the State Board of Education as Priority or Emerging Occupations in Texas

Occupational skills training not required:
dental assistants
gardeners/groundskeepers
receptionists
salespersons, parts
stock clerks, sales floor

Occupational skills training an advantage:
billing clerks
carpenter's helpers
diesel mechanics
electrician's helpers
legal secretaries
maintenance repairers
mechanic's helpers
medical assistants
medical secretaries
other construction helpers
other health service workers
other protective service workers
other secretaries
plumber's helpers
production clerks
welders & cutters
word processing typists

Postsecondary training/college preferred:
auto mechanics
child care workers
computer operators
computer programmers/aides
drafters
machinists
radiologic technicians
electrical/electronic technicians
food service managers
licensed practical nurses
other engineering technicians
management support workers
preschool teachers

Apprenticeship preferred/required:
carpenters
electric powerline installers
electricians
painters/paper hangers
plumbers/pipefitters

Baccalaureate preferred/required:
adjustment clerks
bill and account collectors
business service agents
elementary teachers
insurance sales persons
other managers
other teachers
personnel managers
personnel specialists
property/real estate managers
registered nurses
sales representatives, wholesale
social workers
special education teachers
systems analyst, EDP

Not entry level job OR occupant must be 21+:
corrections officers
first line supervisors:
- clerical
- construction trades
- mechanics
- production
- sales
- service
- other

industrial truck operators
police patrol officers
school bus drivers
tellers
truck drivers

A worksheet included in Appendix E provides summary comments to note why the jobs were categorized as shown in Table 9. The worksheet explains, for example, that entries in the *Occupational Outlook Handbook* under the heading of "dental assistants," indicate that employers seek persons with a congenial personality to fill these

positions. Information under the heading of "billing clerks" indicates that the work usually requires substantial on-the-job-training. And maintenance repair worker is a term that covers a number of specific occupations. One of these is home entertainment equipment repairer. The worksheet shows this type of maintenance repairer usually is self-employed.

It should be noted that some of the specific occupations that have lesser training requirements probably serve as entry positions on career ladders for other occupations in the approved list that demand greater amounts of training. The position of stock clerk, for example, has no formal training requirement. It could serve, however, as a first step toward becoming a first line sales supervisor, a position that usually is filled by persons with substantial experience in the industry. This kind of progression is especially noteworthy for the positions that require formal apprenticeship. In many regions of Texas today these programs are concentrated in construction trades where the number of apprenticeship slots is shrinking and generally filled from "within" the industry.[20] In order to enter an apprenticeship program to progress in the carpentry trade, for example, it may be necessary to begin as a carpenter's helper.

The list of occupations categorized on the basis of amount of training that experts indicate would be preferred or required to make a person "work ready" provided the base around which to identify and compare options for developing standards for specific courses in vocational and applied technology education. Thirteen of the 67 jobs listed in Table 9 require that the occupant be at least 21 years old (e.g., police patrol officers must be at least 21) and/or are not entry level jobs (e.g., first line supervisor is not typically filled by someone just entering the industry). Fifteen of the jobs usually require a baccalaureate degree. Property/real estate manager, for example, requires a baccalaureate degree and the "Occupational Demand and Formal Occupational Supply Report" that is included in the State Plan for Vocational and Applied Technology Education shows 0 supply anticipated from Secondary Vocational and Applied Technology Education (Secondary Voc-Tech). Several of the occupations that are described in the *Occupational Outlook Handbook* as usually requiring or preferring a baccalaureate degree are formally expected to experience supply from Secondary Voc-Tech. These occupations are noted in the worksheet in Appendix E.

Thirteen others of the jobs listed in Table 9 usually require some postsecondary training. An associate degree is preferred, for example, for entry level positions as electrical/electronic technicians. Five of the occupations have formal apprenticeship programs. Although 30 to 50 percent of the supply for these occupations is anticipated from Secondary Voc-Tech, observers in some parts of the state note that the slots usually are filled from within the industry. That leaves an approved list of 22 occupations that a young person who is still in or has just graduated from high school could expect to enter given appropriate preparation and credentials. It seems reasonable to begin the enormous task of developing course specific standards to prepare secondary school students to enter and be productive in these 22 occupations.

Options for Developing Standards for Courses Linked to Specific Occupations

Through review of the literature and consultation with experts in the field of work force development, three options were identified as plausible programs for developing and implementing course-specific standards to assure that industry standards are met: (1) validation of competency profiles that school districts currently are required to maintain for each student; (2) use of assessment tools that already are developed and being used in other vocational and applied technology education programs across the nation; and (3) design, development, validation, implementation, and maintenance of a new system.

Competency Profiles. Section 21.122 of the Texas Education Code says that a competency profile must be maintained for each student enrolled in vocational education. To facilitate this type of performance evaluation and record keeping, forms have been constructed to list the essential elements for specific courses and provide a rating scale to show the level of competence achieved by the individual student for each of the essential elements of instruction and learning. In one of the school districts that was visited during the feasibility assessment, competency profiles are routinely used to document the student's progress through a "diploma plan" that is negotiated early in the student's tenure in secondary school. In most districts, however, methods for assessing competence and actual use of the forms is left to the discretion of the teachers and counselors. In many cases, records of course completion serve as documentation of the student's occupational competencies. Section 75.211 of the *State Board of Education Rules for Curriculum* says that "Competency profiles for students in vocational education courses, other than grades 11 and 12 occupationally specific courses, shall be defined as evidence of mastery of the essential elements."[21] Nonetheless, one option for developing course-specific standards is to review the inventory of competency profiles that are being used in school districts, revise them as needed to meet SCANS specifications, and conduct an industry validation for each.

Off-the-Shelf Assessment Tools. At least a dozen associations and independent agencies have developed test-item banks and assessment tools to support competency based vocational and applied technology education. The Vocational-Technical Education Consortium of States (V-TECS) is the most well-known and comprehensive resource for industry-validated, competency-based curriculum and assessment materials. The National Occupational Competency Testing Institute, Inc. (NOCTI) is a nonprofit corporation that develops and administers Student Occupational Competency Achievement Tests (SOCAT). A number of state education agencies have undertaken development of competency assessment tools. South Carolina, for example, currently is developing teacher generated standards and measures with review by industry groups for 90 occupations. A second option for developing course-specific standards for vocational and applied technology education in Texas, therefore, is to identify appropriate ones of these already developed tools and link them to specific courses in secondary schools.

Development of a New System. The third plausible approach is for the state to develop its own course-specific assessment system. This third possibility is suggested in written comments submitted to the State Board of Education by staff of the TEA as part of the discussion regarding the proposed core standards and measures. The overview document stated that additional standards and measures will be developed by "utilizing a wide variety of input from personnel throughout the Agency, practicing academic and vocational educators, business and industry representatives, and members of the general public."[22]

Comparing the Options

Table 10 shows how the different options fared when they were evaluated against the seven "benefits" and four "costs" dimensions that were specified in the procedures section of this report. The values that are entered in the Table 10 are subjective assessments whose basis is explained in the following paragraphs. In calculating the utility value for the different options, equal weight was given to each dimension. That means that as a group, the "benefits" dimensions contributed slightly more weight to the utility score than did the "costs" dimensions because there are more of them. Inspection of Table 10 shows that, at this point in time, the SOCAT, which is an "off-the-shelf" student assessment system available through NOCTI, has the highest overall utility as a strategy for developing course-specific standards for vocational and applied technology education in secondary schools in Texas. Noteworthy strengths of the SOCAT system are that it is performance based, nationwide, and immediately available.

Competency Profiles. As mandated by the Rules of Curriculum, competency profiles have been constructed to track the student's mastery of essential elements of instruction and learning. At the present time there is no assurance that the essential elements are themselves industry validated. A major limitation of this option is, therefore, that it is based on the traditional approach of "designing up" from the curriculum rather than "designing down" from industry standards. The profiles were given a score of 0 on this dimension. Because the essential elements applicable across all vocational and applied technology education courses include some of the dimensions that have been identified as SCANS competencies and foundations--e.g., "demonstrate effective communication skills both oral and written and follow through on assigned tasks" and "demonstrate productive work habits and attitudes"--the profiles were assigned a score of 1 on these two dimensions. As has already been noted, methods for assessing student performance usually is at the discretion of the teacher or counselor. The extent to which the profiles are performance based is, therefore, unknown at this time. The profiles are written to the essential elements of instruction for public schools in Texas and do not, therefore, lend themselves to participation in a nation-wide system for certifying competencies that students attain in schools. This dimension earned a score of

Table 10: Comparison of Options for Course-Specific Standards

		PROFILES	V-TECS	SOCAT	NEW
	BENEFITS DIMENSIONS				
1	outcome based	0	2	2	2
2	assesses occupational skills	2	2	2	2
3	assesses SCANS competencies	1	UK	UK	2
4	assesses foundation qualities	1	UK	UK	2
5	performance-based	UK	-2	2	2
6	nation-wide	-2	2	2	-2
7	applicable for all students	1	UK	2	2
	COSTS DIMENSIONS				
1	how soon available	-1	0	2	-2
2	administration time	UK	2	1	2
3	development costs	-1	0	0	-2
4	operation/maintenance cost	-1	2	0	-1
	AGGREGATE UTILITY SCORE	0.00	1.00	1.44	0.64

Scale for Benefits: definitely not (-2) probably not (-1) uncertain (0) probably (1) definitely (2)
Scale for Costs: very high (-2) high (-1) moderate (0) low (1) very low (2) UnKnown (UK)

-2. Although, methods of assessment are discretionary, it seems likely that teachers and counselors use the profiles in similar ways with all students, including those who are members of special populations. A score of 1 was assigned for this dimension.

The profiles earned uniform -1 scores on the costs dimensions because, although work has already been done to develop the profiles, additional development time and dollars will be needed to validate them, cross-walk them to the SCANS competencies and foundation qualities, and keep them up to date. The overall utility of this approach for developing course specific standards is 0 on the scale that runs from a "worst case" whose value would be -2 to "best case" whose value would be +2.

Off-the-Shelf Assessment Tools. Two sources of already developed assessment systems were evaluated. A telephone survey of a sample of seven states that have

engaged in development of their own assessment system showed the majority of them to be linked to V-TECS and/or to have abandoned their development activities.

Two of V-TECS's products -- (1) catalogs that list job duties, specific tasks, performance steps, and standards for acceptable performance; and (2) criterion-referenced test item banks -- could be purchased to provide course-specific standards and measures of performance for specific courses of study in secondary schools in Texas. These materials are outcome based in the sense that they are related to specific occupations and are validated by panels of experts from industry. V-TECS earns a score of 2 on this dimension. Both the catalogs and the test-item banks are designed to assess occupational skills. The system earns a score of 2 for this dimension. At this time the extent to which the V-TECS systems assess SCANS competencies and foundations is unknown. The test-item banks are limited to paper-and-pencil measures and therefore earn a score of -2 for failing to be primarily performance based. The system is, however, nation-wide. The ways in which the testing must be adjusted to accommodate students who are members of special populations is unknown.

Although V-TECS has test item banks for a substantial inventory of occupations, the overlap with priority occupations in Texas is quite limited. V-TECS's current completed and under-development list of test-item banks would address only carpenter's helper, maintenance repair worker (small engine repairer), secretary, and several health worker specializations under the "other health workers" occupation. The system was assigned a score of 0 on the availability dimension because of the wait time that would be required to gain access to test-item banks that are addressed to Board approved priority occupations. The system is designed to be a useful part of the instructional process in the classroom and therefore makes minimal demands for time to administer. Although acquisition costs appear to be low at first glance--i.e., catalogs cost $10 to $75 each and the test item bank costs only $25 on diskette (these are member prices because Texas is in the consortium)--a score of 0 was assigned for this dimension because of dollar costs that could be incurred in expanding the inventory of assessment tools to make a better match with the list of priority occupations in Texas. A score of 2 was assigned to the operation/maintenance dimension because Texas would not bear the maintenance costs and could disengage from use of the V-TECS at any time. The aggregate utility score for taking this approach to developing and implementing course-specific standards is 1.

SOCATs are developed by vocational educators with the cooperation of industry personnel. Content is validated by individuals from the world of work and the assessment packages are field tested in secondary and postsecondary schools. SOCATs are periodically reviewed and revised to ensure that they are current. They earn a score of 2 with respect to being outcome based. The tests are designed to assess end-of-program accomplishment of occupational skills and earn a score of 2 on that dimension. The extent to which the tests assess SCANS competencies and foundation qualities is unknown at this time. They use a combination of standardized paper and pencil

measures and performance measures. The multiple-choice style paper and pencil test can be administered by any teacher or counselor. A journeyman tradesperson or business representative with technical expertise in the occupation should administer the performance test which, for most occupations, requires approximately 2 to 3 hours. Advisory committee members or co-op employers frequently are the ones who administer the performance tests for secondary school students. SOCATs earn a score of 2 for being performance-based. The tests are criterion referenced. The information that is returned to the student and the school district also provides, however, normative information. The student report includes comparisons and a certificate of completion. The school receives a class report that provides a composite of the student reports by class, school, state, and nation as well as the performance criterion listing for each student. SOCATs currently are used statewide in secondary schools in Pennsylvania, Tennessee, and Louisiana and are required nationwide for program completers at Job Corps centers. The system earns, therefore, a score of 2 for lending itself to the purposes of nation-wide evaluation and certification. Each assessment package comes with an optional scholastic ability test that encompasses both verbal and nonverbal components to facilitate interpretation of the assessment results. This feature makes the system applicable for all students, including those who are members of special populations. The system earns a score of 2 on this dimension.

One of the chief advantages of the SOCAT system is that it is available for immediate implementation. SOCATs already are available for 14 of the 22 priority occupations that young persons can enter while still in or just graduated from high school and for 8 of the 13 other approved occupations that do not require apprenticeship or baccalaureate degree. SOCAT earns a score of 2 on this dimension. The system does impose some time burden for administration--the multiple choice tests usually take approximately 3 hours and the performance test 2 to 3 hours. Advanced planning is required and NOCTI supplies materials to assist with this planning. Because the tests enable the students to demonstrate their skills in context, much of the engaged time can be counted as learning time. This dimension has an assigned score of 1. There would be no development costs to the state of Texas. The cost for operating the system includes a processing fee of $10.50 per student, materials costs for the performance test that ranges from $0.00 to $19.92 per student, and costs incurred in bringing the journeyman tradesperson or business representative to the test site. These costs are largely offset, however, by the fact that updating of the tests is the responsibility of NOCTI. The system earned a score of 0 on this dimension. The aggregate utility score for this approach for developing course-specific standards for vocational and applied technology education in Texas is 1.44.

Development of a New System. The third option is for the TEA to develop its own course-specific assessment system. This approach appears an attractive option because the system can be designed to specification. It can be outcome based, primarily performance-based, applicable for all students enrolled in vocational and applied technology education including those who are members of special populations. It can be

designed to assess occupational skills, SCANS competencies, and foundation qualities for workplace know-how. By following the guidance of the AEIS and the SCANS, developers of the system could minimize the system's demands on instructional and learning time. For these reasons, a score of 2 was assigned for all but one of the "benefits" dimensions. The one exception was the assigning of a score of -2 because development of the state's own system would not lend itself to participation in the nation-wide assessment system called for in the America 2000 strategy and recommended by the SCANS. Given the current emphasis on redesigning schools and the resources that are being made available from SCANS (e.g., task lists constructed around the SCANS competencies and foundations for specific occupations) and from other federally supported research and development efforts, this option appears very attractive.

However, there are at least two major obstacles along this path. First, the system would not become operational until some time in the future. Although staff at TEA have forecast that the system would be developed "within 3 years," this option was assigned a score of -2 on this dimension. Research and development activities often take longer than is forecast. South Carolina, for example, is developing teacher generated standards with review by industry groups for paper-and-pencil tests in 90 occupational areas. Because technology is changing so fast, the tests have had to change and are not ready at the time when they were expected. Even after the tests are developed, this problem will persist -- as technology changes in industry, performance assessments must also be revised and updated. These costs would show up as maintenance costs that would offset any savings realized in operation of an "in-house" system. The second major obstacle on this path is the very high dollar cost for research, development, and validation. Even starting with the advantage of recommended task lists from the SCANS, development of paper-and-pencil, portfolio, and/or performance measures is expensive. Content validation by panels of experts is expensive. Production is expensive. These anticipated costs earned a score of -2. Furthermore, the state would have to remain committed to its own in-house system--i.e., unlike contracting with an outside agency--such as V-TECS or NOCTI--a system purchased by the state's research and development dollars could not be easily abandoned even if after a time it appeared to be less effective or efficient than another alternative. Maintenance costs, therefore, could be very high. A score of -1 was assigned for this dimension. The aggregate utility score for developing the state's own assessment system is 0.64.

The Best Option. Comparison of the aggregate utility scores for the different options showed SOCAT to be the most promising option -- i.e., to offer the greatest benefits for the least costs. It earned 1.44 points on the scale from "worst case" value of -2 to "best case" value of +2 compared with 1.00 for V-TECS, 0.64 for developing a new system, and 0.00 for validating competency profiles that currently are used in school districts in Texas.

Comparison of the options showed SOCAT to offer the greatest benefits at the least costs.

Table 11: Matching SOCATs to Priority Occupations that Do Not Require Formal Apprenticeship, Baccalaureate Degree, or Age and Experience

PRIORITY OCCUPATION	SOCAT
Occupational Skills Training Not Required	
dental assistants	dental assisting
gardeners/groundskeepers	
receptionists	
salespersons, parts	
stock clerks,sales floor	
Occupational Skills Training an Advantage	
billing clerks	business data processing
carpenter's helper	carpentry
diesel mechanics	diesel engine mechanics
electrician's helpers	electrical occupations
legal secretary	
maintenance repairer	small engine repair
mechanic's helper	
medical assistants	medical assisting
medical secretary	
other construction helpers	building construction occupations
other health worker	home health aide
other protective service	
other secretaries	general secretarial
plumber's helpers	plumbing
production clerks	production agriculture
welders & cutters	welding
word processing typists	general office
Postsecondary Training/College Preferred	
auto mechanics	auto mechanics
child care worker	child care services
computer operators	computer & information sciences
computer programmers/aides	computer programming
drafters	drafting
machinists	
radiologic technicians	
electrical/electronic technicians	electronic technology
food service mgr	food production, management, & service
licensed practical nurse	practical nursing
other engineering technicians	
management support workers	
preschool teachers	

Cross-walking to Priority Occupations and Specific Courses

The current inventory of SOCATs includes assessment packages for 22 of the 35 Board approved occupations that do not require formal apprenticeship, baccalaureate degree, or minimum age and experience. The cross-walk of SOCAT to the list of approved occupations is shown in Table 11. Fourteen of these matches were for occupations that a young person could expect to enter while still in or just graduated from high school--i.e., those that do not prefer or require postsecondary training, college, or minimum age or experience. Eight additional matches were made for occupations in which postsecondary training or college is preferred but baccalaureate or formal apprenticeship is not preferred or required.

The SOCAT for each of the 22 occupations matched as shown in Table 11 also was cross-walked to specific courses in vocational and applied technology education in secondary schools in Texas. This task was accomplished by matching essential elements in the Rules for Curriculum with elements listed as areas of assessment in the SOCAT. Results of this cross-walking showed that there were no occupation-SOCAT matches in marketing education. There was 1 in agricultural education, 4 in health occupations, 2 in home economics, 3 in office education, 2 in industrial technology, and 10 in trade and industrial education. Table 12 shows results of the cross-walk to the curriculum for one course in each of the program areas. The detailed analysis for all 22 occupation-SOCAT matches is in Appendix F.

With the exception of production clerk/production agriculture, which was the only occupation-SOCAT match related to agricultural education, each of the SOCATs and matching courses that was selected for display in Table 12 was chosen because there already is an industry or professional certification ladder for the specific occupation.[23] For secretaries, testing and certification of entry-level skills is available through the Office of Proficiency Assessment and Certification (OPAC) program of Professional Secretaries International (PSI). Advanced certifications can be earned by passing a series of exams offered by PSI's Institute for Certifying Secretaries. Carpenter's Helpers can seek to enter formal apprenticeship programs to obtain a series of entry level, intermediate, and journeyman certifications as a Carpenter through the local chapters of carpenters' and contractors' unions. Medical Assistants obtain the Certified Medical Assistant Credential through the American Association of Medical Assistants. For child care workers the Child Development Associate (CDA) credential is offered by the Council for Early Childhood Professional Recognition. Award of the CDA is based on a formal skills assessment. Computer Operators can be certified through the Institute for Certification of Computer Professionals by passing a core exam and exams in two specialty areas.

Table 12. Matching SOCATs to Specific Courses of Study

occupation - SOCAT - program area	Specific Courses of Study
other secretaries - general secretarial - Office Education	Office Administration Business Information Processing Business Office Services Business Computer Applications Office Support Systems Microcomputer Applications
production clerk - production agriculture - Agricultural Education	Agribusiness Management & Marketing Animal Science Plant and Soil Science Introduction to Agricultural Mechanics
carpenter's helper - carpentry - Trade and Industrial Education	Building Trades Construction Carpentry Introduction to Construction Careers
medical assistants - medical assistant - Health Occupations Education	Health Care Science Electrocardiograph Technician Medical Lab Aide Nursing Assistant, Radiology Medical Office Assistant
child care worker - child care services - Home Economics Education	Child Care and Guidance, Management and Services
computer operator - computer and information sciences - Industrial Technology Education	Business Information Processing Business Computer Programming I Business Computer Applications I

NOTE: The analysis indicates that the student would need to take all of the courses listed in the block to achieve mastery of the specific knowledge and skill areas assessed in the relevant SOCAT.

Four of the occupations -- secretary, carpenter's helper, medical assistant, and computer operator -- are jobs for which the SCANS has developed task lists linked to the SCANS competencies and foundation skills and qualities (see Appendix C of this document for more detailed information about the SCANS task lists for these priority occupations for Texas). These four occupations -- which have (1) an existing industry-based assessment and certification system, (2) an up-do-date task analysis linked to the SCANS competencies and foundations; (3) the education-based, nation-wide assessment system offered in the SOCATs, and (4) an existing block of vocational and applied technology education courses to enable the student to achieve the necessary skills -- are especially attractive as candidates for pilot testing of the utility of the SOCATs.

Secretary, carpenter's helper, medical assistant, and computer operator are especially attractive candidates for pilot testing the utility of SOCAT as an assessment system to provide course-specific standards for vocational and applied technology education in secondary schools in Texas.

If the SOCATs for these four occupations were adopted statewide for a longitudinal study of the utility of using the SOCATs as one element of the emerging nation-wide system for assessing and certifying levels of proficiency attained in school and on-the-job, the projected cost of administering the SOCATs would be less than $30,000 per year. The cost shown in Table 13 for each SOCAT includes the $10.50 per student processing fee and the per student cost of materials consumed in conducting the performance assessment. The projected total cost is based on the assumption that every secondary voc-tech student that is forecast as contributing to the total supply for the occupation would take the SOCAT.[24] Table 13 also shows the percent of total supply that is forecast as coming from secondary vocational and applied technology education.

Table 13: Projected Costs for Administering these Four SOCATs Statewide

SOCAT	COST PER	STUDENTS	% OF SUPPLY	TOTAL
carpentry	$10.50	950	64	$ 9,738
medical assisting	$10.50	99	2	$ 1,040
computer operator	$12.50	1,164	13	$ 14,550
general secretarial	$11.50	161	41	$ 1,852
				$ 27,179

If all 22 of the SOCATs that match Board approved priority occupations that do not require formal apprenticeship, baccalaureate degree, or age and experience were adopted state-wide and every secondary vocational and applied technology education student that is forecast as contributing to the supply for the related occupations were to take the tests, the total projected cost per year for administering the SOCATs in Texas would be less than $755,000. For fiscal year 1992, this amount of money represents approximately 1 percent of the total federal grant to Texas under the Perkins Act and less than 10 percent of the federal grant monies that are projected to be spent on state administration and leadership for Vocational and Applied Technology Education.

Section 5: EVALUATION PROCEDURES AND FINDINGS

The project description for 1991-1992 indicates that regular and frequent formative evaluations would be conducted. The methods specified for these evaluations were (1) providing opportunity for input, criticism, and evaluation by members of the general advisory committee and course-specific advisory groups; (2) in-house evaluation using the expertise of personnel at the EIMC; and (3) bimonthly and quarterly administrative reports to the Director of Vocational Education Programs at the TEA.

Input and Evaluation by Advisory Committees. In August 1991, a series of nine teleconferences were conducted with nine Course-Specific Advisory Groups. Tape recordings of these sessions and notes taken by staff at the EIMC during the conferences were used to guide revisions of the drafts of the Core Performance Standards prior to the October meeting of the General Advisory Committee. During project year 1991-1992, the General Advisory Committee met once in October 1991 to critique content and format of the core performance standards and the first draft of the prototype data collection instrument. The minutes of that meeting show that the committee provided direction for revising and finalizing the set of standards that were taken to school districts for feasibility assessment in November and December of 1991 (see Appendix B).

In-house Evaluations at EIMC. Review of progress on this project by staff of the EIMC at the end of August 1991 revealed that significant delays in the work had been created by the illness of the project manager. Problems caused by these delays were compounded when staff at the TEA determined that the due date for delivery of feasibility-tested core performance standards should be moved from April to January 1992 so as to ensure timely implementation of the evaluation system required by the Perkins Act of 1990. Staff at the EIMC, with advice and consent of TEA's directors of Vocational Education Programs and Vocational Special Needs, accepted the resignation of the project manager in September and began a search for a new project manager. In early October 1991, the new project management team met twice with content area specialists at the EIMC to review the history of the project and obtain guidance from these specialists regarding status of the core performance standards, strategies for conducting the feasibility assessment, and recommendations regarding course-specific standards. Throughout the period November 1991 - June 1992, individual members of the EIMC were consulted for their evaluation and guidance regarding the development of core and course-specific standards and measures of performance.

Progress Reports to the TEA. The written quarterly progress reports are in Appendix G. These reports include discussion of guidance received in monthly meetings with the project director and quarterly meetings with the group of vocational and applied technology education program directors at the TEA. In addition to the written reports and quarterly meetings, project staff participated with the Director of Vocational Education Programs and other personnel at the TEA in meetings at least once a month to review progress and guide the project.

Section 6: CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Conclusions and Recommendations Regarding Core Standards

The three standards approved by the Board for school year 1992-1993 have some strengths and some vulnerabilities. One of the strengths is that the standards are in compliance with the Section 115 of the Perkins Act which says that the system must include a measuring of learning and competency gains, including student progress in the achievement of basic and more advanced academic skills and at least one other measure of competency attainment, job or work skill attainment or enhancement, retention in or completion of secondary school or its equivalent, and/or placement into additional training or education, military service, or employment. Standard number 1, which says that at least 90 percent of students who were enrolled in a coherent sequence of courses invocational and applied technology education will pass the TAAS exit test, specifies a measure of achievement of basic academic skills. Standard number 2, which says that at least 95 percent of 12th grade students who were enrolled in a coherent sequence of courses in vocational and applied technology education programs will demonstrate competency in occupational skills constitutes a standard and measure of performance relative to job or work skill attainment. Standard number 3 sets a standard and specifies measurement of placement into additional training or education (i.e., enrolled in a postsecondary educational institution or enrolled in a registered apprenticeship program or in training related to their vocational education program), military service, or employment (i.e., employed in a paid or unpaid job related to their vocational and applied technology education and training).

Strengths of the core standards approved by the State Board of Education for school year 1992-1993 are that they:

* *meet the requirements of Section 115 of the Perkins Act which says that the system must include a measure of achievement of academic skills and at least one other measure of competency attainment; and*

* *will serve the purpose specified in Section 117 of helping school districts evaluate progress in providing students with experience in and understanding of the industries they are preparing to enter.*

A second strength of the set of three standards and related measures of performance is that they will serve one of the purposes of the required annual evaluation as specified in Section 117 of the Act. They will help school districts evaluate progress in providing students with strong experience in and understanding of the industry they are preparing to enter.

These standards fall short, however, of being useful for two other purposes that are mandated in Section 117. As currently stated, implementation of the core standards and measures of performance will not help school districts to (A) identify and adopt strategies to overcome barriers for individuals who are members of special populations or (B) evaluate progress of individuals who are members of special populations.

As currently stated, the core standards fall short of being useful in helping to focus Federal funds on improving vocational education and, in particular, on improving vocational education and services for members of special populations.

The standards also fall short of helping school districts comply with data gathering and reporting requirements that are not directly connected to the evaluation requirements but that could be advantageously addressed in the statewide system of standards and measures. As was discussed in the introduction to this report, Section 111 of the Act requires, for example, that data be gathered, analyzed, and disseminated on the adequacy and effectiveness of vocational and applied technology education programs in meeting education and employment needs of women, including those who are displaced homemakers and single parents. As currently configured, the standards and measures of performance approved by the State Board of Education for school year 1992-1993 do not provide any direction or assistance with these kinds of related data gathering and reporting requirements.

These observations endorse the conclusion drawn by staff of the TEA when they presented the three standards and related measures of performance to the Board that "other indicators of program effectiveness must be developed."[25] One approach that can be taken toward developing these additional indicators is to review the work accomplished by the General Advisory Committee in developing standards for evaluating outcomes for students who are members of special populations. Number 6 of the core standards and measures of performance that were recommended to the TEA based on the Committee's work and results of the feasibility assessment conducted as part of this project states that members of special populations should be enrolled in vocational and applied technology education courses at rates that are consistent with percentages of those groups of students within the school district. This standard is directly addressed to the issue of access. Number 7 of the standards and measures recommended to the TEA in January of 1992 is addressed to success in vocational and applied technology education programs attained by those who are members of special populations.

If these two standards addressed to access and success for special and targeted populations were to be added to the approved list, the related data collection activity would help the districts to capture other information that the Perkins Act demands. As was noted in the introduction to this report, Section 111 of the Act requires that states (and, therefore, districts) identify the numbers of women and men, students with handicaps, students with economic disadvantage, and students with limited English

proficiency and ensure that needs of such students for participation in vocational and applied technology education programs are being met. Data gathering and computations to compare outcomes against standard for proposals 6 and 7 (see Table 6 in this report). would make this information readily available. For the present, it is recommended that school districts be encouraged to use the data gathering instrument that is included in Appendix D. This instrument, which addresses the three standards and measures approved by the Board gives districts the option of compiling information for targeted groups and special populations and then aggregating results to compare overall performance against the standards.

Another area of concern regarding core standards and measures of performance is that no strategy has yet been proposed for integrating this federally required evaluation into the Academic Excellence Indicator System that is being developed by the TEA in response to sections 21.753 and 21.7531 of the Texas Education Code. State law requires that the set of criteria for evaluating performance of school districts must address the quality and effectiveness of the districts' vocational education programs. At the present time the strategies that have been proposed for meeting this requirement are to measure postsecondary performance in the workplace and/or to monitor percent of students completing approved "preparatory programs" which may or may not include "voc/tech-prep" as an option. It seems wise, therefore, to conclude that particular attention should be given to determining how the annual evaluation of vocational and applied technology programs that school districts must conduct in order to comply with terms of the Perkins Act can be used to meet the state mandate that performance of the districts' vocational education programs be addressed in the set of criteria for district evaluation, accreditation, and determination of exemplary status.

At the present time there is no link between strategies for meeting requirements of the Perkins Act and proposals for meeting requirements of the Texas Education Code that criteria for evaluating performance of school districts must address the quality and effectiveness of the districts' vocational education programs -- i.e., the core standards are not integrated into the AEIS.

Conclusions and Recommendations Regarding Course-Specific Standards and Measures of Performance

In making their recommendations to the State Board of Education regarding core standards and measures of performance for vocational and applied technology education, staff of the TEA indicated that "appropriate performance tests must be developed and validated, to ensure that industry standards are being met."[26] The Student Occupational Competency Achievement Tests (SOCAT) already developed, validated, and periodically

updated by the National Occupational Competency Testing Institute (NOCTI) offer a very positive alternative to the costly and time-intensive business of developing standards from scratch for programs in Texas.

> *The Student Occupational Competency Achievement Tests (SOCAT) that already are used statewide in three states and nationwide in Jobs Corps Centers hold substantial promise as a system for Texas to use to link industry standards, certification of workplace competencies, and specific courses of study in vocational and applied technology education.*

The SOCATs are industry validated, field tested in school districts, performance-based, and criterion-referenced. Because they are in use locally in countless school districts, statewide in at least 3 states, and nationwide in the Job Corps Centers, normative references also are produced in the reports that school districts and students receive when they participate in SOCAT. At the present time, SOCATs are available to match 14 of the 22 Board approved priority or emerging occupations that a young person could expect to enter while still in or just graduated from high school and for 8 of the 13 approved occupations that require postsecondary training but do not require formal apprenticeship or baccalaureate degree. It is therefore recommended that a longitudinal study be initiated in the fall of 1992 to conduct an empirical evaluation of the utility of the SOCAT as a strategy for linking industry standards, certification of workplace competencies, and secondary school-based vocational and applied technology education.

Analysis of the match between available SOCATs, the list of Board approved occupations, and specific courses of study in vocational and applied technology education in Texas indicates that Carpenter's Helper, Computer Operator, Medical Assistant, and Secretary are especially attractive as occupations with which to begin the development of appropriate performance tests to ensure that industry standards are being met. For each of these occupations there is at least one applicable SOCAT and at least one block of two to four vocational and applied technology education courses whose essential elements would prepare the student to demonstrate achievement of necessary skills for being work ready.

For more information regarding...

SOCAT ..... *(800) 334-6283*
Quality Work Force Planning ... *(512) 475-3428*
SOICC ..... *(512) 463-2399*

These occupations also are among those for which the SCANS has published a task list that is cross-walked to the SCANS competencies and foundation skills and qualities. In addition, they are among the 700 occupations for which competency listings, personal skills inventories, and personal interest inventories are maintained in system

used for Quality Work Force Planning in Texas -- i.e., in the data base of the State Occupational Informational Coordinating Committee (SOICC). Each of these four entry level occupations has access to a progressive skills certification system that is industry- or association-based.

Two of these occupations -- medical assistant and secretary -- have career advancement opportunities based on experience in the profession, one -- carpenter's helper -- can progress into a formal apprenticeship, and one -- computer operator -- requires postsecondary training or college education. These occupations therefore are especially attractive as test cases for development and validation of a skills training and certification system that will meet industry needs for a skilled work force and broaden young people's options for making the transition from school to progressively more challenging and rewarding work. Because the SOCATs already are available and because the projected cost for administering them for just these four occupations for secondary vocational and applied technology education programs in Texas is small--i.e., less than $30,000 per year--it is recommended that a pilot study be undertaken to evaluate the utility of the SOCATs and to explore this option for linking industry standards, certification of workplace competencies, and specific courses of study in vocational and applied technology education in secondary schools in Texas.

These conclusions and recommendations regarding course-specific standards are summarized together with those regarding core standards and measures of performance in Table 14. As is noted in Table 14, the specific recommendations that emerge from this study are:

1) Additional indicators of program effectiveness must be developed to meet the requirements of the Perkins Act of 1990, giving particular attention to indicators that will ensure adequate evaluation and feedback to ensure access and success in vocational and applied technology education programs for individuals who are members of special populations;

2) In the interim, school districts can use the prototype data collection instrument that is included in appendix D to collect, analyze, and use data to evaluate program performance relative to the three core standards approved for school year 1992-1993 *and* address data gathering and evaluation requirements regarding program reach and effectiveness for members of targeted groups and special populations; and

3) A pilot study should be conducted to evaluate the utility of the SOCAT as a system of course-specific standards and performance measures to ensure that industry standards are met.

Table 14 Overview of Conclusions and Recommendations

Regarding Core Standards and Measures of Performance...

* In addition to the three standards approved by the Committee of Practitioners and the State Board of Education for school year 1992-1993, other indicators relating to program effectiveness must be developed.

  - Standards approved for 1992-1993 do not directly serve all of the purposes identified in the Perkins Act of 1990 -- e.g., the standards will not be directly useful in helping school districts to identify and adopt strategies to overcome barriers to access and success for individuals who are members of special populations as is mandated in Section 117 of the Act.

  - The standards also fall short of helping school districts comply with data gathering and reporting requirements that are not directly connected to the evaluation requirements but could be advantageously addressed in the statewide system of standards and measures -- e.g., section 111 of the Act requires that data be gathered, analyzed, and disseminated on the adequacy and effectiveness of vocational education programs in meeting education and employment needs of women.

* Strategies for integrating the evaluation that is required by the Perkins Act into TEA's Academic Excellence Indicator System need to be developed in order to meet the State's requirement under section 21.753 of the Texas Education Code quality and effectiveness of the districts' vocational education programs must be addressed in criteria for evaluating performance of school districts.

Regarding Course-Specific Standards and Measures of Performance...

* The Student Occupational Competency Achievement Tests (SOCAT) that already are used statewide in 3 states and nationwide in Jobs Corps Centers hold substantial promise as a system for Texas to use to link industry standards, certification of workplace competencies, and specific courses of study.

* Carpenter's Helper, Computer Operator, Medical Assistant, and Secretary are Board approved priority occupations that are especially attractive for evaluating the utility of the SOCATs for meeting federal and state assessment requirements and for broadening students' options for transition from school to progressively more challenging and more rewarding opportunities in the work force.

END NOTES

1. Department of Education, State Vocational and Applied Technology Education Programs and National Discretionary Programs of Vocational Education, Proposed Rule. *Federal Register*, Vol 56 No. 198, 51448, October 11, 1991.

2. AMERICA 2000: An Education Strategy. (1991) U.S. Department of Education, Washington, D.C. 20202-0498.

3. The Secretary's Commission on Achieving Necessary Skills, *What Work Requires of Schools: A SCANS Report for AMERICA 2000.* (1991), U.S. Department of Labor, 200 Constitution Avenue, N.W., Washington, D.C. 20210.

4. *America's choice: High skills or low wages* (1990). The Report of the Commission on the Skills of the American Workforce, National Center on Education and the Economy, 39 State Street, Suite 500, Rochester, New York 14614.

5. *Skills and Tasks for Jobs: A SCANS Report for America 2000.* (1992) U.S. Department of Labor Secretary's Commission on Achieving Necessary Skills, 200 Constitution Avenue, N.W., Washington, D.C. 20210.

6. "Report ducks major issues: Final SCANS report urges schools to 'reinvent education.'" *Vocational Education Weekly*, Vol. V No. 2, April 13, 1992, published by the American Vocational Association, 1410 Kings St. Alexandria,VA 22314 (703) 683-3111.

7. *Texas Quality Work Force Planning.* (1990). A Tri-Agency Initiative of the Texas Education Agency, Texas Higher Education Coordinating Board, and Texas Department of Commerce. For copies contact the Texas Education Agency, Quality Work Force Planning Unit (512) 475-3428.

8. State Plan for Vocational and Applied Technology Education: Fiscal Years 1992-1994. Submitted by the Texas Education Agency to the United States Secretary of Education under provisions of the Carl D. Perkins Vocational and Applied Technology Education Act, Section 1.6.

9. Texas Council on Vocational Education. *Demanding Excellence, Rewarding Quality*: Performance Indicator Project. (1991). Copies of the report are available from the Council: P.O. Box 1886, Austin, Texas 78767 (512) 463-5490.

10. Texas Council on Vocational Education, 1991, op cit, page 8.

11. Meno, L. R., Commissioner of Education, Texas Education Agency. *A plan for improved student achievement accountability*, presented to the State Board of Education, January 9, 1992.

12. Adoption of Student Assessment Plan. Minutes of the State Board of Education, March 13, 1992.

13. Roberts-Gray, C. *Research and Development of Performance Standards for Selected Vocational Education Programs*. 1991. Final Report sponsored cooperatively by the Texas Education Agency and the University of Texas at Austin Extension Instruction and Materials Center Division of Continuing Education.

14. The High Success Network, 1991 (op cit).

15. Final report ducks major issues. Final SCANS report urges schools to 'reinvent education', 1992, op cit.

16. "Obstacles arise to creating skill standards," *Vocational Education Weekly*, Vol V, No. 2, Monday, April 13, 1992. Published by the American Vocational Association, 1410 Kings St., Alexandria, VA 22314.

17. *The* High Success Program on Outcome-Based Education, 1991, The High Success Network, William G. Spady, Director, P. O. Box 1630, Eagle, CO 81631 (303) 524-9660.

18. *Discussion of Proposed Core Standards and Measures for Vocational and Applied Technology Education*. Minutes of the meeting State Board of Education, April 10, 1992.

19. *Occupational Outlook Handbook*

20. The Resource Group, *Training Options*, 1991. Report submitted to the Austin/Travis County Private Industry Council, Demonstration of Team Case Management to Provide Job Training Activities for the Homeless, Grant No. 99-9-3551-79-117-02.

21. *State Board of Education Rules for Curriculum*. updated through July 1988, Texas Education Agency, 1701 North Congress Avenue, Austin, Texas 78701-1494.

22. Discussion of Proposed Core Standards and Measures for Vocational and Applied Technology Education, Minutes of the meeting of the State Board of Education, April 10, 1992, op cit.

23. *Occupational Outlook Handbook: 1992-93 Edition*. Bulletin 2400 (1992). U. S. Department of Labor, Bureau of Labor Statistics, Washington DC 20212.

24. Occupational Demand and Formal Occupational Supply Report. Attachment to the *State Plan for Vocational and Applied Technology Education, Fiscal Years 1992-1994*, op cit.

25. Minutes of the meeting of the State Board of Education, April 11, 1992, op cit.

26. Minutes of the State Board of Education, April 1992, op cit.

APPENDIX A:
Abstract of Workplan for Project Year 1991-1992

PROJECT DESCRIPTION ABSTRACT
1991-92

Objectives

This project will have two main objectives. This first will be to continue the development of performance standards for sequences of vocational courses. The second will be to conduct a feasibility study of the core performance standards to ensure that those standards are clearly defined, cost efficient, manageable in number, relatively easy to measure, timely, goal oriented, attainable yet credible, and focused on product rather than process.

Procedures

A general advisory committee will review and approve the conduct of both major portions of this project. This project will examine courses other than those considered during the 1990-91 project and determine for which courses, if any, additional performance standards need to be developed. A feasibility study will be conducted to determine whether the core standards developed during the 1990-91 project are realistic, and adjustments will be made, if necessary; this study will greatly enhance the process of adopting and implementing the standards. Course-specific performance standards will assist local administrators in the evaluation of their programs. All standards will be clearly defined, cost efficient, manageable in number, relatively easy to measure, timely, goal oriented, attainable yet credible, and focused on product rather than process.

Product(s) to Be Delivered

Three final products will be developed: (1) course-specific performance standards for those vocational courses for which they are needed; (2) a feasibility study of the core performance standards developed during the 1990-91 school year; and (3) a data-gathering instrument to be used in the feasibility study. The instrument could be used by vocational administrators in local school districts in data collection for their districts' evaluation required under the performance standards. One (1) camera-ready copy and 100 additional copies of the performance standards, the data-gathering instrument, and the results of the feasibility study will be produced.

Quality Control of Product(s)

Regular and frequent formative evaluations will be conducted during the development of the performance standards and the feasiblity study. Advisory and validation committees—composed of individuals with experience and expertise appropriate to this specific project—will be formed. A general advisory committee and numerous course-specific advisory groups will provide ample opportunity for input, criticism, and evaluation. This process will also improve acceptance of the final product by teachers and administrators. Regular and comprehensive in-house evaluation will take place during the course of the project using the expertise of EIMC. Bimonthly reports with copies of the products being developed, quarterly adminstrative reports, and a comprehensive final report will be submitted to the Director of Vocational Education Programs at the Texas Education Agency.

APPENDIX B:
Minutes of Advisory Committee Meeting, October 1991

PERFORMANCE STANDARDS FOR
VOCATIONAL AND APPLIED TECHNOLOGY EDUCATION

First Advisory Committee Meeting
October 21, 1991

The first advisory committee meeting was held on Monday, October 21st from 10:00 a.m. to 2:00 p.m. at the Thompson Conference Center on the University of Texas Campus. A list of the Members in attendence is attached.

Dr. Barbara Selke-Kern, Director of Materials Development, Extension Instruction and Materials Center (EIMC), opened the meeting with welcoming remarks. She informed the committee of the change in Project Managers. Richard Bouton, unfortunately, is experiencing health problems which has prohibited him from completing this project. She introduced the new Project Manager, Dr. Cindy Roberts-Gray. Dr. Cindy Roberts-Gray gave a brief update on the project and discussed her collaboration with Richard. She had met with him the week prior to ensure that his previous work and ideas were incorporated into her subsequent work on the project.

Dr. Roberts-Gray presented the Core Performance Standards which needed to be finalized by the close of the afternoon meeting. Completion of the standards was important because they will be tested in visits to school district which will take place in November and early December. She explained that the purpose of the feasibility study was to determine if the criteria in the standards were reasonable and realistic and if the information requested could be obtained from the districts. The final Core Standards will be produced in mid-January and the Course-Specific Standards would be finalized in the spring of 1992. Dr. Roberts-Gray believes that these will take the form of amendments and addenda to the Core Standards.

Discussion and revision of each of the eleven standards followed.

Standard 1: The question arose as to what constitutes a "coherent sequence" and whether this sequence should be made up of courses across programs or only program specific courses.

Sylvia Clark, Texas Education Agency, believes that a sequence of broad to specific courses constitutes a sequence and that one already exists.

Barbara Terrell, Director of Programs, Health Occupations Education, felt that there is no coherent sequence of courses.

Robert Patterson, Director of Vocational Programs from the Texas Education Agency, reminded the Members that the law and the annual application requires a coherent sequence of courses. Mr. Patterson suggested that a sequence of courses should be at least 4 credits. He also suggested that districts should begin to offer 1 sequence and expand. Many small schools do not have these in place but should begin to work towards developing them. Due to these new requirements a longitudinal study of the improvements should be considered.

A discussion on the necessity of the use of the TAAS test to indicate competency attainment was initiated by Will Reese, Texas Council on Vocational Education. It was suggested that a pre-, post-test be considered or another academic indicator be used.

It was decided that Standard 1 would be labeled under development until the feasibility study was conducted.

Standard 2: The timing of the evaluations was brought into discussion and it was determined that they will be conducted at the end of each academic year.

Agreement was reached that the requirement of 4.5 state-approved units of credit to be obtained per year by students enrolled in two semesters of vocational education courses was insufficient. The concensus was to change 4.5 to 5.5 units of state approved required and/or elective units of credit.

Sandrea Marvel, retired Vocational Director, Wichita Falls Independent School District, recommended that the evaluation to be attentive to whether districts which have 7 period days provide a loophole for the 5.5 unit credit requirements.

Standard 3 and 4: Few wording changes were suggested.

Standard 5 and 6: Few wording changes were suggested. Dr. Roberts-Gray suggested the possibility of reviewing attendence records as a method for collecting data on these Standards.

Standard 8: The decision was reached to modify this standard completely. The revised version of this and all other standards are included in the attachments.

Standard 9, 10, and 11: Few wording changes were suggested.

After all Standards were discussed, Dr. Roberts-Gray told Members that the ammended version of the Core Standards would be mailed within two days of the meeting for their approval and comments.

The meeting was adjorned at 2:00 p.m.

APPENDIX C:
SCANS Competencies and Summary of SCANS Task Lists

Skills and Tasks for Jobs
Cross-walk to the SCANS Competencies and Foundation
"Most Critical" skills and tasks are listed by their rank ordering
taken from
Skills and Tasks for Jobs: A SCANS Report for AMERICA 2000
U.S. Department of Labor, February 1992

OCCUPATION	COMPETENCIES	FOUNDATION
Carpenter	C18, C09, C15, C19, C10, C07	F13, F03, F05, F04, F01, F17
Computer Operator	C11, C01, C09, C15, C20, C19, C16, C10, C08	F13, F01, F02, F09, F17, F05, F06, F11
Medical Assistant	C09, C01, C11, C06, C05, C15, C19, C07	F17, F13, F14, F15, F05, F11, F01, F16
Secretary	C09, C01, C11, C08, C05, C14, C15, C06, C07, C19	F05, F02, F06, F01, F13, F08

The SCANS report includes the task analysis for a total of 50 jobs.

Table 2-1. Definitions of Competencies and Foundation Skills

Competencies

Resources

C1 Allocates Time - Selects relevant, goal-related activities, ranks them in order of importance, allocates time to activities, and understands, prepares, and follows schedules. Competent performance in allocating time includes properly identifying tasks to be completed; ranking tasks in order of importance; developing and following an effective, workable schedule based on accurate estimates of such things as importance of tasks, time to complete tasks, time available for completion, and task deadlines; avoiding wasting time; and accurately evaluating and adjusting a schedule.

C2 Allocates Money - Uses or prepares budgets, including making cost and revenue forecasts, keeps detailed records to track budget performance, and makes appropriate adjustments. Competent performance in allocating money includes accurately preparing and using a budget according to a consistent and orderly accounting method; accurately calculating future budgetary needs based on projected costs and revenues; accurately tracking the extent to which actual costs and revenues differ from the estimated budget, and taking appropriate and effective actions.

C3 Allocates Material and Facility Resources - Acquires, stores, and distributes materials, supplies, parts, equipment, space, or final products in order to make the best use of them. Competent performance in allocating material and facility resources includes carefully planning the steps involved in the acquisition, storage, and distribution of resources; safely and efficiently acquiring, transporting or storing them; maintaining them in good condition; and distributing them to the end user.

C4 Allocates Human Resources - Assesses knowledge and skills and distributes work accordingly, evaluates performance and provides feedback. Competent performance in allocating human resources includes accurately assessing people's knowledge, skills, abilities, and potential; identifying present and future workload; making effective matches between individual talents and workload; and actively monitoring performance and providing feedback.

Information

C5 Acquires and Evaluates Information - Identifies need for data, obtains them from existing sources or creates them, and evaluates their relevance and accuracy. Competently performing the tasks of acquiring data and evaluating information

includes posing analytic questions to determine specific information needs; selecting possible information and evaluating its appropriateness; and determining when new information must be created.

C6 Organizes and Maintains Information - Organizes, processes, and maintains written or computerized records and other forms of information in a systematic fashion. Competently performing the tasks of organizing and maintaining information includes understanding and organizing information from computer, visual, oral and physical sources in readily accessible formats, such as computerized data bases, spreadsheets, microfiche, video disks, paper files, etc.; when necessary, transforming data into different formats in order to organize them by the application of various methods such as sorting, classifying, or more formal methods.

C7 Interprets and Communicates Information - Selects and analyzes information and communicates the results to others using oral, written, graphic, pictorial, or multi-media methods. Competently performing the tasks of communicating and interpreting information to others includes determining information to be communicated; identifying the best methods to present information (e.g., overheads, handouts); if necessary, converting to desired format and conveying information to others through a variety of means including oral presentation, written communication, etc.

C8 Uses Computers to Process Information - Employs computers to acquire, organize, analyze, and communicate information. Competently using computers to process information includes entering, modifying, retrieving, storing, and verifying data and other information; choosing format for display (e.g., line graphs, bar graphs, tables, pie charts, narrative); and ensuring the accurate conversion of information into the chosen format.

Interpersonal

C9 Participates as a Member of a Team - Works cooperatively with others and contributes to group with ideas, suggestions, and effort. Demonstrating competence in participating as a member of a team includes doing own share of tasks necessary to complete a project; encouraging team members by listening and responding appropriately to their contributions; building on individual team members' strengths; resolving differences for the benefit of the team; taking personal responsibility for accomplishing goals; and responsibly challenging existing procedures, policies, or authorities.

C10 Teaches Others - Helps others learn. Demonstrating competence in teaching others includes helping others to apply related concepts and theories to tasks through coaching or other means; identifying training needs; conveying job

information to allow others to see its applicability and relevance to tasks; and assessing performance and providing constructive feedback/reinforcement.

C11 Serves Clients/Customers - Works and communicates with clients and customers to satisfy their expectations. Demonstrating competence in serving clients and customers includes actively listening to customers to avoid misunderstandings and identifying needs; communicating in a positive manner especially when handling complaints or conflict; efficiently obtaining additional resources to satisfy client needs.

C12 Exercises Leadership - Communicates thoughts, feelings, and ideas to justify a position, encourages, persuades, convinces, or otherwise motivates an individual or groups, including responsibly challenging existing procedures, policies, or authority. Demonstrating competence in exercising leadership includes making positive use of the rules/values followed by others; justifying a position logically and appropriately; establishing credibility through competence and integrity; and taking minority viewpoints into consideration.

C13 Negotiates to Arrive at a Decision - Works toward an agreement that may involve exchanging specific resources or resolving divergent interests. Demonstrating competence in negotiating to arrive at a decision involves researching opposition and the history of the conflict; setting realistic and attainable goals; presenting facts and arguments; listening to and reflecting on what has been said; clarifying problems and resolving conflicts; adjusting quickly to new facts/ideas; proposing and examining possible options; and making reasonable compromises.

C14 Works with Cultural Diversity - Works well with men and women and with a variety of ethnic, social, or educational backgrounds. Demonstrating competence in working with cultural diversity involves understanding one's own culture and those of others and how they differ; respecting the rights of others while helping them make cultural adjustments where necessary; basing impressions on individual performance, not on stereotypes; and understanding concerns of members of other ethnic and gender groups.

Systems

C15 Understands Systems - Knows how social, organizational, and technological systems work and operates effectively within them. Demonstrating competence in understanding systems involves knowing how a system's structures relate to goals; responding to the demands of the system/organization; knowing the right people to ask for information and where to get resources; and functioning within the formal and informal codes of the social/organizational system.

C16 Monitors and Corrects Performance - Distinguishes trends, predicts impact of actions on system operations, diagnoses deviations in the function of a system/organization, and takes necessary action to correct performance. Demonstrating competence in monitoring and correcting performance includes identifying trends and gathering needed information about how the system is intended to function; detecting deviations from system's intended purpose; troubleshooting the system; and making changes to the system to rectify system functioning and to ensure quality of product.

C17 Improves and Designs Systems - Makes suggestions to modify existing systems to improve products or services and develops new or alternative systems. Demonstrating competence in improving or designing systems involves making suggestions for improving the functioning of the system/organization; recommending alternative system designs based on relevant feedback; and responsibly challenging the status quo to benefit the larger system.

Technology

C18 Selects Technology - Judges which set of procedures, tools, or machines, including computers and their programs, will produce the desired results. Demonstrating competence in selecting technology includes determining desired outcomes and applicable constraints; visualizing the necessary methods and applicable technology; evaluating specifications; and judging which machine or tool will produce the desired results.

C19 Applies Technology to Task - Understands the overall intent and the proper procedures for setting up and operating machines, including computers and their programming systems. Demonstrating competence in how to apply technology to task includes understanding how different parts of machines interact and how machines interact with broader production systems; on occasion installing machines including computers; setting up machines or systems of machines efficiently to get desired results; accurately interpreting machine output; and detecting errors from program output.

C20 Maintains and Troubleshoots Technology - Prevents, identifies, or solves problems in machines, computers, and other technologies. Demonstrating competence in maintaining and troubleshooting technology includes identifying, understanding, and performing routine preventative maintenance and service on technology; detecting more serious problems; generating workable solutions to correct deviations; and recognizing when to get additional help.

Foundation Skills

Basic Skills

F1 Reading - Locates, understands, and interprets written information in prose and documents—including manuals, graphs, and schedules—to perform tasks; learns from text by determining the main idea or essential message; identifies relevant details, facts, and specifications; infers or locates the meaning of unknown or technical vocabulary; and judges the accuracy, appropriateness, style, and plausibility of reports, proposals, or theories of other writers.

F2 Writing - Communicates thoughts, ideas, information, and messages in writing; records information completely and accurately; composes and creates documents such as letters, directions, manuals, reports, proposals, graphs, flow-charts; uses language, style, organization, and format appropriate to the subject matter, purpose, and audience; includes supporting documentation and attends to level of detail; and checks, edits, and revises for correct information, appropriate emphasis, form, grammar, spelling, and punctuation.

F3 Arithmetic - Performs basic computations; uses basic numerical concepts such as whole numbers and percentages in practical situations; makes reasonable estimates of arithmetic results without a calculator; and uses tables, graphs, diagrams, and charts to obtain or convey quantitative information.

F4 Mathematics - Approaches practical problems by choosing appropriately from a variety of mathematical techniques; uses quantitative data to construct logical explanations for real world situations; expresses mathematical ideas and concepts orally and in writing; and understands the role of chance in the occurrence and prediction of events. (See footnote on page 2-3.)

F5 Listening - Receives, attends to, interprets, and responds to verbal messages and other cues such as body language in ways that are appropriate to the purpose; for example, to comprehend, to learn, to critically evaluate, to appreciate, or to support the speaker.

F6 Speaking - Organizes ideas and communicates oral messages appropriate to listeners and situations; participates in conversation, discussion, and group presentations; selects an appropriate medium for conveying a message; uses verbal language and other cues such as body language appropriate in style, tone, and level of complexity to the audience and the occasion; speaks clearly and communicates a message; understands and responds to listener feedback; and asks questions when needed.

Thinking Skills

F7 Creative Thinking - Uses imagination freely, combines ideas or information in new ways, makes connections between seemingly unrelated ideas, and reshapes goals in ways that reveal new possibilities.

F8 Decision Making - Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative.

F9 Problem Solving - Recognizes that a problem exists (i.e., there is a discrepancy between what is and what should or could be); identifies possible reasons for the discrepancy; devises and implements a plan of action to resolve it; evaluates and monitors progress; and revises plan as indicated by findings.

F10 Seeing Things in the Mind's Eye - Organizes and processes symbols, pictures, graphs, objects or other information; for example, sees a building from a blueprint, a system's operation from schematics, the flow of work activities from narrative descriptions, or the taste of food from reading a recipe.

F11 Knowing How To Learn - Recognizes and can use learning techniques to apply and adapt new knowledge and skills in both familiar and changing situations and is aware of learning tools such as personal learning styles (visual, aural, etc.), formal learning strategies (note taking or clustering items that share some characteristics), and informal learning strategies (awareness of unidentified false assumptions that may lead to faulty conclusions). (See footnote on page 2-3.)

F12 Reasoning - Discovers a rule or principle underlying the relationship between two or more objects and applies it in solving a problem; uses logic to draw conclusions from available information; extracts rules or principles from a set of objects or written text; applies rules and principles to a new situation or determines which conclusions are correct when given a set of facts and a set of conclusions. (See footnote on page 2-3.)

Personal Qualities

F13 Responsibility - Exerts a high level of effort and perseverance toward goal attainment; works hard to become excellent at doing tasks by setting high standards, paying attention to details, working well and displaying a high level of concentration even when assigned an unpleasant task; and displays high standards of attendance, punctuality, enthusiasm, vitality, and optimism in approaching and completing tasks.

F14 Self-Esteem - Believes in own self-worth and maintains a positive view of self; demonstrates knowledge of own skills and abilities; is aware of impact on others;

and knows own emotional capacity and needs and how to address them. (See footnote on page 2-3.)

F15 Social - Demonstrates understanding, friendliness, adaptability, empathy and politeness in new and on-going group settings; asserts self in familiar and unfamiliar social situations; relates well to others; responds appropriately as the situation requires; and takes an interest in what others say and do.

F16 Self-Management - Assesses own knowledge, skills, and abilities accurately; sets well-defined and realistic personal goals; monitors progress toward goal attainment and motivates self through goal achievement; exhibits self-control and responds to feedback unemotionally and non-defensively; and is a "self-starter."

F17 Integrity/Honesty - Can be trusted; recognizes when faced with making a decision or exhibiting behavior that may break with commonly-held personal or societal values; understands the impact of violating these beliefs and codes on an organization, self, and others; and chooses an ethical course of action. (See footnote on page 2-3.)

APPENDIX D:
Prototype Data Collection Instrument

CORE PERFORMANCE STANDARDS FOR VOCATIONAL AND APPLIED TECHNOLOGY EDUCATION
for secondary school programs in Texas
Data Collection Instrument

This document was prepared to assist school districts in conducting annual evaluation of vocational and applied technology education programs.

WHY? Beginning with school year 1992-1993, annual self-evaluation of vocational and applied technology education program performance is required for all districts receiving funding through the Carl D. Perkins Vocational and Applied Technology Education Act of 1990. The purpose of the evaluation is to (a) ensure that vocational and applied technology education programs provide students with strong experience in and understanding of the industry they are preparing to enter and (b) identify and adopt strategies to overcome barriers that limit access or success in such programs for individuals who are members of targeted groups or special populations.

HOW? The pages of this document provide a format and suggestions for assembling information to measure performance relative to core standards and organize the data so that it will be useful in developing local program plans.

WHAT? The standards in this document were adopted by the State Board of Education in 1992.

WHERE? The district conducts is own evaluation and develops its own program improvement plan. The law says the plan must be reviewed annually and revised by the Texas Education Agency until the district fulfills the standards for more than one year.

WHO? The district's vocational and applied technology education program administrators are to conduct the evaluation based on a statewide system of core standards and measures of performance.

WHEN? The evaluation is to be completed annually.

Note: Throughout this document AG=Agricultural Education, HE=Home Economics, HO=Health Occupations, IT=Industrial Technology, ME=Marketing Education, OE=Office Education, and TI=Trade and Industrial Education

Evaluation is for school year_____

Standard	Suggested Data Source	Calculation Steps	Performance Evaluation
1 At least 90 percent of students in grades 9 through 11 who were enrolled in a coherent sequence of courses in vocational and applied technology education will pass the TAAS exit exam.	• list of students enrolled in a coherent sequence of courses in vocational education programs	1.1. Enter the numbers of 12th grade students who were ever enrolled in a coherent sequence of courses in vocational and applied technology programs.	AG__ HE__ HO__ IT__ ME__ OE__ TI__
	• TAAS results	1.2. Of these, how many were: a. handicapped? b. LEP? c. economically disadvantaged? d. none of the above? e. males? f. females? g. single parent and/or pregnant?	AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__
		1.3. How many of these students counted on lines 1.2a-1.2g passed TAAS? a. handicapped b. LEP c. economically disadvantaged d. none of the above e. males f. females g. single parent and/or pregnant	AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__

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Standard	Suggested Data Source	Calculation Steps	Performance Evaluation
Standard 1 (continued) *Note: Use this standard to evaluate the programs' effectiveness in promoting achievement of basic and advanced academic skills.*		1.4. Divide line 1.2a-1.2g by line corresponding lines 1.3a-1.3g and enter results for each program area for: a. handicapped b. LEP c. economically disadvantaged d. none of the above e. males f. females g. single parent and/or pregnant	 AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__
		1.5. Add lines 1.2e and 1.2f and enter the sums by program.	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		1.6. Divide line 1.5 by line 1.1 and enter results by program.	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		1.7. When results on line 1.6 are greater than .89, the standard is met. Put a check mark on line 1.7 for each program that met the standard. If results on line 1.6 are less than .90, the standard has not been met. Circle any result on line 1.6 and on lines 1.4a-1.4g that is less than .89 for easy reference in setting objectives for the local program improvement plan.	AG__ HE__ HO__ IT__ ME__ OE__ TI__ Check mark signifies Standard 1 was met.

Standard	Suggested Data Source	Calculation Steps	Performance Evaluation
2 At least 95 percent of 12th grade students who were enrolled in a coherent sequence of courses in vocational and applied technology education programs a. obtained a certification of competency by an accepted licensing or certification agency, OR b. successfully completed a validated test of occupational competency, OR c. demonstrated completion and competency in the essential elements for the coherent sequence of courses.	* lines 1.1 and 1.2 under standard number 1 on page 1 of this data collection instrument * records of certifications and/or occupational competency test scores * printout of grades assigned to 12th graders enrolled in vocational education courses * data maintained by instructors and/or counselors	2.1. How many students obtained certification of competency by an accepted licensing or certification agency? a. handicapped b. LEP c. economically disadvantaged d. none of the above e. males f. females g. single parent and/or pregnant 2.2. Other than those counted on lines 2.1a-2.1g, how many students successfully completed a validated test of occupational competency? a. handicapped b. LEP c. economically disadvantaged d. none of the above e. males f. females g. single parents	AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__

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Standard	Suggested Data Source	Calculation Steps	Performance Evaluation
Standard 2 (continued)		2.3. Other than those counted on lines 2.1a-2.1g and 2.2a-2.2g, how many students demonstrated completion and competency in the essential elements for the coherent sequence of courses?	
		a. handicapped	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		b. LEP	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		c. economically disadvantaged	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		d. none of the above	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		e. males	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		f. females	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		g. single parent and/or pregnant	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		2.4. Add lines 2.1a, 2.2a, 2.3a and enter the result on line 2.4a. Then add lines 2.1b, 2.2b, 2.3b and enter the result on line 2.4b, and so on to complete lines 2.4a-2.4g for each program.	
		a. handicapped	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		b. LEP	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		c. economically disadvantaged	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		d. none of the above	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		e. males	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		f. females	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		g. single parent and/or pregnant	AG__ HE__ HO__ IT__ ME__ OE__ TI__

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Standard	Suggested Data Source	Calculation Steps	Performance Evaluation
Standard 2 (continued) *Note: Use this standard to assess programs' effectiveness in promoting job or work skill attainment or enhancement.*		2.5. Divide lines 2.4a-2.4g by corresponding lines 1.2a-1.2g under standard number 1 (see page 1 of this document) and enter results on lines 2.5a-2.5g by program.	
		a. handicapped	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		b. LEP	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		c. economically disadvantaged	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		d. none of the above	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		e. males	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		f. females	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		g. single parent and/or pregnant	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		2.6. Add lines 2.4e and 2.4f and enter the results by program.	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		2.7. Divide line 2.6 by line 1.1 under Standard number 1 (see page 1 of this document) and enter the result by program.	AG__ HE__ HO__ IT__ ME__ OE__ TI__
		2.8. When results on line 2.7 are greater than .94, this standard is met. Place a check mark on line 2.8 for each program that met the standard. If the result on line 2.7 is less than .95, the standard has not been met. Circle any result on line 2.7 and on lines 2.5a-2.5h that is less than .95 for easy reference in setting objectives for the local program improvement plan.	AG__ HE__ HO__ IT__ ME__ OE__ TI__ Check mark signifies that the standard was met.

Standard	Suggested Data Source	Calculation Steps	Performance Evaluation
3 At the one-year follow-up, 75 percent of students who earned their high school diploma after having completed a coherent sequence of courses in a vocational and applied technology education were: a. enrolled in a post-secondary educational institution; OR b. enrolled in a registered apprenticeship program; OR c. in other training related to their vocational education program; OR d. in military service; OR e. employed in a paid or unpaid job related to their vocational education and training. *Note: Use this standard to assess programs' effectiveness in promoting placement into additional training, education, military service, or employment.*	• Vocational Secondary Education Follow-up Report	3.1. Enter number of completers of vocational and applied technology education programs in the year preceding this. 3.2. At the follow-up, how many of these students were: a. enrolled at a post-secondary educational institution? b. enrolled in a registered apprenticeship program? c. in other training related to their program? d. in military service? e. employed in a paid or unpaid job related to their training? 3.3, Add lines 3.2a, 3.2b, 3.2c, 3.2d, & 3.2e. 3.4. Divide line 3.3 by line 3.1. 3.5. When the result is greater than .74, this standard is met. Put a check mark for each program that met the standard. If line 3.4 is less than .75, the standard is not met. Circle results on line 3.4 that are less than .75 for easy reference in setting objectives for the local program improvement plan.	AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ AG__ HE__ HO__ IT__ ME__ OE__ TI__ Check mark signifies the standard was met.

APPENDIX E:
Occupations Worksheet

OCCUPATION = title as approved by State Board of Education
CAT = categorized by amount of training/experience required from least to most
COMMENTS = notes from Occupational Outlook Handbook
DEMAND = number of openings expected annually as shown in appendix to State Plan
FROM 2v = "supply" expected from secondary vocational and applied technology education
SUPPLY = total projected supply
%2vt = proportion of supply expected from secondary vocational and applied technology
SOCAT = name of student occupational competency achievement test that is available
socat$ = projected cost per student to administer SOCAT
COST = FROM 2v x socat$ (i.e., cost to adminster SOCAT if all 2v take the test)
SCANS = shows whether or not SCANS developed list of tasks and skills for the job
CERTIF = agency that provides non-education based assessment and/or skill certification

OCCUPATION	CAT	COMMENTS	DEMAND	FROM 2v	SUPPLY	%2vt	SOCAT	socat$	COST	SCANS	CERTIF
adjustment clerks	4	requires college degr	912	542	808	0.67			0		
auto mechanics	2	post-secondary recomm	1942	4332	7484	0.58	auto mechanics	19.75	85557		NATEF
bill & account colle	4	usually college grad	765	0	255	0			0		
billing clerks	1	usually OJT	822	54	4301	0.01	business data pro	11.50	621		
business service age	4	usually require colle	585	0	5662	0			0		
carpenter	3	apprenticeship > 4 yr	3092	1409	2618	0.54			0	yes	
carpenter's helper	1	OJT	494	950	1490	0.64	carpentry	20.75	19713		
child care worker	2	low wage; prefer coll	3973	2468	2892	0.85	child care servic	10.50	25914		CDA
computer operators	2	usually some post sec	742	1164	8828	0.13	computer & inform	12.50	14550	yes	ICCP
computer programmers	2	usually some college	2358	3075	5134	0.61	computer programm	12.50	38438		
corrections officers	5	must be 21	786	1040	4409	0.24			0		
dental assistants	0	requires congenial pe	435	215	878	0.24	dental assisting	12.50	2688	yes	ADA
diesel mechanics	1	usually OJT	1098	4911	7619	0.64	diesel engine mec	15.50	76121		ASE
drafters	2	usually some post sec	751	1213	3136	0.39	drafting	10.50	12737		
electric powerline i	3	apprenticeship	201	416	1192	0.35			0	yes	
electrical/electroni	2	prefer associate degr	1216	1139	10074	0.11	electronic techno	11.50	13099		
electrician	3	apprenticeship>4yrs	1288	1450	3054	0.47	industrial/construction e		0	yes	
electrician's helper	1		284	272	1142	0.24	electrical occupa	37.70	10254		
elementary teachers	4	college grad	4307	0	4251	0			0		
first line superviso	5	not entry level jobs							0	yes	
food service mgr	2	aa or college grad	1726	7893	15631	0.51	food production,	15.55	122736	yes	
gardners/groundskeep	0	doesn't require diplo	5157	58	177	0.33			0		State
industrial truck op	5	probably must be 21	481	0	36	0			0		
insurance sales	4	prefer college grad	2511	9	3753	0			0		State
legal secretary	1		803	126	318	0.41			0		
licensed practical n	2	state approved lpn pr	3894	0	6938	0	practical nursing	20.00	0	yes	
machinists	2	although most prefer	679	255	496	0.51	machine trades	32.50	8288		
management support	2		1141	0	2123	0			0		
managers, other	4	probably college grad	10487	0	4232	0			0		
mechanics' helper	1		577	3600	5854	0.61			0		
medical assistants	1		759	99	4685	0.02	medical assisting	10.50	1040	yes	Nation
medical secretary	1		640	171	560	0.31			0		
other construction h	1		148	7	132	0.05	building construc	20.50	144		
other engineering te	2	prefer associate degr	572	0	769	0			0		

other protective ser	1	fire fighter,guard							0		
other secretaries	1		8689	161	394	0.41	general secretari	11.50	1852	yes	PSI
painters/paper hange	3	apprenticeship	1328	492	1350	0.36	painting & decora	15.50	7626		
personnel managers	4	college grad	629	0	644	0			0		
personnel specialist	4	college grad	685	0	16387	0			0	yes	
plumbers/pipefitters	3	apprenticeship	1154	1088	2779	0.39			0		
plumber's helpers	1		204	2	114	0.02	plumbing	22.50	45		
police patrol office	5	must be 21	813	0	569	0			0	yes	
preschool teachers	2	postsecondary require	1704	0	4311	0			0		
production clerks	1	typing,filing,communi	634	178	1418	0.13	production agricu	15.65	2786		
property/real estate	4	college grad	843	0	5696	0			0		
radiologic technicia	2	usually some post sec	562	1267	2084	0.61			0		CAHEA
receptionists	0		2194	9580	15683	0.61			0		
registered nurses	4	school of nursing	5919	0	4248	0			0	yes	
sales rep, wholesale	4	prefer college grad	3939	73	205	0.36			0	yes	
salespersons, parts	0	no formal training re	1092	787	1283	0.61			0	yes	
school bus driver	5	requires up to 1 week	1359	2	753	0			0		
social worker	4	college grad	996	0	6898	0			0		
special ed teacher	4	college grad	1251	0	540	0			0		
stock clerks,sales f	0	no formal training re	4736	113	461	0.25			0		
systems analyst,EDP	4	BA,BS	1325	1164	6186	0.19			0		
tellers	5	usually older;from ot	781	0	2630	0			0	yes	
truck drivers	5	must be 21	9748	2	753	0			0	yes	
welders & cutters	1		7545	894	1973	0.45	welding	16.00	14304		
word processing typi	1		876	4928	5477	0.91	general office	11.50	56672		
maintenance repairer:	1	usually self-employed	278	857	4168	0.21	home entertainmen	20.50	17569		
maintenance repairer:	1		175	5682	9665	0.59	heavy equipment m	10.50	59661		
maintenance repairer:	1		24	58	333	0.17	small engine repa	16.95	983		
maintenance repairer:a	1		171	525	764	0.69	appliance repair	13.50	7088	yes	
maintenance repairer:a	1	generally 3-4 years 0	713	4269	6936	0.62	auto body	34.85	148775		ASE
other health: home hea	1	new law requires trai	1799	524	1768	0.31	home health aide	10.50	5502		NHC
									754757		

APPENDIX F:
Tables Matching SOCATs to Essential Elements for Specific Courses

BILLING CLERK
CARPENTER'S HELPER
CHILD CARE WORKER
COMPUTER OPERATOR
DENTAL ASSISTANT
DIESEL MECHANIC
DRAFTER
ELECTRICIAN'S HELPER
MACHINIST
MAINTENANCE REPAIRER: Small Engine
MEDICAL ASSISTANT
OTHER CONSTRUCTION HELPER
OTHER HEALTH WORKER: Home Health Aide
OTHER SECRETARIES
PLUMBER'S HELPER
PRODUCTION CLERK
WELDERS & CUTTERS
WORD PROCESSING TYPIST

Business Data Processing	BILLING CLERKS
Written Test - 3 hrs 168 items	Specific courses & eei
1 general software applications	E1
2 systems/computer programming	E1&4
3 computer literacy	E1
4 computer operations	E1c
5 business related computer functions	E5&6
Performance Test - 3.25 $1.00	
1 backup diskette	E2
2 use of word processing,spreadsheet...	
& database packages	
E=Business Computer Applications I	

Carpentry - 5.33 hrs	
Written Test - 3 hrs 153 items	Specific courses & eei
1 blueprint reading	EE1A,FF1
2 preparation of specifications	FF4
3 building materials	EE1B
4 hand & power tools	BB3A
5 foundations	EE1C&D
6 forms	EE1C
7 rough framing	EE1E, FF7
8 roof components	EE1F
9 interior & exterior finish	EE1H
10 stair construction	EE1I
Performance Test - 2.33 $10.25	
1 rafters	EE1E, FF7
2 window frame construction	EE1E, FF7
3 layout	FF4
4 tool & material identification	EE1B, FF2&4
5 use of transit	
6 blueprint reading	EE1A. FF1
7 stairway stringer	FF7
8 sole plate	
EE=Building Trades	
FF=Construction Carpentry	
BB=Introduction to Construction Careers	

Child Care Services	CHILD CARE WORKER
Written Test - 3 hrs - 175 items	Specific courses & eei
1 young child development	F1A
2 relationships with families	F2D
3 learning environment	F3A-D
4 advanced social/emotional development	F1B &C
5 intellectual competence	F1B
6 professionalism	2 & 5
7 guidance	F1C
8 program management	F4F
Performance test - 3 hours - $0.00	
1 development of learning activity	F4C
2 development of lesson plan	F4B&E
3 employment application	F4A
4 self-evaluation	
F=Child Care and Guidance, Management and Services	
Unlettered=general requirements for all courses in Home Economics	

Computer and Information Sciences	COMPUTER OPERATOR
Written Test -	Specific courses & eei
information technology uses	C4A-D
related math	G3A
computer programming language	G3B&D
applications software	E5
computer literacy	G1A, G3B
computer user skills	G2C
computer programming concepts	G3D
Performance Test - 4 hrs $2.00	
spreadsheet application	E3
word processing/text writer application	E1D
coding in BASIC, FORTRAN, or PASCAL	G3
database application	G1A, E4A
diskette backup	G4C
C=Business Information Processing	
G=Business Computer Programming I	
E=Business Computer Applications I	

Dental Assisting	DENTAL ASSISTANTS
Written Test - 3 hrs - 166 items	Specific courses & eei
1 dental materials	F8,11,12
2 laboratory skills	G1-9
3 chairside skills	F1
4 dental sciences/related skills	F13,2,3
5 dental radiology	F4
6 related theory & skills	
Performance tests - 1.75 hrs $2.00	
1 instruments	F8,11
2 radiographs	F4
3 handwashing	F11
4 autoclave	
5 insurance forms	F10
6 syringes	
F=Dental Assistant	
G=Dental Laboratory Aide	

Diesel Engine Mechanics - 5.5 hrs	DIESEL MECHANICS
Written Test - 3 hrs 179 items	Specific courses & eei
1 servicing diesel fuel system	CC40, HH6
2 rebuilding engines	HH4
3 shop equipment	
4 engine disassembly	HH4
5 maintaining & servicing cooling & lube systems	CC4D, HH6
6 servicing intake & exhaust systems	HH6
7 testing & servicing electrical system	HH7&8
8 maintenance testing & engine operation	HH1
10 maintaining & servicing cylinder heads	
11 servicing flywheel/clutch/transmission	cc3D
12 safety	24
Performance Test - 2.5 hrs $5.00	
1 battery testing	CC3D
2 clutch adjustment	
3 drilling	t1&5
4 tapping	T1&8
5 engine repair	HH4
CC=Introduction to Transportation Service Careers	
HH=Diesel Mechanics	
T=Machine Shop	
Unlettered=general requirements for all courses in Trade & Industry	

Drafting	DRAFTERS
Written Test - 3 hrs - 120 items	Specific courses & eei
1 interpretation of drawings	X3A, AA4
2 machine drawing	AA6,9
3 architectural drawing	AA6
4 mathematical calculations	AA5
5 electronic drawing	AA6
6 sheet metal drawing	AA6
7 mapping & cartography	AA11
8 computer-aided drawing	X3C, AA7
Performance Test - 3 hrs $0.00	
1 production/detail	AA1-13
2 specialty areas of:	
electrical, piping, architectural	AA6
3 orthographic projection	
4 auxiliary	AA5
5 threads	
X=Introduction to Graphic Communications Careers	
AA=Drafting	

Electrical Occupations	ELECTRICIAN'S HELPERS
Written Test - 3 hrs - 183 items	Specific courses & eei
1 motors & motor controls	L2A&C
2 National Electrical Code	H1C
3 materials	7D
4 tools	7D
5 blueprint reading & estimating	H1D
6 alternating current	O8
7 direct current	O2
8 safety	4
Performance test - 3 hrs $27.50	
1 drawings/diagrams	H1D
2 wiring	H1FG, 2A
3 use of tools	7E
4 component mounting	H1F
5 economy of time	2J
H=Electrical Trades	
L=Introduction to Electrical/Electronics Careers	
O=Industrial Electronics	
Unlettered=general requirements for all courses in Trade & Industrial	

Machine Trades - 175 items 8.5 hrs $12	MACHINISTS
Written Test - 3 hrs	Specific courses & eei
1 lathes	T7, U1A
2 milling	SA, T1, U1A
3 grinding	SA, T11
4 benchwork	U1H
5 drilling	SA, T1, U1A
6 sawing	
7 related theory	
8 advanced processes (CNC,EDM)	
Performance Test - 5.5 hrs	
1 lathe operations	T7, T8, U1F
2 drilling operations	T4
3 milling machine operations	U1A, U1E&G
4 measurement	SB, T2
5 safety	4
6 layout	T3
7 benchwork	U1H
S=Introduction to Precision Metal Manufacturing Careers	
T=Machine Shop	
U=Metal Trades	
Unlettered=general requirements for all courses in Trade & Industry	

Small Engine Repair	MAINTENANCE REPAIRER-SMALL ENGINE
Written Test - 176 items	Specific courses & eei
1 theory and shop arithmetic	7B
2 ignition	I5D&6D
3 compression and lubrication	I5D&yD, M5, S3
4 valves, ports, and exhaust	I5D
5 engine block components and cooling	I5D&6D, S1, M3
6 shop procedures and safety	4
7 governors	
8 starters	I5D, S3
9 powered equipment mechanisms	S1
Performance test - 3 hours - $6.45	
1 engine check	I6E, M4, S6
2 carburetor service	S3
3 valve service	S6
4 ignition system service	I6E, S3
5 parts inspection, measurement, testing	
6 invoicing parts	M2
7 use of tools and equipment	7D&E
8 use of time	2H,I,&J
M=Marine Engine Repair	
S=Small Engine Repair	
I=Introduction to Transportation Service Careers	
Unlettered=general requirements for all courses in Trade & Industry	

Medical Assisting - 168 items 5.67 hrs	MEDICAL ASSISTANTS
Written Test - 3 hrs	Specific courses & eei
1 clinical assisting	L3
2 laboratory procedures & equipment	K
3 medical terminology	B2C
4 anatomy & physiology	B1G
5 patient instruction	
6 radiology	N
7 diagnostic procedures & equipment	L8, K5
8 electrocardiography	I
9 medical ethics & law	B1C
Performance Test - 2.67 hrs	
1 laboratory procedures	K
2 diagnostic procedures	L8, K5
3 clinical procedures	L3
4 general office procedures	B2
B=Health Care Science	
I=Electrocardiograph Tech	
K=Medical Lab Aide	
N=Nursing Assistant, Radiology	
L=Medical Office Assistant	

Building Construction Occupations - 5.5 hrs	OTHER CONSTRUCTION HELPERS
Written Test - 3 hrs 172 items	Specific courses & eei
1 general building construction	B2D, E1
2 blueprint reading	B2A, E1A
3 electrical	B4, E3
4 painting & decorating	B5, E4
5 plumbing & heating	B6m E5, K1K
6 general safety	4
Performance Test - 3.5 $10.00	
1 plumbing	B6, E5
2 carpentry	B3, E1
3 electrical	B4, E3
4 masonry	B2E&F, E2
B=Introduction to Construction Careers	
E=Building Trades	
K=Piping Trades/Plumbing	
Unlettered=general requirements for all courses in Trade & Industry	

Home Health Aide - 138 items 5 hrs	OTHER HEALTH WORKER: HOME HEALTH AIDE
Written Test	Specific courses & eei
1 reporting	M11
2 recording	J7
3 abbreviations	
4 vocabulary	B2C, C2B
5 first aid	B1B, C1G, D1I
6 vital signs	B4C, C1H, D1J
7 nutrition	H6
8 elimination	
9 basic emergency measures	
10 patient care	J1-3
11 positioning	
12 employability skills	C2A
13 safety	B1B, C1C, D1C
Performance Test	
1 vital signs	B2C, C1H, D1J
2 infant care	DD2, E2
3 bed making	J6
4 first aid	B1B, C1G, D1i
5 patient transfer	J3
6 measurement of fluids	J7
M=Nursing Assistant	
B=Health Care Science	
C=Health Occupations Education I	
D=Health Occupations Education II	
E=Child Development	
H=Diet Clerk	
J=Home Health Aide	

General Secretarial	OTHER SECRETARIES
Written Test - 3 hrs - 175 items	Specific courses & eei
1 office procedures	
2 filing	I2, D1H
3 communication skills	I5, B4
4 keyboarding skills	B1B&C, J1
5 word processing	E1&2, J2
6 computational skills	E6
Performance test - 3 hrs $1.00	
1 transcription	C1D
2 document processing	C1C
3 prioritizing	
4 keyboarding	B1B&C, J1
6 filing	I2, D1H
B=Office Administration	
C=Business Information Processing	
D=Business Office Services	
E=Business Computer Applications I	
I=Office Support Systems	
J=Microcomputer Applications	

Plumbing - 6 hrs	PLUMBER'S HELPER
Written Test - 3 hrs 156 items	Specific courses & eei
1 assembly & layout	B6A-C
2 installation	B6A-C, E5
3 planning	K2B
4 inspecting	K2E
5 evaluating	K2E
6 maintenance & repair	B6A-C, K2B, K2E
Performance Test - 3 hrs $11.70	
1 drawings	K2A
2 layout	E5
3 rough installation	B6A-C, K2B
4 installation of fixture	E5, K2D
B=Introduction to Construction Careers	
E=Building Trades	
K=Piping Trades/Plumbing	

Production Agriculture	PRODUCTION CLERKS
Written Test - 3 hrs - 164 items	Specific courses & eei
1 farm management & record keeping	J1-11
2 animal science	Q1-9
3 plant science	R1-8
4 leadership & employability	1 & 2
5 agricultural mechanics	D1-11
Performance test - 2.5 hrs $5.15	
1 animal science	Q1-9
2 agricultural mechanics	D1-11
3 farm management	J1-3
4 recordkeeping	J8
5 plant science	R1-8
J=Agribusiness Management & Marketing	
Q=Animal Science	
R=Plant & Soil Science	
D=Introduction to Agricultural Mechanics	
Unlettered=general requirement for all courses in Agricultural Education	

Welding - 6.13 hrs	WELDERS & CUTTERS
Written Test - 3 hrs 151 items	Specific courses & eei
1 shielded metal arc welding	W2
2 oxyfuel welding	W1
3 welding terms & symbols	W5, U2H
4 safety	4
5 electricity	Y1A
6 basic metallurgy	
7 gas metal arc welding	W3
8 gas tungsten arc welding	W3
Performance Test - 3.13 hrs $5.50	
1 shielded metal arc welding	W2, U2F
2 oxyacetylene welding	
3 oxyfuel cutting	W1, U2B
4 gas metal arc welding	W3, U2F
5 gas tungsten arc welding	W3, U2F
W=Welding	
U=Metal Trades	
Y=Introduction to Electrical/Electronic Careers	
Unlettered=general requirements for all courses in Trade & Industry	

General Office	WORD PROCESSING TYPIST
Written Test - 3 hrs - 167 items	Specific courses & eei
1 business communications	I5
2 mail processing	I4
3 key boarding	I1
4 word processing	E3&6
5 filing & records management	I2
6 office procedures	I6
7 computational skills	I3
8 interpersonal & employability skills	I7
Performance test - 3 hrs $1.00	
1 filing & records management	
2 computational skills	I2A
3 tabulation	I3
4 business correspondence	I3
5 forms preparation	I5
6 envelope preparation	O4A
7 communication	I5
E=Business Computer Applications I	
I=Office Support Systems	

APPENDIX G:
Progress Reports

FIRST QUARTER REPORT

Performance Standards for Vocational and Applied Technology Education

Barbara E. Selke-Kern

Sponsored Cooperatively by
Texas Education Agency

and

The University of Texas at Austin
Extension Instruction and Materials Center
Division of Continuing Education

October 1, 1991

Project Number: 22420025
RFA Number: PD-2

Performance Standards for Vocational and Applied Technology Education

Period Covered: From July 1, 1991 to September 30, 1991

Major Activities and Accomplishments During This Period

1. Nine teleconferences were held with members of the Specific Advisory Groups.

2. It was determined that Richard Bouton—the designated project manager of the 1990-91 project, Research and Development of Performance Standards for Selected Vocational Education Programs, and the 1991-92 project, Performance Standards for Vocational and Applied Technology Education—was too ill to continue. A search for a new project manager was carried out and an individual for this role identified.

Significant Findings and Events

1. Richard Bouton conducted three interest sessions at the August Vocational Administrators and Supervisors Conference to provide a status report on the project, to obtain advice on the draft core performance standards, and to solicit volunteers for the feasility study to be conducted in the fall.

2. Richard Bouton planned and conducted nine teleconferences with members of the Specific Advisory Groups to obtain reactions to and recommendations on the draft core performance standards developed to date.

3. The status of the progress on the 1990-91 and 1991-92 performance standards projects was assessed. When it was determined that Richard Bouton could not continue with the performance standards project, all work done to date was collected and reviewed and, with the advice and consent of the Texas Education Agency's (TEA's) directors of Vocational Programs and Vocational Special Needs, an alternate plan of action was developed.

4. A search was conducted for a new project manager. A qualified individual with the qualifications and ability to carry forward with the project in a timely and quality fashion was identified.

Problems

1. Significant delays were created by Richard Bouton's illness and his resulting inability to complete the work he had begun in the 1990-91 project and to carry out the 1991-92 project.

2. The problems created by Mr. Bouton's departure were compounded by TEA's decision to move from June to January the timeline for delivery of the feasibility-tested core performance standards.

Data Collection

1. Recommendations on the draft core performance standards were solicited from the nine Specific Advisory Groups and from participants in the August Vocational Administrators and Supervisors Conference.

Progress on Evaluation Plans and Procedures

1. Evaluation plans and procedures were not addressed during this quarter.

Staff Employment and Development

1. With the advice and consent of the TEA's directors of Vocational Programs and Vocational Special Needs, Richard Bouton was dismissed as project manager and the search for a new project manager conducted.

2. The individual to be recommended as the new project manager was identified

Future Activities

1. Approval for the new project manager will be obtained from TEA's directors of Vocational Programs and Vocational Special Needs, and the new manager will be hired in the first weeks of the second quarter.

2. The project will continue in accordance with the agreed upon timelines and conditions.

SECOND QUARTER REPORT

Performance Standards for Vocational and Applied Technology Education

Cindy Roberts-Gray
Resource Network

Sponsored Cooperatively by
Texas Education Agency

and

The University of Texas at Austin
Extension Instruction and Materials Center
Division of Continuing Education

January, 1992

Project Number: 22420025
RFA Number: PD-2

The project reported herein was performed through a contract with the Texas Education Agency under the provisions of the Carl D. Perkins Vocational Education Act (Public Law 98-524). Contractees undertaking such projects are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinion stated do not, therefore, necessarily represent official Texas Education Agency position or policy.

Performance Standards for
Vocational and Applied Technology Education

Period Covered: From October 1 to December 31, 1991

Major Activities and Accomplishments During This Period

1. A meeting of the General Advisory Committee was conducted October 21, 1991. The committee approved a set of draft standards and a preliminary draft of a prototype data collection instrument.

2. Twelve school districts were recruited to participate in the feasibility assessment: 4 large districts (Brownsville, Cypress-Fairbanks, El Paso, and Garland), 3 medium size districts (Amarillo, Lamar Consolidated, and Weslaco), 4 small districts (Bellville, Big Spring, East Central, and Lufkin), and 1 district with fewer than 600 students (Hutto).

3. During November and December, site visits were made to all 12 of the school districts recruited to participate in the feasibility assessment.

4. The final report for project year 1991 was completed and submitted in December, 1991.

Significant Findings and Events

1. Information obtained during interviews with school district personnel and review of records in the 12 school districts that participated in the feasibility assessment indicated need for combining and revising several of the draft standards. School district personnel also requested substantial revision in the data collection instrument.

2. It appears that nearly all of the data elements that would be needed to measure performance relative to the standards are elements that districts already collect for entry into the PEIMS.

3. There is substantial concern within the districts about implementation issues. District personnel indicated need, for example, for more guidance from the TEA about definition of "a coherent sequence of courses" in vocational education programs and about programs or procedures that would be needed to pull the required data from the PEIMS.

Problems

1. The feasibility assessment was originally planned as a two-part study with background and baseline data to be collected in the winter of 1991 and a pilot implementation of the standards and measures to be conducted in the spring of 1992. Because of TEA's decision to move the timeline for delivery of the feasibility-tested core

performance standards from June to January, both phases of the assessment were collapsed into single site visits made in November and December 1991. The core standards, measures of performance, and data gathering instrument are based, therefore, on guidance received from background research, the expertise of the General Advisory Committee, and critique and suggestions of school district personnel.

2. The work plan for this project specifies that, in addition to the core performance standards, "course specific" standards will be developed as appropriate. Neither the project records nor information obtained during the feasibility assessment provided clear demand or guidelines for the development of course specific standards.

Data Collection

1. Recommendations on the draft core performance standards and the prototype data collection instrument were obtained from participants at the meeting of the General Advisory Committee in October, 1991.

2. Interviews, records reviews, and pilot implementation of the data collection instrument were conducted on-site in the sample of 12 school districts in order to assess the feasibility of the core standards, measures of performance, and data collection instrument.

Progress on Evaluation Plans and Procedures

The evaluation plan for this project calls for regular and frequent meetings with the TEA project director, the General Advisory Committee, and in-house evaluation to ensure progress in accord with project plans and timelines. During the period reported here, there was one meeting with the General Advisory Committee, two meetings with program specialists at UTEIMC, and three meetings with the project director, and one meeting with program directors at the TEA. Results of these meetings were used to make appropriate adjustments in project procedures.

Staff Employment and Development

Cindy Roberts-Gray, Ph.D., of the Resource Network of Austin, began work as project manager in October 1991. Her assistant on this project is Sandra Wells.

Future Activities

1. Results of the feasibility assessment will guide development of core standards, measures of performance, and data collection instrument that will be recommended to the TEA and presented at the mid-winter administrators conference in January.

2. The project will continue in accordance with the agreed upon timelines and conditions.

THIRD QUARTER REPORT

Performance Standards for Vocational and Applied Technology Education

Cindy Roberts-Gray
Resource Network

Sponsored Cooperatively by
Texas Education Agency

and

The University of Texas at Austin
Extension Instruction and Materials Center
Division of Continuing Education

April 30, 1992

Project Number: 224200425
RFA Number: PD-2

The project reported herein was performed through a contract with the Texas Education Agency under the provisions of the Carl D. Perkins Vocational Education Act (Public Law 98-524). Contractees undertaking such projects are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinion stated do not, therefore, necessarily represent official Texas Education Agency position or policy.

Performance Standards for Vocational and Applied Technology Education

Period Covered: From January 1, 1992, to March 31, 1992

Major Activities and Accomplishments

1. Data collected in the sample of the 12 school districts that participated in the feasibility study in November and December 1991 were analyzed and used as a guide in revising the draft of core standards, measures of performance, and data collection instrument for the evaluation system.

2. A working paper entitled, "Findings and Recommendations from the Feasibility Study," was prepared and submitted to the senior director and program directors for vocational and applied technology education at the Texas Education Agency on January 22, 1992. This report included the revised drafts of core standards, measures of performance, and data collection instrument. Subsequent to a January 27 meeting with the program directors and the director of vocational funding, monitoring and compliance, additional revisions were made to ensure that data are captured to measure program access and program success for targeted groups to achieve equity in vocational and applied technology education.

3. On January 30, 1992, at the Mid-Winter Vocational Supervisors, Administrators, and Counselors' Conference, presentations were made to describe progress of the project and receive input from conference participants to guide implementation planning for the evaluation system.

4. On January 31, 1992, a report entitled, "Performance Standards for Vocational and Applied Technology Education: Core Standards, Measures of Performance, and Data Gathering Instruments," was submitted to the project director and the senior director for vocational and applied technology education at TEA to distribute to members of the Committee of Practitioners for their consideration.

Significant Findings and Events

1. Project staff met with the senior director of vocational and applied technology education and the project director at TEA on February 10, 1992, to review the project work plan. At that meeting, it was determined that, given guidance to date from vocational programs directors at TEA and results of field visits in November and December 1991, it would be more appropriate to use the remaining months of the project to address issues related to implementing the core standards and measures of performance than to address the issue of course-specific standards.

   Following this decision, additional information regarding implementation issues was obtained in meetings on February 12, February 19, and March 20 with TEA staff who have special expertise regarding the state's Public Education Information Management System (PEIMS) and the Academic Excellence Indicator System (AEIS).

2. On February 27, 1992, the Committee of Practitioners approved, with several modifications, the eight core standards and measures of performance recommended in the report dated January 31, 1992.

3. In mid-March, 1992, it was learned that the Commissioner of Education judged that the initial proposed standards and measures did not adequately address quality expectations relating to such items as academic gains, following students from enrollment in a coherent sequence of vocational and applied technology education to completion, and the enrollment and progress of special populations students in high level or rigorous vocational programs. TEA staff selected only three of the eight proposed standards and measures to be presented to the State Board of Education for its consideration.

Problems

1. At the close of this third quarter of the project, it is not clear what direction should be taken in the remaining months to produce information and products that will be as useful as possible in implementing an evaluation system that will meet the requirements of the Perkins Act and adequately address quality expectations for vocational and applied technology programs.

Data Collection

1. Recommendations on the draft core performance standards and the prototype data collection instrument were obtained from directors of vocational and applied technology education programs at the TEA in January 1992; from participants at the Mid-Winter Vocational Supervisors, Administrators, and Counselors' Conference in January 1992; and from TEA staff familiar with PEIMS and the AEIS in February and March 1992.

Progress on Evaluation Plans and Procedures

1. The evaluation plan for this project calls for regular and frequent meetings with the TEA project director, the General Advisory Committee, and in-house evaluation to ensure progress in accord with project plans and time lines. During this quarter, there was one such meeting with vocational program directors and the director of vocational funding, monitoring, and compliance at TEA (January 27,1992); three meetings with the project director (January 27, February 10, and March 11, 1992); and three meetings with the senior director of vocational and applied technology education (February 10, March 11, and March 20). Results of these meetings were used to make appropriate adjustments in project procedures.

Staff Employment and Development

1. Cindy Roberts-Gray, Ph.D., of the Resource Network of Austin, began work as project manager in October 1991. Her assistant on this project is Sandra Wells.

Future Activities

1. Pending guidance from the project director and the senior director for vocational and applied technology education at TEA, information obtained during meetings with staff at the TEA regarding AEIS will guide further work on this project.

2. It is expected that the project will continue in accordance with objectives and time lines specified in the approved work plan for this project.