

# **SKILL STANDARDS: A PRIMER**

**Center for Workforce Development  
Institute for Educational Leadership**

**Joan L. Wills**

*The author accepts all responsibility for the accuracy of the contents of this paper and for all opinions herein expressed. There should be no presumption that these views are shared by anyone affiliated with the Departments of Labor and Education. Preparation of this report was sponsored by the American Youth Policy Forum.*





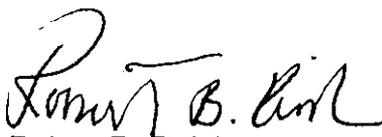
## A Message from The Secretaries of Labor and Education

A key part of the Goals 2000: Educate America Act -- Title V -- establishes the National Skill Standards Board (the Board). This Board will be responsible for creating a national system of voluntary skill standards to be available for use by employers, workers, unions, educators, and government. The structure of this Board follows a long American tradition of creating public and private sector partnerships to solve collective problems which are beyond the scope of either sector. Assuring that our nation has the strongest, technically competent workforce and facilitating its transition to high performance work organizations, represents such a joint challenge.

We are confident that over time, the National Skill Standards Board through this voluntary, industry-led system will contribute to the nation's prosperity by helping to: ensure the development of a high skill, high quality, high performance workforce from frontline workers to CEOs; enable industries to effectively communicate with training providers and prospective employees skill requirements for employment; provide employers with tools for evaluating the skill levels of job applicants and for training current employees; and provide labor organizations with tools to enhance employment security through the use of portable credentials and skills. For all levels of government, skill standards can be used to promote quality education and training programs to facilitate linkages with other national efforts aimed at enhancing workforce skills and to improve employment information. These include school-to-work transition projects, vocational technical education, job training programs and development of a comprehensive, common nomenclature for discussing skills and occupations.

It is our vision that through this system all students and workers will have access to clear information on the skills needed for employment and nationally recognized certifications and thereby enable them to pursue life long career advancement. We believe the establishment of common skill standards holds special promise for women, minorities and re-entrants into the workforce by offering objective statements of expected performance and by facilitating the portability of skills across employers, territorial borders and industries.

This primer provides a brief introduction to the issues facing the Board, the experiences of other nations and related areas. In addition, it highlights the challenges stakeholders must address if the vision of a national system is to become a reality.

  
Robert B. Reich  
Secretary of Labor

  
Richard W. Riley  
Secretary of Education



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## EXECUTIVE SUMMARY

Amid change in the workforce and economy, which has affected employer/employee workplace commitment, a need has arisen for current workers and those entering the workforce to prepare themselves for career change over the duration of their careers. Equally, employers are finding that a better understanding of their workplace skill requirements helps potential employees prepare for changes in those requirements. Skill standards are one important way to assist both employers and employees in preparing for these changes.

Standards help ensure quality, indicate goals, and promote change (Sivan, 1993). In education, standards help decide who is admitted, who graduates, who is accredited. In the world of work, standards help decide who is permitted to sell a house, connect a power line, or perform surgery. Standards facilitate: 1) communication, 2) protection, 3) harmonization, 4) simplification and 5) valuation. Within the education and training enterprise, standards have been used almost solely for valuation and have not taken advantage of other purposes of standards, such as promoting communications (Sivan, 1993). The communication value of standards is of special note because employers need to "signal" to schools, students and current workers what jobs in their organizations require.

As with most standard-setting efforts, the skill standards have to be negotiated among the various stakeholders. Many leading nations have formal processes for engaging employers in standard-setting -- processes that have not been present in the U.S. In the United States we lack both the common language and the common processes necessary for stakeholders to arrive at descriptions of what workers need to know and be able to do.

Against a backdrop of concern about the vocational preparation of the non-college bound and the academic preparation of students generally, national level activities around education reform and standards have increased markedly in recent years. Federal activities on skill standards are one piece of these standards/reform activities. The National Advisory Commission on Work-Based Learning did the spade work for a national system to promote the voluntary use of skill standards. Hearings were held throughout the country to assess interest in the idea and the Commission developed specifications for creating cooperative agreements with a range of industry-based associations. The Departments of Labor and Education committed to fund a limited number of projects, eventually 22 in all. These knowledge-development projects are still underway and some will continue through 1996.

## Studying Standards

In tandem with establishing the 22 demonstration projects, the federal government through the Department of Education, took the lead in funding a baseline study of how skill standards are developed and used in the United States. The study, conducted by the Institute for Educational Leadership (IEL), found a great deal of effort underway and serious gaps in current practice.

Skill standards have been extensively used in this country since before the turn of the century and cover a wide range of occupations. Occupations in the medical, legal, social work, and real estate areas are but a few of the occupational areas that have established collective, but self-imposed, criteria for recognizing workers as capable of practicing their chosen crafts.

In the U.S. most occupational credentials are awarded by non-public organizations. Even in this country, however, government has become more involved in oversight of many occupations through state and federal licensure requirements, resulting in a complex web of relationships between licensing and voluntary credentialing systems.

Two distinct communities of interest -- education and industry-- have created and sustained skill standards activities.

The IEL study found that approximately 700 committees using industry volunteers exist across the country and assist state educators in developing skill standards. Despite these extensive efforts, no one set of skill standards has been established for all states or is used by every state. Only 26 to 32 states use a common set of standards for any one occupation.

On the industry side, approximately 400 professional societies and industry-based associations are involved in the promotion and issuance of some form of skills-based credential. Approximately 150 of these organizations focus on occupations that do not require attainment of at least a bachelor's degree in order to earn the credential. Credentialing activities can include: prescribing education and experience qualifications for certification candidates; establishing for potential accredited institutions qualifications for curriculum, faculty, and facilities; administering competitive exams; and conducting assessment visits.

The IEL study identified common patterns in the certification systems. Among these are:

- No programs offered a career path from novice through masters' level in broad occupational areas;
- In almost all programs, eligibility is linked to time in a job/industry;
- Education is credited against time spent in the workplace to qualify for assessment;
- The great majority of programs assess through paper-and-pencil tests;
- Most programs have some form of required re-certification; and

- Most programs have developed a core body of knowledge that a candidate must have in order to minimally qualify for consideration.

## **The National Skill Standards Board**

Goals 2000: Educate America Act, signed by President Clinton in March 1994, includes Title V, The National Skill Standards Act of 1994. A major element of the act is the creation of the National Skill Standards Board (NSSB). The Board's mission is ambitious. The Board is to serve as a catalyst for the development of a voluntary system of skill standards in such a fashion that virtually all institutions concerned with worker skills would eventually be affected. The legislative vision is that skill standards should be used by:

- the nation for the development of a high skills, high quality, workforce;
- industries and individual employers to inform training and requisite skill needs;
- labor organizations to enhance employment security through portable credentials and skills;
- workers to obtain certifications of skills, pursue career advancement, and enhance their abilities to reenter the workforce;
- students and entry-level workers to determine needed skill levels;
- training providers and educators to ascertain appropriate training services; and
- government to evaluate publicly-funded training; facilitate transition to high performance work organizations; increase opportunities for minorities and women in the workforce; and facilitate linkages with other national efforts aimed at enhancing workforce skills, such as school-to-work transitions, vocational technical education, and job training programs.

Each of these objectives, standing alone, represents an enormous challenge. Collectively, they demand both the good will of everyone involved and the willingness of "competitors" to collaborate in new and different ways.

The National Skill Standards Act calls for the NSSB to have the following members: (a) four ex officio (the Secretaries of Labor, Education, and Commerce and the chairperson of the National Education Standards and Improvement Council, or NESIC<sup>1</sup>); (b) eight business persons nominated by business and trade associations; (c) eight organized labor persons nominated by recognized national labor federations; (d) two human resource professionals to be "neutral agents"; and (e) six persons, to be chosen from the following groups: educational institutions (including vocational technical institutions), community-

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<sup>1</sup>. As of the publication of this document, the NESIC provision is under consideration for repeal by Congress.

based organizations, state and local government, and non-governmental civil rights organizations.

## **Key Tasks of The National Skill Standards Board**

The NSSB has several assignments to undertake. It is to:

### **Identify Broad Occupational Clusters.**

One of the first activities of the NSSB is to establish the broad occupational clusters that share characteristics that are appropriate for the development of skill standards. The statute calls for wide consultation with all stakeholders prior to establishment of these clusters. The NSSB will have to maintain an industry-driven perspective -- a difficult task, considering the fact that most large firms cut across multiple industry groupings and hire from several different occupational groupings.

### **Recognize Partnership Bodies.**

The actual standards are to be developed through voluntary partnerships. These bodies must be "full and balanced" and composed of: a) representatives of business; b) representatives of organized labor employees; and, c) representatives of educational institutions, community-based organizations, state and local agencies with administrative control over education and/or training institutions, other policy development organizations with expertise in workforce skill requirements, civil rights groups, and individuals with expertise in testing and measurement.

A key lesson emerging from the 22 demonstration projects is that creating and maintaining a viable coalition, often among disparate groups unaccustomed to coalition building, is a time-consuming and difficult process.

### **Establish Objective Criteria.**

The NSSB is to establish objective criteria for providing credentials that are awarded based upon formal assessments. These are to be used by institutions of higher education, labor organizations, trade associations, employers providing formalized training; and by School-to-Work Opportunities Systems.

The NSSB has several quality assurance functions, to be established through a variety of endorsements. The endorsements must take into account:

- international standards;
- requirements of high performance work organizations;
- apprenticeship standards; and

- content and performance standards certified by the National Educational Standards and Improvement Council.

Once endorsement criteria have been established, they are used to ensure that standards will be: (a) compatible with existing federal civil rights laws; (b) updated regularly; and, (c) portable across industries and occupations (when appropriate), geographic areas, and institutions of education and training.

A task of the NSSB will be to develop an infrastructure to support its total effort. This task will be accomplished through:

- conducting research;
- identifying and maintaining a catalog of skill standards (domestic and international);
- acting as a clearinghouse and facilitator;
- developing common nomenclature relating to skill standards;
- encouraging development and adoption of curricula and training materials;
- providing technical assistance to partnerships; and
- promoting the development of a coherent system.

The pilot projects and the lessons from other countries teach us that it takes time to create a skill standards framework, products and services.

Ultimately, the work of the Board and the voluntary partnerships must become part of the on-going business in all of our institutions concerned with the issues of workforce preparation and the workplace itself. Only then can the promise of skill standards be realized.



## SKILL STANDARDS: A PRIMER

### INTRODUCTION

Skill standards have been used by individual firms and industry for a long number of years for a variety of purposes including the selection and promotion of individual employees. Professions have used skill standards as a way to define the common core of knowledge required to call one's self a doctor or lawyer. Today these concepts are moving into a broader arena. After many years of effort on the part of those working to reform education and improve the preparation of students for work, there has developed a conviction that one important means of achieving both these goals is the creation of standards for the knowledge and skills required to work. The National Skill Standards Board (NSSB) is an essential part of this creation.

Current attempts to establish standards for occupations (or groups of occupations) are at once very new and part of an old and continuing effort to achieve the efficiency, clarity, and uniformity that standards provide. Standards are ubiquitous. When you shop for shoes or clothing and tell the clerk a "size," that size is a standard. When you stop at a red light and go when the light turns green you are responding to a standard. Standards help ensure quality, indicate goals, and promote change (Sivan, 1993).

In education, standards help decide who is admitted, who graduates, who is accredited. Standards in the world of work help decide who is permitted to sell a house, connect a power line, or perform surgery.

#### Why Standards?

The development of various types of standards has been selected as one of the key tools in the pursuit of the education goals, in part because standards facilitate:

1) communication, 2) protection, 3) harmonization, 4) simplification, and 5) valuation. (Sivan, 1993).

Within the domains of business and technology, standards are at the core of how transactions occur. However, Sivan observes that within the education and training enterprise, standards have been used almost solely for valuation, not benefitting from the other uses of standards, such as promoting communications.

In order to use standards most effectively, it is necessary to first reach agreement on the core ingredients of a skill standard. In many prior federal and, to some extent, state efforts to enunciate expected outcomes of education and training programs, there is a lack of any broadly recognized, commonly understood, and agreed-upon articulation of the

knowledge, skills, and abilities required to succeed in the workplace. This explains in part why efforts to establish performance standards in such programs as the Job Training Partnership Act (JTPA) have not proven totally satisfactory and why many current vocational preparation programs are judged inadequate. The NSSB is to focus its attention on this missing ingredient.

## CHANGING EDUCATION, CHANGING TRAINING

Most readers will have some general knowledge of the calls for reforming the public education system over the past decade. A variety of research reports and commission documents prepared by states and the federal government or generated by ad hoc groups of luminaries contributed to a clarion call for improving education during the 1980s. Most of these reports centered attention on upgrading the academic quality of the education enterprise.

For example, *A Nation at Risk*, issued by the U.S. Department of Education in 1983, set the broad agenda for upgrading academic levels. Shortly after the release of that report, an ad hoc Commission was called together by vocational education leaders and a report -- *The Unfinished Agenda: The Role of Vocational Education in High School* -- was issued by the National Center for Research in Vocational Education in 1984. A key reason for its issuance was a strong feeling on the part of the vocational education community that *A Nation at Risk* was elitist in its thrust and undervalued the important role high schools play in preparing young people for work.

The authors of *The Unfinished Agenda* were disappointed by the response of the federal and state policy-making bodies to their report. This lack of response was due in part to the image of vocational education as the dumping ground for less-than-talented students. It would take several pushes and pulls from other quarters before there would be an acknowledgement that any reform of the education system would have to consider preparation for work at both the secondary and postsecondary levels of education.

*The Neglected Majority*, a book by Dale Parnell, and the two reports, *The Forgotten Half: Non-College Youth in America* and *The Forgotten Half: Pathways to Success for America's Youth and Young Families*, by the William T. Grant Foundation Commission on Work, Family and Citizenship, are influential works that noted the importance of paying attention to the workforce-preparation responsibilities of the education enterprise. A key message from these reports (which were actively marketed to both federal executive and legislative leaders in the mid-1980s) was that we as a nation need to substantially rethink how we allocate vocational preparation resources, prepare curricula and deliver instruction, and provide individuals with tools for the workplace of tomorrow. The inclusion of Technical Preparation ("Tech Prep") as Title II of the Perkins Act -- the core federal vocational preparation legislation -- was a result of Dr. Parnell's work. *The Forgotten Half* helped to spawn a range of demonstrations and experiments such as Youth Fair Chance, National and Community Service and school-to-career projects that will be discussed in more depth later.

Other reports emerging from the Department of Labor (DOL) about the same time, such as *Workforce 2000*, *Apprenticeship 2000*, the Commission on Workforce Quality and Labor Market Efficiency report, *Investing in People*, and the DOL-supported study from the American Society of Training and Development, *Workplace Basics*, were beginning to send out the same message regarding training programs: the old ways of providing both private and government-supported training for workers and, specifically, for the at-risk populations (e.g., economically disadvantaged youth and adults, dislocated workers, and re-entrants into the workplace), needed to be upgraded and have a stronger "education focus" than most previous training programs. From these efforts came support for a range of research and demonstration efforts focused on improving the linkage between school and work.

### Models for Change

A convergence of opinion regarding the need to improve the linkages between education and training communities was fueled by an ever-increasing number of individuals who represented states, businesses, organized labor and community organizations, and who made pilgrimages to Europe and other parts of the globe to assess the strengths and weaknesses of other countries' education and training systems. Many of these people were supported in large measure by the German Marshall Fund. A consistent lesson from these visits was the recognition that in almost all of the countries visited, there existed a range of formal processes for engaging the employer community in the articulation of what students and workers need to know and be able to do. This communication between business and educators is the foundation for articulating skill standards.

### Skill Standards Emerge

In its 1990 report *America's Choice: high skills or low wages!* the Commission on the Skills of the American Workforce believed it was essential for the United States to establish formal processes, systems and structures that involved industries in the development and provision of education and training for large portions of the workforce. Through the efforts of Commission chair Ira Magaziner and co-chairs former Secretaries of Labor Dr. Ray Marshall and Senator Bill Brock, and through the staff of the National Center on Education and Economy (NCEE), implementation of the report's key recommendations is being zealously pursued.

Senator Brock, for example, agreed to become chair of the Secretary's Commission on Achieving Necessary Skills (SCANS) as part of the follow-up to *America's Choice*. Mr. Magaziner became a key member of the National Advisory Commission on Work-Based Learning (NACWBL), in many ways the precursor to the NSSB. That Commission did the ground work for a national system to promote the voluntary use of skill standards.

Hearings were held throughout the country to assess interest in the idea and the Commission developed specifications for creating co-operative agreements with a range of industry-based associations. A commitment was made by both the Departments of Labor and

Education to fund a limited number of projects, eventually 22 in all. As of the Spring 1995, these knowledge-development projects are still underway and some will continue through 1996. *Occupational Skill Standards Projects*, a document that describes the individual projects (including the occupations for which standards are being developed), was jointly published by the two departments and can be obtained from the Office of Vocational and Adult Education of the U.S. Department of Education.

At the same time the Bush Administration was pursuing the development of a skill standards system, the staff of the NCEE gained the approval of key members of Congress to promulgate the concepts embedded in the *America's Choice* report. As is often the case, a piece of legislation -- The High Skills, Competitive Work Force Act of 1991 -- was developed as a "floater" in order to test the waters and hold hearings. Senators Kennedy and Hatfield and Representatives Gephardt and Regula became the sponsors of this legislation, which included the requirement that a National Board for Professional and Technical Standards be developed to oversee standards development. The legislation would have allocated \$15 million to the Board for this purpose. (The \$15 million figure is also the amount authorized for use by the NSSB in the 1994 Goals 2000: Educate America Act, to be discussed later.)

The move toward development of standards was hastened by increasing calls for more accountability in education and training. At the federal level, the call for performance standards had gained currency in the prior decade. JTPA was the first federal legislation to require performance standards; since that time, other pieces of federal legislation, such as the Job Opportunities and Basic Skills Program (JOBS), targeted to provide assistance to welfare recipients, and the Carl D. Perkins Vocational and Applied Technology Education Act (commonly referred to as Perkins II) have followed suit.

The accountability movement at the state level, fueled by concerns from state legislators and governors about the ever-escalating allocations of state fiscal resources to education, caught hold in the late 1970s and rapidly expanded in the 1980s. The National Governors' Association (NGA) played a major role in constructing a framework for the movement. For example, Lamar Alexander, then Governor of Tennessee and Chairman of the NGA, in collaboration with Bill Clinton, then Governor of Arkansas, his successor as chairman of the Association, generated *Time for Results* in 1986. This publication and the Association's five-year commitment to track each state's activities in promoting education reform are widely viewed as precursors to the establishment of the National Education Goals in 1990.

Title V of the Goals 2000: Educate America Act, signed by President Clinton in March 1994, established the NSSB. Its mission is ambitious. The members of the Board are to catalyze a national system of voluntary skill standards in such a fashion that virtually all institutions concerned with worker skills would eventually be affected. The legislative vision is that skill standards should be used:

- by the nation for ensuring the development of a high skills, high quality, high performance workforce, including frontline workers;
- by industries to inform training providers and prospective employees of needed skills;
- by employers to evaluate the skill levels of prospective employees and assist with the training of current employees;
- by labor organizations to enhance employment security through portable credentials and skills;
- by workers to obtain certifications of skills, pursue career advancement, and enhance their abilities to reenter the workforce;
- by students and entry-level workers to determine needed skill levels and competencies for the workforce;
- by training providers and educators to ascertain appropriate training services;
- by government to evaluate publicly-funded training; facilitate transition to high performance work organizations; increase opportunities for minorities and women in the workforce; and facilitate linkages with other national efforts aimed at enhancing workforce skills, such as school-to-work transitions, vocational technical education, and job training programs.

Each of these objectives, standing alone, represents an enormous challenge. Collectively, they demand both the good will of everyone involved and the willingness of "competitors" to collaborate in new and different ways. The considerable patience and volunteer time of countless people will be essential, as nothing will be accomplished in a short time. Clearly, new paradigms will be required for the aforementioned purposes to be achieved on any substantial scale in the United States.

The NSSB is to be composed of 28 members, including:

- Eight business persons nominated by business and trade associations;
- Eight organized labor persons nominated by recognized national labor federations;
- Two human resource professionals to be "neutral agents";

- Six persons, with at least one from each of the following groups: educational institutions (including vocational education), community-based organizations, state and local government, and non-governmental civil rights organizations; and
- Four ex officio, non-voting (the Secretaries of Labor, Education, and Commerce and the Chairperson of the National Education Standards and Improvement Council, or NESIC).

The selection of NSSB members is to be made in the following fashion: 12 by the President, 6 by the Speaker of the House based on recommendations by both Majority and Minority Leaders and 6 by the President pro tempore of the Senate based on recommendations by both Majority and Minority Leaders.

The actual standards are to be developed through an as-yet-undetermined number of voluntary partnerships for each occupational cluster. These partnerships must be "full and balanced" and composed of:

- Representatives of business (small and large) to be nominated by national business or trade associations;
- Representatives of trade associations involved with the 22 grantees currently developing standards, where appropriate;
- Representatives of employees recognized by national labor organizations; and
- Representatives of educational institutions, community-based organizations, state and local agencies with administrative control over education and/or training institutions, other policy development organizations with expertise in workforce skill requirements, civil rights groups, and individuals with expertise in testing and measurement.

The NSSB is to recognize partnerships which voluntarily come together and meet the membership and endorsement criteria put forth by the NSSB. For some, not necessarily all partnerships, there is a possibility of receiving funding to support the skill standards development. The NSSB is to review grant applications from potential partnership bodies and may recommend to the Department of Labor (which is to act as the administrative agent for the Board) that such bodies be funded. Responsibilities and tools will be discussed later in this paper.

### **The Building Blocks**

Where did the idea come from that we needed such a structure and why was it embedded in an "education reform" piece of legislation?

The federal Department of Education had been given legislative authority in the Perkins II Act in 1990 to explore the development of occupational skill standards. Additionally, the writings of Secretary of Labor Robert Reich and others have generated growing acceptance that improving the knowledge and skills of the American workforce is an essential factor in the nation's capacity to remain economically strong.

### **The National Education Goals**

A careful study of the National Education Goals reveals that occupation-specific standards were not included as part of the goals-driven process. However, Goal 6, the Adult Literacy and Lifelong Learning Goal, provided the framework for the Employment and Training Administration of the Department of Labor to "push the edges of the envelope" regarding the idea of skill standards.

That goal specifically states "by the year 2000, every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and will exercise the rights and responsibilities of citizenship" (National Education Goals Panel, 1990). Two of the objectives under that goal provide only the most general reference to the development of a national system of voluntary skill standards. These objectives are:

- Every major American business will be involved in strengthening the connection between education and work; and,
- All workers will have the opportunity to acquire the knowledge and skills, from basic to highly technical, needed to adapt to emerging new technologies, work methods, and markets through public and private educational, vocational, technical, workplace, or other programs.

While the need for occupational skill standards may not have been envisioned as the goals were being drafted, the value of the goals is evident in the fact that they have fostered new *strategies* by which the nation can reach them. Skill standards are now envisioned as a key component of these strategies.

The promotion of skill standards was not the first Goal 6 undertaking of the National Education Goals Panel. One of the first tasks was to establish a factual base regarding the literacy levels of adult Americans, and to this end the federal government launched a major new measurement effort, the National Adult Literacy Survey (NALS). The early results of this effort have already proven a powerful tool for measuring progress and reminding us all of the daunting nature of the National Education Goals. Among the key preliminary findings:

- Twenty-one to 23 percent of the workers in this country demonstrated skills in the lowest level of prose, document and quantitative proficiencies, Level 1.
- Some 25-28 percent represented skills in the next higher level of proficiency,

Level 2.

- Nearly one-third -- about 61 million -- demonstrated performance at Level 3.
- Only 18-21 percent -- representing 34 to 40 million adults -- performed in the two highest levels, 4 and 5.

Thus, NALS suggests that as much as 50% of the workforce has very limited literacy skills that place severe restrictions on full participation in our increasingly complex society and increasingly high-skilled workforce.

### THE CURRENT FOUNDATION

As we have seen, there is a sound base upon which to build a skill standards system. The challenge is to construct a "central nervous system" that will connect the current scattered pieces together and fill in the missing links.

Perkins II provided the federal Department of Education with the authority to explore the expansion of industry-recognized skill standards. This legislative language was included due to the efforts of national trade associations such as the Automotive Service Excellence (ASE) and Associated General Contractors, which have been working voluntarily for a number of years with state vocational education leaders to improve school occupational education and training efforts. Those efforts, while positive, have been limited, and state educators have had to reach out to local employers to establish relevant curriculum and measures to assess the competencies students acquired while in school. As a case in point, the ASE certification of individuals and a program accreditation sponsored by the automotive service industry is the only standards effort recognized by all fifty states. This was due in large measure to the automotive service industry's using the ASE's certification as a hiring condition for workers. Today, a wide array of efforts are underway in every state to involve industry representatives in constructing workplace skill requirements.

Second, efforts to improve the quality of federally-sponsored training programs -- ranging from the classic work-based apprenticeship programs to the second-chance training programs -- led the U.S. Department of Labor to determine that without industry-driven skill standards, it would never be possible to measure the effectiveness of programs and judge the value of public and private investments in training.

The federal government, through the Department of Education, took the lead in funding a baseline study of how skill standards are developed and used in the United States. The study was conducted by the Institute for Educational Leadership (IEL) in concert with the Center for Policy Research of the National Governors' Association, the Meridian Corporation, and the National Vocational Technical Education Foundation. The result of this 1993 study was a four-volume report that provided an overview of skill standards systems in education and industry in the United States and six other countries. While it found a great deal of effort underway in many

quarters, it also found serious gaps in current practice in this country -- gaps that will need to be addressed by the NSSB.

The 22 previously mentioned developmental grants will become part of a far-flung U.S. skill standards effort that has been largely independent of government and -- even when supported by government funds -- voluntary in nature.

Skill standards have been extensively used in this country since before the turn of the century. The primary promulgators of work-linked, knowledge-based standards come from crafts where technical know-how represents the recognized "property rights" of the individual. Voluntarily established professional societies or craft guilds have the longest tradition of offering credentials for practitioners who most often work as independent agents. The occupational range is wide: medical, legal, and social workers, real estate brokers, electricians, and plumbers are but a few examples of occupations that have established collective, but self-imposed, criteria for recognizing workers as capable of practicing their chosen crafts.

Self-regulation of credentialing through non-public organizations is very much an American strategy. By far the most typical pattern in other industrialized countries is for government to perform the credentialing functions, either by awarding certificates to individuals or accrediting institutions. Certification can be in the form of a diploma for having completed a course of study or of an assessment of knowledge and skills by a neutral third party. Accreditation of institutions is done through some form of external review.

Even in this country, however, government has become more involved in oversight of many occupations through licensure requirements, resulting in a complex web of relationships between licensing and voluntary credentialing systems. Licensure has a distinctive role. It is a formal recognition by a unit of government allowing an individual to earn a living in a given occupation. Often associations representing particular occupations become aggressively involved in licensure to help control entry into the occupation or to assist members with potential health and safety liability legal claims.

Development of skill standards and certification comes from two distinct communities of interest -- education and industry.

### **Education-Driven Skill Standards Systems**

Vocational-technical education's primary approach has been to use task lists (i.e. the specific duties of a common set of jobs found in most enterprises) to establish the skill requirements needed for entry-level or intermediate jobs. These lists then become the basis for developing curricular, instructional, and evaluation criteria to ensure that students acquire the skills they need for specific jobs.

The IEL study found that approximately 700 committees, using industry volunteers, exist across the country and assist states in developing skill standards. These committees were

authorized by Perkins II, which required each state to establish at least two. Their explosive growth demonstrates the responsiveness of education policy-makers to industry needs.

The IEL study also found that a substantial portion of the education-driven skill standards are developed as part of consortia, such as the Vocational Technical Education Consortium of the States, with member states regularly adding to the pool of standards and task lists. However, no one set of skill standards has been established for all states or is used by every state. Only 26 to 32 states use a common set of standards for any one occupation.

Links are emerging between the occupational skill requirements identified through a job analysis process for individuals and the program performance standards for vocational-technical education programs established under Perkins II. Thus far, 33 states use such content standards as one of the core components of program performance standards.

It would be necessary to understand how each state uses differences in terminology and in structural relationships between themselves and their local school districts to fully appreciate the differences between, for example, curriculum development and guidelines for programs or courses; however, it is clear that skill standards are used in a variety of ways by the states, including:

- Curriculum development -- 48 states;
- Guidelines for programs or courses -- 46 states;
- Development of course syllabi -- 44 states;
- Assessing student mastery -- 29 states;
- Articulation between secondary and postsecondary programs -- 47 states;
- Program certificates of mastery (e.g. awarding of a special credential after completing course work and passing tests) -- 36 states;
- Testing and assessing skills acquired -- 42 states.

### **Industry-Driven Skill Standards Programs**

According to the IEL study, approximately 400 professional societies and industry-based associations are involved in the promotion and issuance of some form of skills-based credential. Approximately 150 of these organizations focus on occupations that do not require attainment of at least a bachelor's degree in order to earn the credential. Credentialing activities can include: prescribing education and experience qualifications for certification candidates; establishing for potential accredited institutions qualifications for curriculum, faculty, and facilities; administering competitive exams; and conducting assessment visits.

For many industry groups, these activities are self-regulating and privately driven. Self-regulation can prevent costly and cumbersome government regulation, and the privately driven approach requires service providers to stay close to marketplace changes.

The largest number of certification programs are directly related to occupations and industries where there has been either intervention by government to regulate the industry or the threat of regulation. Health care and real estate are examples of the first type and direct selling is an example of the latter type. Most certification programs reflect specialties or market niches.

In very few instances was there a single industry association that represented the total industry, offering the only certification services used by all of that industry. This is not surprising, since most industry associations are themselves specialty organizations.

The IEL study identified eight common patterns in the certification systems:

- Limited Recognition. No programs were found that offered a clear career path from novice through masters' level in broad occupational areas. Most programs offer only one, two, or three recognitions. For example, there are individual systems that provide certifications for each of the following: food-service manager, residential building manager, and retirement-housing manager; and there is a system for dental technicians that offers three specialty areas.
- Time Links. In almost all certification programs, a person must have worked in a job for a specified period of time in order to be eligible to become a candidate for exams.
- Credit for School. Most programs allow candidates to use school credit in lieu of more time spent in the workplace to qualify for assessment. This reflects the "jump start" opportunity provided by education versus the catch-as-catch-can approach to learning through less formal means. However, courts have ruled that an individual cannot be excluded from seeking recognition by a credentialing body if she or he does not have the "preferred" course work.
- Written Tests. The great majority of programs assess knowledge, skills, and abilities through paper-and-pencil tests that include essay questions as well as true-or-false questions. Many programs include some form of interview with a panel of peers, and the use of work-product portfolios is common.
- Continuing Education. Most programs have some form of required re-certification based on continuing education and professional development activities, typically through trade associations or postsecondary education institutions. Several organizations are developing tougher standards by requiring an individual to participate in formal re-certification assessment processes.

- "Grandfathering." Most programs permit a limited time period for "grandfathering" members of the profession by certifying them without requiring them to sit for exams, particularly where they have already established themselves within the professional arena and wish to continue their careers uninterrupted.
- Core Knowledge. Most programs have developed a core body of knowledge that a candidate must have in order to minimally qualify for consideration, and that can be used in materials to prepare candidates for certification. The material is shared (indeed promoted) among education enterprises and, if an association is also active in supporting institutional accreditation programs, the material is used to define the content of a program of study accepted by the accrediting organization.
- Organization Links. Some programs have established linkages with recognized organizations such as the American Council on Education (ACE) in order to ensure that a passing grade on an exam counts for college credit. ACE, as the nation's postsecondary self-regulating umbrella organization, has a lead role in establishing credentialing standards for education institutions. (IEL, 1993, Vol. IV)

Additionally, there are major industry sectors that do not have a tradition of promoting industry-wide skill standards, such as agriculture, mining, retailing and large portions of manufacturing. Manufacturing firms are often involved in firm-specific apprenticeship training programs for which courses of study and certification may or may not reflect cross-industry standards (IEL, 1993, Vol. I).

### **Lessons from Other Countries**

The Goals 2000 legislation recognizes the NSSB must coordinate the development of skill standards with the development of content and performance standards for core academic areas such as mathematics, science, English, foreign language, and geography. The NSSB is to benchmark proposed American standards against other countries' standards in order to promote world class competitiveness of students and members of the work force.

This requirement is an acknowledgement that lessons from other countries can help guide the work in this country. The IEL study reviewed skill standards systems in six countries: Australia, Canada, Denmark, Germany, Japan, and the United Kingdom. Each of these countries has developed systems to meet its own purposes. These systems tend to break into three categories:

- The "initial preparation" model represented by Germany and Denmark focuses on the school-to-work transition for young people. The Ministries of Education, in concert with well-defined industry-based organizations articulate the goals, curricula and forms of instruction for substantial portions of the students attending compulsory school in these countries.

- The "craft certification" approach represented by Japan and Canada meets the needs of more mobile adult workers, such as construction workers.
- The "comprehensive" model found in the United Kingdom and Australia is the youngest category, and is still emerging.

The goal is to provide clarity about academic and occupation-related standards for students still attending secondary and postsecondary schools, and to point the way to career progression after a person is in the workforce. This has necessitated the development of commonly recognized knowledge and of skill levels that are broadly recognized by employers as well as education and training providers (IEL, 1993).

The current plans for the establishment of voluntary academic and occupational skill standards in the U.S. clearly fall into the third model, the comprehensive approach.

### Australian Approach

Graham Slee, the head of the voluntary National Training Board (NTB) of Australia, visited the United States in 1991 and gave several speeches and seminars on the topic of developing a skills standards system. Consistently, he said that the single most important lesson to be learned from that Board's work is the importance of developing common language and the attendant common levels of recognized knowledge and skills. One of the key reasons for Chairman Slee's strong counsel regarding the development of a common framework and nomenclature is that skill standards should be viewed as the ties that bind the various stakeholders together. Such ties allow individuals to receive recognition for what they have learned through multiple sources and over time.

The IEL study found that the Australians rely upon industry standards groups to identify standards. These groups are charged with thinking about two types of standards across a number of different levels -- occupational core standards and industrial core standards.

Occupational core standards include broad-based competencies that must be achieved by all persons in an occupation regardless of their particular jobs. These competencies include abilities in numeracy, literacy, occupational health and safety, and communication within the occupational context. In addition, these competencies may include some broad technical competencies necessary to the occupation.

Industrial core standards are technical and broad-based, and must be mastered in order for a person to work effectively in a particular industry or industrial sector. Often these standards include the specific knowledge and skills someone must master for work in specialized areas, and thus they may have less transferability than do the broad occupational core standards or the basic industry core standards.

In addition to the NTB, there is a national collaborative organization charged with translating the standards into curricula and instructional materials for use within the education and training institutions. This organization is composed of representatives of the country's states and of various levels of the education system.

The NTB has established eight competency levels that serve as reference points for the development and recognition of competency standards. Examples of competency definitions for select levels are as follows:

- Level 2. Competencies mean that a person has an established work orientation and the knowledge, skills, and demonstrated capacity to perform proceduralized tasks under general supervision, and more complex tasks involving the use of theoretical knowledge and motor skills under close supervision. Preparation for Level 2 employment is generally obtained through job-specific or general training that may be certified by appropriate authorities. Level 2 training typically includes an apprentice worker within many industries.
- Level 4. Competencies mean that a person has highly developed skills, knowledge, or capacity for self-directed application, including the use of appropriate techniques and equipment required to perform highly complex tasks involving substantial applied theoretical knowledge and motor skills. Many of the complex tasks would be performed without supervision, and might include supervising the work of others. This category includes advanced skilled, autonomous workers; training for it would lead to an initial, post-trade, or equivalency certificate or to an advanced certificate.
- Level 6. Competencies mean that a person can make autonomous use of a high degree of applied theoretical knowledge in combination with mastery of the theoretical bases of that applied knowledge. Tasks may require developed motor skills and significant creative, planning, designing, or supervisory functions related to products, services, operations, or processes. This level corresponds to a competent senior administrator, specialist, technologist, or paraprofessional. Courses of formal vocational education and training to assist in preparing for employment at this level are generally those leading to an associate diploma or a diploma. In some cases, a degree may apply.
- Level 8. Competencies mean that a person has highly developed capacities to generate and use advanced levels of theoretical and applied knowledge. The tasks often require highly developed motor skills and the ability to undertake complex and major creative planning, design, and managerial functions with full personal accountability and responsibility for the output of others. This level corresponds to a competent senior professional or a manager. The formal education and training necessary at this level of employment include content leading to higher degrees. Professional qualifications may also include postdoctoral research, evidence of

publications and contribution to advancing knowledge in particular areas (IEL, 1993, Vol. IV).

This framework allows for transferable skills across industries, elaborates career paths within industries, and ensures a correspondence between earning a degree and acquiring the types of competencies required for working at various levels.

### The United Kingdom Approach

The United Kingdom (U.K.) system has dropped the use of the word "standard" as the primary descriptor of the national qualification system. It has been replaced with the term "competency." This classification system is based on employment functions, not occupations or industries. A National Vocational Qualification (NVQ) is defined as a statement of competence that is clearly relevant to work and intended to facilitate entry into (or progression in) employment and further learning, and that is issued to an individual by a recognized awarding body; and the ability to perform a range of work-related activities and to demonstrate the underpinning skills, knowledge, and understanding required for such performance.

The qualification is derived from what employers and employees in the relevant industrial sector, occupation, or profession deem to be required -- not from an analysis of curricula or other education and training materials. The elements of competence are to include not just the technical requirements of jobs, but the less tangible aspects of performance -- such as teamwork and problem-solving.

In terms of establishing a common nomenclature, the U.K. system specifies how a competency is to be written by defining how its elements are constructed. Elements of competence are to include an active verb, an object, and a condition. All performance criteria are to contain a critical outcome (something that has to be done for the function described by the element) and an evaluative statement that can be either quantitative or qualitative. A range statement is to express the various circumstances in which the competence must be applied and could include physical locations or types of equipment.

Within this format, an overarching framework of common levels has been established. Originally, there were four levels. In 1990, a fifth level was added at the upper tier so that professional qualifications are now being incorporated into the NVQs. Level 3 presumes additional education or training past the compulsory school period. It is anticipated that the fifth level will require a broad body of knowledge and a higher education degree. Not all occupations will require all five levels. The five levels are guided by the following indicators:

- Level 1. Competence in the performance of varied work activities, most of which may be routine and predictable;

- Level 2. Competence in a significant range of varied work activities, performed in a variety of contexts. Some of the activities are complex or non-routine, and there is some individual responsibility and autonomy;
- Level 3. Competence in a broad range of varied work activities performed in a wide variety of contexts, most of which are complex and non-routine. There is considerable responsibility and autonomy, and control or guidance of others is often required;
- Level 4. Competence in a broad range of complex, technical, or professional work activities performed in a wide variety of contexts with a substantial degree of personal responsibility and autonomy. Responsibility for the work of others and allocation of resources is often present; and
- Level 5. Competence involving application of a significant range of fundamental principles and complex techniques across a wide and often unpredictable variety of contexts. Very substantial personal autonomy and often significant responsibility for the work of others and the allocation of substantial resources feature strongly, as do personal accountabilities for analysis and diagnosis, design, planning, execution, and evaluation (IEL, 1993, Vol. IV).

Initially, there was a substantial amount of criticism regarding the "difficulty index" of the levels, particularly Levels 1 and 2. The operational reality appears to be that Levels 2 and 3 are being used as the baseline in the development of the qualifications for the General Certificate for Secondary Education (GCSE), a collaborative effort that includes representatives of different levels of the education enterprise. The purpose of the GCSE is to infuse into the education system a program of study that emphasizes strong technical preparation and is to have "parity of esteem" equal to that of the most rigorous academic-track education.

Some of the core lessons from these other six countries are:

- To promote career progression, there should be commonly recognized levels of progressive complexity based on needs identified in the workplace;
- Competency-based equivalency levels need to be promulgated that reflect the common core of knowledge to be taught in the classroom and learned on the job;
- Each broad competency level should contain internal building blocks or units that can be attained at various points in time and in different learning settings; and
- Literacy requirements are not key drivers of the construct. Rather, they are embedded within the broader forms of competencies.

## Related Activities

At the same time that the National Advisory Commission on Work-Based Learning was building a foundation for a more coherent national skill standards effort, an Advisory Panel on the Dictionary of Occupational Titles (APDOT) was reconstructing and revitalizing the basic occupational classification system used in the United States. Also, a technical advisory group established by the National Education Goals Panel was supporting the organizations establishing academic standards in such areas as science, mathematics and geography. The findings of these two panels reinforced some of the general findings of the IEL study.

The Technical Planning Group for the National Education Goals Panel for Goals 3 and 4 found it necessary to recognize that the word "standard" has several different, and often confusing, meanings. They offer the following distinctions:

"Content standards are to specify what students should know and be able to do. In shorthand they involve knowledge and skills essential to a discipline that students are expected to learn. Those "skills" include the ways of thinking, working, communicating, reasoning, and investigating that characterize each discipline. That "knowledge" includes the most important and enduring ideas, concepts, issues, dilemmas, and information of the discipline. ... Performance standards specify "how good is good enough." They relate to issues of assessment that gauge the degree to which content standards have been attained. ... they are the indices of quality that specify both the nature of the evidence ... required to demonstrate that the content standard has been met and the quality of the student performance that will be needed" (NEGP, 1993, p. ii,iii).

The National Skill Standards Act requires that skill standards include both content and performance. By substituting the word "occupation" for "discipline" where appropriate, we can begin to create a common nomenclature for cross-reference between academic and occupational standards. Several layers of definitions will be required.

The APDOT noted that we are not dealing with a unitary concept in any discussion of academic, occupational, or literacy skills. For voluntary standards to become commonplace, we must develop common terms and concepts that transcend specific domains of interest.

APDOT also found that traditionally the term "skill standards" has not been used in a policy sense but technically -- in application to a variety of circumstances. Indeed, the terms "skill" and "standard" are used for very different purposes. A useful tool in the arsenal of

**Table 1**  
**APDOT CONTENT MODEL - WORKER ATTRIBUTES SECTION**

Below is an abridged version of the taxonomy used in the Directory of Occupational Titles. We have provided descriptors for Section I. This section as well as Sections II, Part B and III relate to skill standards development. The taxonomy provides a framework for classifying information about the worker and the work that is produced.

<b>Database of Occupational Titles -- Categories</b>	
<b>I. Worker Attributes:</b>	Characteristics or qualifications that a worker brings to a job.
<b>A. Aptitudes and Abilities:</b>	The capacity to perform particular classes or categories of mental and physical functions.
<b>B. Workplace Basic Skills:</b>	Fundamental developed abilities that are required to at least some degree in virtually all jobs.
<b>C. Cross-Functional Skills:</b>	The various types of developed generic skills that are related to the performance of broad categories of work activity that tend to occur across relatively wide ranges of jobs.
<b>D. Occupation-Specific Skills:</b>	The developed ability to perform given general or specific work activities that tend to occur across relatively narrower ranges of jobs and/or are defined in relatively job or activity specific terms; these are operationally defined as the ability to perform the generalized work activities and job duties/tasks, defined in Section III, or the ability to use or operate given machines, tools, or equipment, defined in Section II.
<b>E. Occupation-Specific Knowledge:</b>	Understanding or awareness of, or familiarity with, the facts, principles, processes, methods, or techniques related to a particular subject area, discipline, trade, science, or art. Includes knowledge of foreign languages, computer programming languages and specific computer software packages or applications.
<b>F. Personal Qualities</b>	An individual's characteristic, habitual, or typical manner of thinking, feeling, behaving, or responding with respect to oneself, others, situations or events.
<b>G. Interests</b>	Expressed affinity for performing particular types or categories or work tasks or activities, or applying particular types of skills.
<b>H. Licensure/Certification</b>	The type or name of particular state licenses or professional or technical certification programs.
<b>I. Work Experience</b>	The type and amount of either paid job experience (acquired in regular full- or part-time employment, military jobs, paid apprenticeship, internship, or trainee positions) or unpaid job experience (acquired in volunteer or civic activities or in student work-study programs).
<b>J. Formal Education</b>	The type and amount of secondary school, vocational-technical school, college, or university education.
<b>K. Formal Training</b>	The type and amount of learning or instruction, acquired through such means as apprenticeships, certification programs, military training programs, practicums and organization- or association-sponsored training programs (but outside of formal academic or education settings).

standard-setting bodies is what APDOT calls the Content Model (see Table 1), which identifies a skills-related hierarchy of worker attributes. This hierarchy includes aptitudes and abilities, workplace basic skills, cross-functional skills, occupation-specific skills, occupation-specific knowledge, and personal qualities (e.g. interest and experience).

APDOT classifies workplace basics as: "the fundamental developed abilities that are required to at least some degree in virtually all jobs. Examples include: reading, writing and arithmetic or computational abilities. (These are included as a separate descriptor category because, although related to aptitudes and abilities, they include significant knowledge and learning components)" (p. 33).

Embedded in the APDOT category of cross-functional skills are the core competency skills identified by SCANS, including "the various types of developed generic skills that are related to the performance of broad categories of work activity that tend to occur across relatively wide ranges of jobs. Examples include: information gathering, oral communication, problem analysis, negotiating, organizing and planning, coordinating with others and coaching/mentoring" (p. 33).

Kenneth Pearlman, a member of the APDOT who has written widely on personnel selection; job and skill analysis, and person-job matching, has identified the need for a common skills language. He notes that different classes of skills are not equally: 1) specific, 2) transferable or portable, 3) trainable, 4) relevant to different purposes, or 5) measurable. The meaning of the term "skills" varies considerably, Pearlman says, and often includes: 1) traits or personal characteristics, 2) broad aptitudes, 3) basic skills, 4) generic competencies, 5) specialized proficiencies, and 6) specialized knowledge (Pearlman, 1993).

IEL's study found similar problems regarding standards, in that they often mixed time versus skill, and minimum qualifications versus optimal performance. The concept of measurable performance standards is variously used -- both narrowly, to refer to demonstration of ability to complete work-simulation task, and broadly, to refer to any type of individual assessment (IEL, 1993, Vol. I).

There is little doubt that there will always be multiple meanings involved in the everyday usage of any of these terms. However, for the purpose of linking academic, occupational and literacy skills, the development of common terminology must be a priority.

### **THE IDEAL SKILL STANDARDS SYSTEM**

According to the IEL baseline study, the ideal skill standards system would center around the needs of individuals and employers and would incorporate the following characteristics:

- It would be widely accessible to students and workers regardless of age;
- It would respond to changes and differences in local and individual needs through flexibility in education and training provided (e.g., types of institutions, full-time versus part-time);

- It would be able to meet the needs of individuals regardless of the types of education and training they are pursuing (e.g., initial preparation, continual, upgrading, or remedial);
- It would allow career paths within and between industries;
- It would be explicit, so that firms, educators, training providers, and individuals know what the standards are and where information about them can be obtained;
- It would be competency-based;
- It would formally assess and certify an individual's skills that have been documented by a third party;
- It would be progressive, so that people can build upon blocks of competencies and adapt to technological, organizational and market changes to improve their prospects or to explore their potential;
- It would have a common framework and use common language when describing skill levels across industries and occupations, so that both individuals and employers can understand easily workplace expectations. The framework should progress from initial (entry) qualifications through several levels to mastery and/or specialization recognition (IEL, 1993, Vol. I).

The ideal system assumes that a wide range of programs and providers can adapt the content standards to their specific missions and purposes and develop specific program performance standards accordingly. Using federal programs as an example, the system envisions that it would eventually be feasible (without violating the discrete purposes of authorizing legislation for such programs as work-based literacy, adult education, bilingual education, JTPA, Perkins II, small business assistance, and the programs that support Advanced Technology Centers) to use the standards as a common basis for designing program content.

The NALS analysis regarding literacy levels within the total U.S. population is a powerful reminder that academic and occupational skill standards cannot be for only a select portion of the population. They must be eventually understood by all citizens as the norm and considered obtainable. There is little utility in debating whether or not the standards should be set to meet minimum levels of competencies or maximum levels. At least for the skill standards, they should be set to meet the requirements of an ever-changing world of work; therefore, they must be high and absolute, and at the same time be accompanied by a substantial focus upon access, opportunity, and support for all segments of the population.

Recall the components of the ideal system in which time, age and place would not be as limiting as they are today in terms of access to learning opportunities for individuals. Implicit in such a vision is the assumption that all providers of education and training would have access to

and would use the standards in developing curricula and instruction, whether for training at the work-site, in second-chance programs, or in mainstream educational institutions.

The United Kingdom model of skill standards warrants attention because it uses units of specialized skills for major occupational clusters. It would be possible for employers to identify a set of units for which a particular training program could be established. The units could be used to define the content of the program as well as criteria for assessing participants during their brief time spent in it. The participants would collect units of proven competencies and could add to them later as desired or needed. This approach would be of value for at-risk populations in occupational training.

If the aforementioned ideal system were in full force, any individual upon enrolling in an associate or bachelor's degree program would be given academic credit for recognized competencies previously attained, thus saving both the individual and the public the unnecessary expense of requiring the individual to take essentially redundant courses to attain a degree. This approach will therefore require substantial negotiations among the stakeholders in the system.

### **KEY TASKS OF THE NATIONAL SKILL STANDARDS BOARD**

The NSSB is charged with developing several new tools to achieve its goals, and has several assignments to undertake. It is to:

- identify broad occupational clusters for skill standards around which to organize the voluntary system;
- recognize voluntary partnerships; and
- establish objective criteria for purposes of endorsements.

Standards are to:

- provide credentials (through formal assessments);
- be used by institutions of higher education, labor organizations, trade associations and employers providing formalized training; and
- be used by School-to-Work Opportunity Systems explicitly.

What follows is a brief discussion of the individual tasks.

## **Identify Occupational Clusters**

One of the first activities of the NSSB is to establish broad occupational clusters that share characteristics appropriate for the development of a national system of voluntary skill standards. The statute calls for wide consultation with all stakeholders prior to establishment of these clusters, and several factors will need to be considered in their selection. The clusters, organized around common skill sets, must be sufficiently broad so that individuals do not become trapped in narrow, job-specific programs of study. Individuals need opportunities to map courses of career growth for several different job settings, whether within a cluster or across clusters; and clusters need to accommodate employment trends as new occupations emerge and others fade away.

The current state of affairs regarding occupational clusters is that there are seven different federal occupational/industrial classification systems, ranging from narrow to very broad. However, there are plans within the federal government to update and consolidate some of these classification systems and it will be important to have a sustained dialogue among the NSSB and those federal agencies responsible for the classification systems.

Classification systems are abstract constructs that serve many useful purposes, but if their promise is to be realized, there must be a strong sense of ownership regarding occupational clusters. The operative question should be: "Who is the most important stakeholder group to use the skill standards?" The answer can only be: the employer community. If employers do not participate in the skill standards system as developers and users it will have no value.

The NSSB will have to maintain an industry-driven perspective -- a difficult task, considering the fact that most large firms cut across multiple industry groupings and hire from several different occupational groupings. Additionally, very few industry-based trade associations' "charters" adhere to the occupational/industrial classification systems of the federal government. Because of these factors, employers and organized labor will need to be comfortable with using occupational clusters and perhaps skill-based sub-clusters within and across them.

While meeting the needs of employers, occupational clusters, selected by the NSSB must also be meaningful for secondary and post-secondary educational institutions, apprenticeship programs, other work-site trainers, and developers of study programs and articulation agreements among education and training institutions -- Tech Prep programs, for example.

## **Recognize Voluntary Partnerships**

Recall that voluntary partnerships are to have "full and balanced" participation of business, employee representatives and individuals with expertise in measurement and assessment, and where applicable, trade associations that have received grants from the Departments of Labor or Education. The employee representatives are to include persons recommended by recognized national labor organizations representing employees in the occupation or industry and other nonmanagerial employees with experience in the occupation or industry. In addition,

representatives from educational institutions, community-based organizations, state and local governments and non-governmental civil rights organizations are to be included. A key lesson emerging from the 22 demonstration projects is that creating and maintaining a viable coalition requires partnering among disparate groups and can be a time-consuming and difficult process.

Among factors the NSSB will have to address when establishing the criteria for recognizing partnerships are:

- How many partnerships will be recognized? Only one for each broad cluster? Several within a cluster?
- How will "full and balanced" be defined? If employers are recognized as the major consumer of the products, classification services, how does this affect the definition?
- What range of activities will the partnerships be expected to perform?
- Will there be quality assurance provisions that a partnership must adhere to in order to maintain recognition? If so, for what purposes?
- Can there be more than one classification of a partnership? For example, could existing apprenticeship programs be recognized as partnerships?
- Will all of the partnerships be expected to follow a common approach in expression of the standards, or will they be allowed to go their own way?
- What will be expected in terms of the scope of the standards? Will one set of standards suffice for all purposes (e.g., to identify foundation and cross-cluster knowledge and skills, as well as occupational skills and broad knowledge)?
- What are the probabilities of the partnerships surviving and thriving without federal government support?

These questions do not have easy and obvious answers. As the needs of the different stakeholders vary, links will have to be established between the various networks of interest.

One of the most impressive features of current certification programs is the willingness of volunteers to contribute substantial time and energy to them. However, volunteers cannot do it all. Most industry-driven programs are able eventually to become self-sustaining by charging a variety of fees for different parts of the certification program. The speed of standards development and the quality of the product and services generated are directly related to whether up-front seed money is provided by the parent trade association or professional society. Total cost varies, but several hundred thousand dollars and many hours of the voluntary time of experts are required in order to launch a substantial and credible program. Current education-driven programs simply would not exist if support from the Carl Perkins legislation was not

available. There will be a need to plan for the fiscal sustainability of the partnerships prior to finalizing the criteria for them.

### **Establish Objective Criteria**

The NSSB is to establish objective criteria for these purposes:

- to provide credentials (through formal assessments);
- to be used by institutions of higher education, labor organizations, trade associations, employers providing formalized training; and
- to be used by School-to-Work Opportunity Systems explicitly.

### Credentials and Assessment

Results of formal assessments go to the heart of why most employers are willing to support a skill standards initiative. The creation of such competency-based assessments that merit employer trust would clearly imply some form of third-party involvement, as well as recognition that assessment cannot be just a one-time event. Several different forms of assessments -- such as grades, portfolios, paper-and-pencil tests, and performance assessments -- will be needed throughout the education and training life cycle of an individual.

The respectability of credentials will be based on the real and perceived value of assessments of the knowledge, skills and abilities of an individual, and a first order of business will be to focus on what types and forms of assessment tools will be most valued and used by employers. Issues that must be part of the assessment agenda include (but are not limited to): 1) how to have and maintain sufficient quality assurances regarding administration of assessments; 2) how to promote recognition of assessments across industry sectors, particularly for basic and cross-functional skills; and 3) how to align, when appropriate, common scaling levels for select performance standards that can be promoted and used in the education and training enterprise as well as in the workplace. The latter two issues relate directly into work already undertaken by the federal government in the development of the NALS and National Job Analysis projects.

The whole assessment arena, especially the area of competency-based assessment, requires continued research and development in order to improve both theory and practice.

### Use by Higher Education, Labor, Trade Groups and Employers

A range of actions needs to occur in order to promote recognition of credentials received, from whatever setting, by the various institutions involved. State governments, higher education policy boards, the various accreditation bodies overseeing recognition of colleges and universities must be consulted. The American Council on Education's Commission on Educational Credit and Credentials needs to be actively engaged in these consultations, since this body protects the integrity of academic credit and credentialing and provides recognition for adult learning.

It may well be necessary for the NSSB to explore the possibility of promoting the development of new "program approval" accreditation systems in order to include within its reach the thousands of education and training providers in the public and private sectors.

### Explicit Use In School-to-Work Opportunity Systems

There is a legislative requirement in the recently passed School-to-Work Opportunities Act (STWO) that education programs developed under that legislation be accompanied by a "portable credential." Indeed, there is an explicit reference to utilizing the credentials developed and recognized by the NSSB. It will be some time, however, before NSSB recognitions occur.

This does not mean everything must be placed on hold. To the contrary, both the Goals 2000 and the STWO Acts represent opportunities for capacity building and infrastructure development. There is an opportunity, for example, to encourage collaborative projects between interested skill standards pilot projects and states and localities that have been awarded implementation grants under the STWO Act. Such teamwork engages education and training providers in development of standards-related curricula and in testing assessments forms being considered by the skill standards pilot projects.

The STWO legislation also requires states and localities to ensure that students are exposed to "all aspects of the industry," a term adopted from the Perkins Act. There have been substantial problems in defining the term, along with substantial involvement in definition by the industry-based organizations that have identified occupational requirements for critical jobs in their industries. These same organizations could help produce materials for students, counselors and curriculum developers that would address industry-specific needs.

### **Quality Assurance Functions**

The NSSB has several quality assurance functions, to be established through a variety of endorsements. The endorsements must take into account:

- international standards;
- requirements of high performance work organizations;
- apprenticeship standards; and
- content and performance standards certified by the National Educational Standards and Improvement Council.

### International Standards

The legislation requires the NSSB to, "take into account relevant standards used in other countries and relevant international standards." The current pilot projects are required "wherever possible" to ensure that standards are "benchmarked to world-class levels of industry performance." While the focus on the international in the legislation is in part borne of competitive concerns, the fact is that many of our major trading partners have extensive experience with national standards that U.S. standards developers can profit by examining.

As part of the technical assistance effort in support of its skill standards pilot projects the DOL funded the National Alliance of Business and a subcontractor, the National Center on Education and the Economy, to prepare benchmarking guides for each of the DOL projects. Guides were developed to examine standards from other countries and provide detail about the education and training system within which each standard operates, the form of the industry in each country, and comparison information about the individual standard. A significant contribution of this effort has been the translation of other nations' occupational standards into English.

From the perspective of these guides the purpose of benchmarking "is to identify ways to continuously improve performance," with the goal being not to copy another's standard or approach, but to "understand the factors which contribute to best practice in order to meet or exceed it.

### High Performance Work Organizations

Much like the term "all aspects of the industry," the term "high performance work organization" conveys a useful concept but has not yet been precisely defined. However, a number of the characteristics of high performance have been identified and the process of classifying the skills required in a high performance workplace has been begun by the Office of the American Workforce and others. The current 22 pilot projects have each been asked to search for the differences in skill requirements in high performance work organizations versus "traditional" workplaces. American College Testing (ACT), as a part of the National Job Analysis study, is working with several of the pilot projects and the National Alliance of Business to document the variations in skill requirements in high performance work organizations. Their experiences should provide an important knowledge base for the NSSB to build upon. This is clearly an area ripe for substantial research and aggressive piloting of projects.

### Apprenticeship Programs

Many apprenticeship programs already have skill standards. In fact, some of them could clearly be called "world class" in terms of training quality and respect for workers' skills. Such programs often embed assessment within teaching and learning processes yet involve third parties in quality-controlled assessments.

A key issue will be sorting out the relationship between the existing Department of Labor registration process for apprenticeship programs and the coming recognition process of the NSSB for standards development programs.

The costs for the apprenticeship model of training and credentialing are often supported by a self-imposed tax employers pay as a result of collective bargaining agreements or of choosing to sponsor programs using such a model. In most joint organized labor/employer programs, apprentices do not bear any of the related training costs nor are testing fees required. However, there are no requirements that an approved program include such quality assurance mechanisms as testing or performance measurement, a lack that has, in some instances, caused problems in portability of credentials from one community or state to another.

### National Educational Standards

As shown earlier, Australia and the United Kingdom link the academic knowledge base and career progression and specialization in the workplace. Both countries wanted to construct a framework that could be transparent, easily understood, and used by a wide variety of individuals and public and private institutions. Both countries also wanted the levels to be broad-based in order to incorporate cross-functional and generic skill requirements, not just occupation-specific details, and to have a number of levels that is manageable, yet reflective of progression.

APDOT member Kenneth Pearlman has identified factors to be considered in developing an integrated system. These factors include breadth/narrowness of definitions, transferability across jobs/settings, modifiability/trainability, relevance to different purposes, means of measurement, and reliability and validity of measurement.

The NSSB and education stakeholders such as the National Education Goals Panel should agree on the best ways to describe content standards and assess performance levels for different skill categories (e.g., aptitudes and abilities, cross-functional skills, workplace basics, and occupation-specific skills and knowledge) required in the workplace. This agreement must address how both the content and the performance standards reflect progressively complex sets of levels of knowledge and skills mastery required for an individual's career entry and progression into specialization or management positions. A substantial amount of attention needs to be given to the issue of levels and scales, and a method to foster linkages between the NSSB's skill standards activities and the education community's academic content and performance standards activities needs to be considered.

In all countries studied, one of the most difficult issues is the equivalency or scaling factor. Equivalency here means alignment of workplace requirements with the program content of education and training services.

It would be comfortable to use attainment of a specific diploma (e.g., high school, associate degree) as the basis for establishing the scaling levels, but more specificity and rigor is required along several dimensions. For example, American College Testing (ACT), one of several organizations developing commercial work-readiness tests, has found that employers

want discrete levels of proof of competencies in such content areas as mathematics and science. To accommodate this demand, ACT's product identifies seven levels of applied academic performance scales.

Experience in other countries has shown that establishing equivalency levels is a politically negotiated process among the relevant stakeholders. An example in this country is the General Equivalency Diploma (GED), a voluntary equivalency standard for academic skills and knowledge. The GED exam is a politically negotiated scaling device that is periodically updated through a validation process using high school graduation requirements from all states. This process develops national norms. Each state adopts its own scale (based on its own graduation requirements) to determine a candidate's score in the state. This approach has proven to be a good way to promote voluntary usage of de facto national standards for high school graduation. Unfortunately, the initial state standards from which GED exams were drawn were quite low. Hopefully, as states adopt national content standards, the GED will ratchet the exam up to higher levels. For occupational skill standards, which are rooted in the requirements of the workplace and need to be accepted across the country, such flexibility to negotiate a performance scale is somewhat problematic.

### **Endorsement Criteria**

Once endorsement criteria have been established, they are used to ensure that standards will be:

- compatible with existing federal civil rights laws;
- updated regularly; and
- portable across industries and occupations (when appropriate), geographic areas, and institutions of education and training.

Additional criteria may be applied subsequent to public comment.

#### Compatibility with Existing Federal Civil Rights Laws

The United States has become a world leader in terms of making civil rights laws and regulations compatible with occupational/job analysis and assessment -- a task that is crucial to effective policy-making. In interpreting Title VII of the Civil Rights Act, the U.S. Supreme Court has held that if an occupational assessment test has an adverse impact on a class protected by the legislation, the test must be shown to be valid to be used. The courts have not agreed on a uniform set of standards for which assessments are legal and which are not, but the evidence to date argues to use only methods and tests whose validity can be established through some form of job analysis (IEL, 1993, Vol. I, p. 5).

It is relatively easy to document and assess the occupation-specific skills and knowledge required in narrow and discrete jobs. A review of credentialing programs operated by professional and industry-based associations reflects the capacity to perform these tasks. What is

more difficult and expensive is to validate workplace basics, and cross-functional skills and abilities.

The U.S. Department of Labor is supporting new research in validation of the generic skills required in most workplaces. In addition to the 22 pilot projects to establish occupation-specific skill standards for broad occupational clusters, there is an effort underway to validate generic, cross-occupational workplace competencies in numerous jobs through the National Job Analysis Study (NJAS).

This project is building upon the SCANS framework, which contains foundation skills in three areas: basic skills, which include reading, writing, arithmetic/mathematics, listening, and speaking; and two other categories of thinking skills and personal qualities such as working as a team member. Additionally, SCANS identified five competency categories -- management of resources, interpersonal skills, use of information, understanding of systems, and use of technology. These SCANS skills, once validated, can provide yet another important screen in the development of a common framework.

SCANS provided definitions for workplace basic skills and broad cross-functional skills just as the Literacy Definition Committee defined literacy, as required by Congress with the passage of the Adult Education Amendments of 1988. The Committee recognized that literacy is not a single skill suited to all types of texts, but rather an ordered set of skills needed to accomplish diverse types of tasks (National Center for Education Statistics and Education Testing Service, 1993, p. 3,4).

The National Job Analysis Study will use traditional job-analysis techniques to validate the SCANS taxonomy, with a slight twist in the process. Normally, job analysis is undertaken to highlight differences among occupations. In this instance, the effort is to gather information on similarities across occupations. If the validation study supports the notion of generalizable workplace basic and cross-functional skills, it should be possible to establish a definitive foundation on which to base assessments, work training programs, educational curricula, and comprehensive descriptions of job requirements (American College Testing, 1993). Clearly more research and development work is in the offing in this area.

### Regular Updating

The criteria that standards be updated regularly is essential, and it should be relatively easy to establish the parameters around which partnerships can achieve it. However, there are costs involved. Partnerships may become responsible for updating occupation-specific skills on a scheduled basis, with the federal government assuming responsibility for updating cross-functional skills across all occupations on a different, less frequent time frame. Workplace basic skills are less volatile in terms of shifting requirements than technical skills.

Attention to regular updating helps interested parties keep up with technology shifts and changes in workplace organization. Regular updating will allow individuals to remain informed about new and emerging credentials valued by employers.

## Portability

Portability issues will need to be considered in almost every area of NSSB decision-making. Critical areas include selection of occupational clusters, determination of the responsibilities for partnerships and negotiations with institutions of higher education and other education stakeholders such as the National Education Goals Panel. For the skill standards effort, acceptance of an array of different credentials -- certifications and assessment results in addition to academic credit -- by employers, industries, certifying groups and educational institutions are all part of making worker skills portable. Thus there are complex relationships between employers, certifying groups, educational institutions, organized labor, and workers that have to be worked out on an industry or industry cluster basis that will shape the dimensions of portability in the ultimate system. The speed with which employers utilize credentials and assessments emanating from the skill standards effort for the purposes of recruitment and promotion will be a chief determinant in the concept of portability. This will place a heavy responsibility on the partnerships to market the skill standards and assessments to employers.

In order for the credentials to be recognized by a wide array of employers and institutions of higher education the NSSB will need to address and then assist partnerships in examining the skill overlaps between their cluster and those of other clusters. Clearly the workplace basic and cross-functional levels (see the description of the content model - page 17) are of particular importance in terms of job mobility across an array of occupations. A key challenge will be to develop common standards and easily utilized forms of assessments in these two skill areas which can be adopted by education and training institutions to guide initial occupational preparation.

In order to ensure the development of a coherent infusion strategy of new portable credentials it may be prudent for the federal government's new School-to-Work Office to join forces with the NSSB in the sponsorship of nationwide projects which focus on the promotion of common assessments and credentials for new entrants into the workplace.

## **Infrastructure**

A task of the NSSB will be to develop an infrastructure to support its total effort. This task will be accomplished through:

- conducting research;
- identifying and maintaining a catalog of skill standards (domestic and international);
- acting as a clearinghouse and facilitator;
- developing common nomenclature relating to skill standards;
- encouraging development and adoption of curricula and training materials;

- providing technical assistance to partnerships; and
- promoting the development of a coherent system.

The Goals 2000 legislation wisely recognizes the cost-efficiency and effectiveness of a centralizing the identification and maintenance of international standards. This will help standards users benefit from the experiences of other countries in the establishment of high standards as well as development and adoption of curricula and training materials. For example, other countries have found that is essential to have "translation agents" to move standards into the education and training enterprise, and have developed new organizations to continuously translate skill standards into curricula, update curricula and instructional materials, pilot-test the materials and make them widely available to all types of education and training institutions. Such linking organizations in this country could be responsible for ensuring that programs of study were sufficiently broad and sufficiently focused -- admittedly, not an easy task. The essential point is that industry representatives, state governments, and especially the representatives of secondary and post-secondary institutions must come together and agree upon a common agenda. There can be no single prescription, but new and different inventive solutions will be essential.

### **The Potential but Not a Promise**

There are opportunities to be seized by the establishment of the NSSB. Students and their parents would be able to make more informed choices. All parts of the far-flung education and training enterprise would have better tools to communicate with their "customers" and each other. Employers and employees alike would be able to use and benefit from the products and services emerging from the partnerships. However, if there is any perception that the NSSB will generate more governmental interference in the private sector, it will be seriously hampered. If it's viewed just as part of an accountability system, it will not be trusted by the education and training community. If attainment of the credentials does not result in improved hiring and career promotion and/or increased wages for the individual worker, it will be scorned. These are all real possibilities.

The NSSB will be a failure if it becomes isolated from the ongoing policy development and implementation activities of the federal government. It is essential that federal agencies establish ongoing mechanisms whereby the work of the Board informs their work, and vice versa; the same is true for state governments, business and trade associations, organized labor and education and training providers.

Critical lessons which have been learned during the piloting phase will need to be borne in mind as the work of the NSSB unfolds. A major lesson is the need for patience; it takes time to build the coalitions between the different stakeholders who must be involved. Other lessons include: (a) engaging small businesses and current job incumbents in the validation of skill requirements requires special efforts, (b) developing levels of trust in the workplace that standards can help current employees either maintain their current jobs or more easily find new ones needs attention, and (c) assessments of skills, conducted in ways which are reliable and valid yet cost efficient will need substantial attention for some time to come.

The need for common nomenclature has emerged as a critical concern across the total effort. Development of a common and easily understood framework which ensures that content and performance standards are simultaneously broad enough to promote a wide array of occupational choices for individuals yet specific enough to interest an employer concerned about specialty skills when hiring and promoting employees is important. The need to find cost-efficient ways to make the materials available to education and training providers has emerged as key lesson from the pilot phase. Sustainability of the effort on the part of the private sector after the federal support is no longer available is increasingly being recognized as a critical consideration which the NSSB will need to address. These are all valuable lessons from the pilot phase which can help focus the NSSB efforts as it moves into the next generation of work in this arena.

Ultimately, the Board and the partnerships need to become part of the on-going business of doing business in all of our institutions concerned with the issues of competitiveness, workforce preparation, and the workplace itself. Only then is there a possibility that the promise of skill standards can be realized.

## BIBLIOGRAPHY

### American College Testing

- 1993 *Performing A National Job Analysis Study: Overview of Methodology and Procedures.* Iowa City, IA: American College of Testing.

### Advisory Panel to the Dictionary of Occupational Titles

- 1993 *The New DOT: A Database of Occupational Titles for the Twenty-First Century.* Washington, DC: U.S. Department of Labor

### Carnevale, Anthony P.; Gainer, Leila J. and Meltzer, Ann S.

- 1990 *Workplace Basics: The Skills Employers Want.* San Francisco, CA: Jossey-Bass.

### Commission on the Skills of the American Workforce

- 1990 *America's Choice: high skills or low wages!.* Rochester, NY: National Center on Education and the Economy.

### Gardner, David P., et al.

- 1983 *A Nation at Risk: The Imperative for Education Reform.* Report of the National Commission on Excellence in Education. Washington, D.C.: U.S. Government Printing Office.

### William T. Grant Commission on Work, Family, and Citizenship

- 1988 *The Forgotten Half: Non-College Youth in America.* Washington, DC: The William T. Grant Commission on Work, Family, and Citizenship.

### Johnston, William B. and Packer, Arnold H.

- 1987 *Workforce 2000: Work and Workers for the 21st Century.* Indianapolis, IN: Hudson Institute.

### Institute for Educational Leadership

- 1993 *Skill Standards in the U.S. and Abroad.* 4 Vols. (Vol. I: *An Overview of Skill Standards Systems in Education and Industry* and Vol. IV: *Skill Standards Systems in Selected Countries*), Washington, DC: Institute for Educational Leadership.

### National Center for Education Statistics and Education Testing Service

- 1993 *Adult Literacy in America: A First Look at the Results of the National Adult Literacy Survey.* Washington, DC: U.S. Government Printing Office

## BIBLIOGRAPHY, continued

The National Center for Research in Vocational Education.

1984 *The Unfinished Agenda: The Role of Vocational Education in High School*. Report of the National Commission on Secondary Vocational Education Columbus, OH: National Center for Research in Vocational Education.

National Education Goals Panel

1993 *Promises to Keep: Creating High Standards for American Students*. Report of the Goals 3 and 4 Technical Planning Group on the Review of Education Standards. Washington, DC: National Education Goals Panel.

National Governors' Association

1986 *Time for Results*. Washington, DC: National Governors' Association.

Parnell, Dale

1985 *The Neglected Majority*. Washington, DC: Community College Press.

Pearlman, Kenneth

1993 *The Skill Standards Project and the Redesign of the Nation's Occupational Classification System*. Washington, D.C.: U.S. Department of Labor.

Sivan Y. Y.

1993 "The Pandora's Box of Standards for Education." *Technos*, Summer: pp. 19-21.

U.S. Department of Education and U.S. Department of Labor

1994 *Occupational Skill Standards Projects*. Washington, DC: U.S. Department of Education, Office of Vocational and Adult Education.

U.S. Department of Labor

1988 *Apprenticeship 2000*. Report of public comments. Washington, DC: U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training.

U.S. Department of Labor

1989 *Investing in People*. Report of the Commission on Workforce Quality and Labor Market Efficiency. Washington, DC: U.S. Department of Labor.

## SKILL STANDARDS DEMONSTRATION PROJECTS

Industry	Grant Recipient
Advanced High Performance Manufacturing	Foundation for Industrial Modernization
Agricultural Biotechnology	National FFA Foundation
Air-conditioning, Heating, and Refrigeration	Southern Assoc. of Colleges & Schools V-TECS
Automobile, Autobody, Medium/Heavy Truck Technician	National Automotive Technicians Education Foundation
Bioscience	Education Development Center
Chemical Process Industries	American Chemical Society
Computer Aided Drafting and Design	Foundation for Industrial Modernization
Electrical Construction	National Electrical Contractors Association
Electronics	Electronics Industries Foundation
Electronics	American Electronics Association
Grocery	Grocers Research & Education Foundation
Hazardous Materials Management Technology	Center for Occupational Research & Development
Health Care	Far West Laboratory for Educational Research & Development
Heavy Highway/Construction & Environmental Remediation	Laborers-AGC Education & Training Fund
Hospitality and Tourism	Council of Hotel, Restaurant & Institutional Education
Human Services	Human Services Research Institute
Industrial Laundry	Uniform and Textile Service Association
Metalworking	National Tooling and Machining Association
Photonics	Center for Occupational Research & Development
Printing	Graphic Arts Technical Foundation
Retail Trade	National Retail Federation
Welding	American Welding Society

## GLOSSARY OF ACRONYMS

ACE	American Council on Education
ACT	American College Testing
APDOT	Advisory Panel on the Dictionary of Occupation Titles
ASE	Automotive Service Excellence
DOL	[United States] Department of Labor
GCSE	General Certificate for Secondary Education [of the United Kingdom]
GED	General Equivalency Diploma
IEL	Institute for Educational Leadership
JOBS	Job Opportunities and Basic Skills
JTPA	Job Training Partnership Act
NALS	National Adult Literacy Survey
NEGP	National Education Goals Panel
NESIC	National Education Standards and Improvement Council
NGA	National Governors' Association
NJAS	National Job Analysis Study
NSSB	National Skill Standards Board
NTB	National Training Board [of Australia]
NVQ	National Vocational Qualification [of the United Kingdom]
SCANS	Secretary's Commission on Achieving Necessary Skills
STWO	School-to-Work Opportunities [Act]