DOCUMENT RESUME

ED 410 461 CE 074 653

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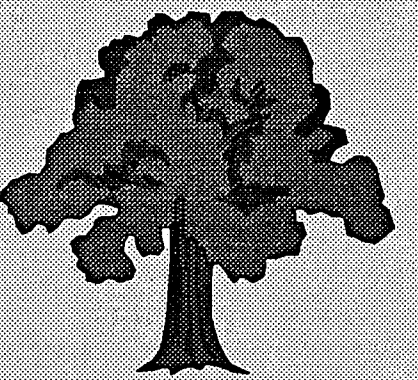
TITLE	Standards: Making Them Useful and Workable for the Education Enterprise.
INSTITUTION	Institute for Educational Leadership, Washington, DC.
SPONS AGENCY	Office of Vocational and Adult Education (ED), Washington, DC.
PUB DATE	1997-05-00
NOTE	85p.
CONTRACT	LC92008001
PUB TYPE	Reports - Research (143)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	Accreditation (Institutions); Career Education; Evaluation Methods; Industry; Information Systems; Integrated Curriculum; *Job Skills; *National Standards; Networks; *Occupational Clusters; *Occupational Information; Postsecondary Education; Program Effectiveness; Role of Education; Secondary Education; Staff Development
IDENTIFIERS	*Goals 2000

ABSTRACT

A review of the standards developed through 22 national occupational skill standards pilot projects funded by the Departments of Education and Labor focused on how they are being used in education and how to improve their use. Although occupational clusters have long played a role in education, the mix of clusters and the use of them varies widely across states. Academic-vocational integration, another standards-related issue, is hindered by lack of a framework of information about career pathways and career progression. Foundation skills identified by the Secretary's Commission on Achieving Necessary Skills have been supported by the pilot projects. The education enterprise needs to incorporate these skills throughout the learning process. There is a need for a support system to help translate industry and occupation standards into useful material for curriculum and instruction. Elements of such a system include the following: relevant assessment and testing tools, a program approval or accreditation process, staff and leadership development, information systems and services, and national and state networks. Among the recommendations for the National Skill Standards Board are the following: support expansion of current consortia/networks; promote cross-agency, standards-driven staff development; infuse standards into career guidance materials; enhance information collection; develop a roadmap to clarify equivalencies between workplace requirements and education needed; and use International Standards Organization processes for quality assurance standards. (KC)



STANDARDS: MAKING THEM USEFUL AND WORKABLE FOR THE EDUCATION ENTERPRISE

Office of Vocational and Adult Education
U.S. Department of Education

STANDARDS: MAKING THEM USEFUL AND WORKABLE FOR THE EDUCATION ENTERPRISE

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under
Contract LC92008001

May 1997

Acknowledgements

This is paper represents the final product developed under a contract with the Department of Education. The Institute for Educational Leadership's Center for Workforce Development (CWD) has been providing technical assistance to the 22 national skill standards pilot projects under this contract and an earlier one through the Department of Labor. My thanks go to Carolyn Lee at the U.S. Department of Education for her patience and assistance throughout this contract and to Michaela Meehan at the U.S. Department for her assistance in the earlier Labor Department contract. I also want to thank Carolyn's colleagues at the Department of Education who provided valuable comments to an earlier draft of this paper.

The 22 skill standards projects have been the reason much of the information cited in this paper was developed and have formed the basis of CWD's research which is cited in this paper. I am grateful to them for remaining as willing guinea pigs for so long as these important topics are thrashed out. Most specifically in the preparation of this paper, Sri Ananda of West Ed Labs, Ruth Loring at CORD, and Judy Leff of the Education Development Center have been very generous with their time and information.

In gathering, checking, and refining data for this paper, a number of individuals have been helpful. I want to acknowledge the assistance of Maggie McNeely at U.S. Department of Education's Office of Educational Research and Improvement; Barbara Clemmons at the Council of Chief State School Officers; and Dawn Krusemark at the American Federation of Teachers.

This paper was improved greatly by the insights and comments of four excellent reviewers, Evelyn Ganzglass of the National Governors' Association, Patricia Mackey Stone of the National Employer Leadership Council, William Weisgerber, a member of the National Skill Standards Board and the former State Director for the Michigan Department of Education's Office of Career and Technical Education, and Gary Hoachlander of MPR Associates. I appreciate their willingness to review the paper. Their comments enriched the final.

My thanks also to my colleague at the CWD, Barbara Kaufmann, for her overall assistance in getting this paper out the door. I appreciate her support in the research effort, in the editing of the document, and her assistance in the graphics and other details surrounding this paper.

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EXECUTIVE SUMMARY

This white paper focuses on "taking stock" of how standards, most specifically how skill standards, are being used within the education enterprise and the ways they could be used more efficiently and effectively. It builds upon lessons learned over the past five years from 22 national pilot projects charged with the development of skill standards. Lessons are drawn from states' efforts to build standards into education reform efforts, with a special emphasis on the systemic change efforts promulgated under the School-To-Work Opportunities Act (STWOA) of 1994. To some extent, states' lessons in developing more connected workforce development systems are appraised. The beginning efforts of the National Skill Standards Board (NSSB) are considered and the roles of various federal and state agencies are explored. The purpose is to look to the future.

The Value of Standards for the Education Enterprise

Why skill standards matter to the education enterprise is best summed up in the following quotation.

> "The primary objective of any skill standards initiative should be to improve the content and instructional quality of education programs. Skill standards have been promoted as a way of motivating all students to learn by focusing their attention on the academic knowledge and skills they will need for success in the workplace, at home, and in their community. Beyond simply increasing the caliber of instruction, a skill standards system should help students select from a number of career and life pathways. Standards should introduce students to the range of educational options and careers available, and provide them with information on the type of academic and workforce preparation they will need to find employment in the industry and occupation of their choice. At their most specific, industry standards can help students gain the advanced skills they will need to find immediate employment in the occupation of their choice" (MPR,1996).

Building an Infrastructure

A central feature of the National Skill Standards Act of 1994 is that a range of interested parties must be involved in the development and implementation of a voluntary skill standards system. This paper is about one of those stakeholder groups -- the education enterprise. The legislation assumes the education enterprise shall simultaneously be:

- ✓ a funnel within which the standards will be spread to students and institutions alike;
- ✓ a user of the standards to develop curriculum and instructional materials;
- ✓ a generator of portable skill certificates; and,
- ✓ evaluated, in part, based upon the standards.

Explicit criteria in the STWOA drives home the need for state and publicly funded education institutions to adapt and adopt nationally validated skill standards for multiple purposes; such as,

development of integrated curriculum, constructing career pathways information systems, engaging the private sector in STW efforts, and issuing certificates of competencies. This initiative builds upon prior work undertaken by state vocational education agencies that have developed an array of industry based standards materials.

Rich lesson exists due to funding in the past five years of 22 national skill standards pilot projects by the U.S. Departments of Labor (6) and Education (16). An array of organizations were given lead responsibility to organize stakeholder groups to help determine the potential of developing a national voluntary skill standards system. One of the most fundamental lessons was the need to develop a common language. The word standards has several different meanings within the education enterprise. Clarity is essential. A growing consensus is emerging that it is essential to recognize several different types of skill standards: *core academic, generic workplace readiness, industry core, occupational family, and occupational or job specific.* For the education enterprise such distinctions help in the organization of curriculum and instructional materials.

The paper probes the following specific standards-related issues and their relationship to the education enterprise.

Occupational Clusters, Career Majors, and Programs of Study

An important assumption is that some form of clustering of occupations and industries is a prerequisite for standards to become powerful tools in education reform and strengthening the workforce development systems in our country. This assumption has taken many forms. For example: 1) the legislation required the first task of NSSB to be the establishment of broad occupational clusters for which skill standards will be developed; and, 2) states could not receive STW implementation grants without developing strategies to establish career majors/clusters and programs of study.

The education enterprise has long used the tool of clustering for a variety of purposes. The renewed emphasis on clustering connected to standards can be considered as a "back to basics" strategy. It is simply a way to organize information about career pathways and educational and workplace requirements. Clusters can help focus career exploration activities of students. For faculty and institutional managers, clusters are tools for use in the development coherent programs of study within a single institution and across institutional levels. For state government clusters can be tools used by several agencies to promote coordination of their work.

In an economy as complex and dynamic as the United States' there is no perfect occupational and industry clustering approach. Grey areas will exist. The exact clustering schema is probably of less importance than having one and using it to help organize standards based programs of study based upon the five distinct types of standards.

Information from the states show the mix of clusters and the use of them varies widely. Also there are indications that clusters tentatively identified by the NSSB are being treated with a "wait and see" attitude by educators. They want to know if industry will embrace the economic sectors

as their own. The short term implications of this lack of coherence across state lines regarding occupation clusters is that it can seriously hamper the development of portable credentials called for in the STWOA and National Skill Standards Act.

The term career major is one that should be dropped. In hindsight a substantial miscue occurred in some of the STWOA wording. Specifically the clause that states a career major is to "prepare a student for a first job" can, at best, be viewed as a misnomer. In this country a distinct youth labor market exists and a high proportion of youth are employed in these high turnover positions, mostly in the retail and food services sectors. While there are many long term career opportunities in these industries, any clustering schema should never be based only on a first job strategy. The term career major itself has proven to be problematic conjuring up the image that high school students would be expected to make decisions too early in life. The term occupational/industrial cluster provides a better image of what needs to considered by states and others for a wide range of purposes.

Integrating Curriculum

There are growing and positive efforts to integrate academic and occupation related curricula. However, there are some serious problematic undercurrents impeding integration. These include, at least the following.

- ✓ The "academics only" focus of many school reform efforts. This observation is not meant to denigrate the importance of academics, to the contrary. Yet a "crowding out" effect occurs if states graduation requirements do not encourage integration of workplace basics including the needed personal attributes, career exploration and occupation related learning within the course work.
- ✓ The lack of clear state strategies regarding how to use career clusters as a cornerstone to develop programs of study that move progressively forward from the K-12 system into the post-secondary and/or workbased learning opportunities such as apprenticeship.
- ✓ The lack of a framework to present information about potential career pathways for individuals based upon a standards driven system.
- ✓ The lack of information regrading career progression potential within most occupational standards currently used in the U.S.

The last two points, the lack of a framework and information regarding career progression information that shows the escalating knowledge requirements normally attained through formal education, has lead to some serious problems. It is hindering the full potential of integrating the occupational skill standards within the overall curriculum frameworks established by the states. They are also hurting students: 1) it is difficult for them to grasp the full implications of why a standards based education matters for them; 2) it limits their visions of opportunities; and, 3) it impedes their understanding of what it is going to take to get to the "top" if that is their aspiration.

Foundation Skills

Just exactly what is meant by the term integration of standards driven curriculum is still in the stage of development but it is possible to assert that priorities can be established for specific types of skills being addressed as early as possible in the schooling process. The academic and workplace readiness skills need to be acquired long before high school graduation dates. The states promoting mastery proof prior to the last two years of free public education schooling are on the right track.

The 22 skill standards pilot projects were asked to focus part of their work on the skill requirements in high performance workplaces. Gaining agreement within the industry group regarding what constituted a high performance work organization was not always possible. Some found the characteristics of high performance workplaces can be identified within the sector but that few, if any firms, were practicing all of the identified characteristics of a high performance workplace. Even with these types of identification challenges, it is possible to report a key general finding. The type of skills that are most likely to be required in high performance workplaces than others are: personal attributes, interpersonal skills, thinking, problem-solving, communications, basic academics, and an understanding of the use of technology -- the generic workplace readiness skills. All projects found the need for these skills to one degree or another but, as noted, more so, in high performance workplaces.

Such findings support the work of other research such as the Secretary's Commission of the Skills of the American Workforce (SCANS). Additionally state after state's efforts to identify workplace requirements from their own employers affirm these findings. In the face of all these affirmations of the need for such skills, the education enterprise needs to explicitly incorporate such skills and knowledge throughout the learning process.

Integrating Industry and Occupation Standards into Curriculum

The academics and the general workplace basics standards are the foundations. However -- and it is an important however -- individuals with occupation and industry knowledge are the more sought after employees and they earn more. While some employers may say "we will teach them the specifics" they are normally referencing machine specific or site specific processes. They are not referencing the type of skills under the industry and occupation family skill categories. Much of the underlying knowledge about industries and occupations needs to gained in a structured education program. And employer organizations need to help frame that portion of the curriculum.

A cause for celebration exists in that so many work-related materials are being made available for use in improved curriculum and instructional materials. The growing research and knowledge base regarding how individuals learn strongly supports the inclusion of contextual learning opportunities into the instructional methods used in all classrooms (including second chance programs). Industry and occupational standards have potency as instructional materials throughout any curriculum.

Regardless of the some groups' rhetoric that fear insertion of career clusters and industry standards into school curricula, no one has argued that occupational or standards should, alone, drive all curricula. Such rhetoric defies history, curricula from high schools through Ph.D. programs in the professions, have long been users of occupational standards. Indeed, the professional schools (such as medicine, engineering, law, accounting, social work, the arts, and teaching) provide important models for integrating work-based requirements into curriculum.

Building a Support System

One of the lessons that can be gleaned from other countries who have had more experience than the U.S. in the development of standards based curriculum is that identifiable mechanisms need to exist that help translate the work requirements into useful material for the education enterprise (IEL,1993). Since that study, two other countries have developed stronger ties with the education policy making bodies (Britain and Australia) In the U.S. there are some efforts that can be used to build support systems that connect industry and education policy making bodies together to help integrate standards based materials into curriculum and instruction materials.

Assessment

Assessment and testing are fundamental to any conception of a national standards program. Assessment and testing are the core tools to recognize the competencies of individuals and to promote improved hiring and placement practices. Assessments also are key career planning tools for individuals. Information derived from assessments can help determine the effectiveness of education and training programs.

Although assessment programs are prolific, what is sorely lacking are the connecting links between and among the component parts of the workforce preparation industry. An "ideal model" for a certification system that begins at the middle school level with general career awareness training and moves up to occupation specific is provided in the full report. A key feature of this model is the relationship of the categories of standards described earlier -- core academic, generic workplace, and industry specific core, occupational family, and occupational-specific -- required for success in any given job or career.

Many would consider employer community an obvious candidate to turn to for possible support in the financing of new forms of workplace related assessment. Employers have often indicated interest in skill standards credentials for the very purpose of reducing the cost of recruitment. However, experience from the 22 pilot projects provides mixed messages regarding assessments. Acceptance of certification as an ultimate outcome received mixed reviews from industry primarily due to fears the certification would become mandatory due to government involvement. However, the projects that have gained consensus to support credentials have been those that have centered attention on specialty or occupation specific skills.

This generates a substantial dilemma, in that it is not probable that states and local education and training institutions can reasonably expect to shift the cost of work related assessments to the

private sector. It is clear many employers bear a substantial financial burden in the testing of workers. Numerous examples exist where hundreds or even thousands of applicants must be tested in order for even a few applicants to pass a screening test. These tests have a direct correlation to the job specific requirements of their workplace and cannot easily be substituted without assurances that an adequate broad-based validation study has occurred.

By using the ideal model as a starting point it is possible to address some key financing issues in a manageable way. For example, assume that assessments for workplace basic skills should not be developed by each individual school district nor by each state. Also assume the cost for each NSSB recognized voluntary partnership to validate these cross-sectors skills, which do not change as rapidly as specific technical skills, would be beyond the partnership's means (both technically and fiscally) and perhaps even interest. Then other more cost efficient ways must be found to develop assessment tools for the workplace basics skills. The natural federal agency to take the lead in supporting such an effort would be the Department of Labor.

Through collaboration of several stakeholders it may be possible to "unbundle" the assessment components (i.e. academic, workplace basics, and specialties) in ways that can make sense. A beginning point may well be bringing organizations together to develop some common strategies.

Program Approval or Accreditation Processes

Just as there cannot be national voluntary skill standards system without portable credentials based on the third party assessment -- some believe that without program standards you will never have people qualified to pass the tests -- whatever form they may take. This view is supported by a long history of industry associations and professional societies seeking better qualified graduates. Program standards are a natural by-product of skill standards. How they are used and by whom needs to be carefully considered.

Proliferation of program accreditation organizations, in whatever form, even if based on internationally recognized systems will meet resistance by many education policy making bodies. What is needed is a clear message from industry about the importance of the program standards.

Staff and Leadership Development Issues

The need for staff and leadership development cannot be overstated. The evidence abounds that without such support a standards driven system will not become part of the complex technologies of teaching or useful in providing information to assist policy making within the education enterprise.

The topics that need to be addressed include several "hot button" issues. Standards and assessments often conjure very negative responses on the part of teachers and school administrators. Anti-federal and state control flags are waved. Emotions run high within some minority communities that standards and assessments are just another way to discriminate. Animosities between academic and vocational educators arise. Reform weary educators believe

another fad is upon them. Already noted is the concern of some vocal conservative groups that standards are mind control of children. Turf issues between agencies arise. The list can go on.

A strategic effort could begin at both the state and federal level by asking what is being done in all currently funded leadership and staff development efforts to promote:

- ✓ the use of standards across all levels of the education enterprise (K-12, post-secondary, and training);
- ✓ the integration of academic and occupational standards (where appropriate);
- ✓ the use of occupational/career clusters as tools for organizing workforce development services;
- ✓ the use of occupational/career clusters as tools for organizing competency-based curriculum development;
- ✓ the use of standards to promote development of programs of study that cross institutional boundaries;
- ✓ the use of assessments in classroom and beyond; and,
- ✓ the use of standards and assessments within the employer community.

Information Systems and Services

An integrated academic and occupational standards-driven system is an information-driven system, even at the most rudimentary level. For a national voluntary system to be nurtured, a substantial amount of attention needs to be given to the development of an information infrastructure that can grow, be easily accessed, and have multiple uses.

With forethought, and by using technical working teams drawn from a variety of federal organizations and states, much can be done to assist in bringing on-line information about both academic and occupational skills standards that are accessible to all. Relational data bases can be constructed that would be able to identify common skill requirements across a wide range of economic sector, data bases that correlate academic and occupational standards can become common place. This is possible to do. It can, as well, save taxpayers substantial monies.

The capacity exists; the will to make it happen may not be. The common definition issues, can be a stumbling block. A "thousand flowers blooming" approach for describing standards would seriously hamper any such effort. This means that those involved in setting the framework for a skill standards system need to establish some basic operating groundrules regarding what goes into common data bases. It may well mean that O*NET (the replacement for the outdated Dictionary of Occupational Titles) developers will need to change some of their working definitions. States will need to agree to follow some common design rules as systems are established. In other words collaboration will not come easily unless all the stakeholders understand the value added purpose. Noble reasons can be made; such as by doing so standards have greater chance of becoming household words and will be discussed at the dinner table and on the news. There is a less noble reason and perhaps more practical. There is not enough

money for any of the key stakeholder groups to go it alone.

National and State Leadership Responsibilities

Lessons from the pilot projects suggests that as national voluntary partnerships are formed by NSSB the education and training providers selected need to cover the apprenticeship training organizations, representatives of industry sponsored colleges and universities as well as representatives of public institutions. These educators should be asked to help design an infusion strategy that would tap the existing networks (e.g., the array of state consortia, vocational student organizations, curriculum developers, academic standards groups, etc.) of education organizations that will need the material.

Skill standards partnerships may find it advantageous to establish a companion organization or at least an informal network that could assist them with an array of important but technical tasks of preparing education centered materials. This could include the identification of common core academic and concentration curriculum and instructional materials that would promote integrated learning opportunities.

Type of Standards Endorsed

There are several poor timing problems. The development of a standards driven education system has been neither linear nor always logical. The legislative time clock is part of the equation; the NSSB legislation must be renewed in 1999 and STWOA sunsets in the year 2001. To date no national standards have been endorsed by the NSSB and no across states portable credentials have been developed under the auspices of the STWOA. Meanwhile states are continuing to move forward in the development of their own state based standards systems.

The current NSSB plans call for the Board to only endorse core and concentration standards within an economic sector. Their recognized voluntary partnership organizations would then be responsible for endorsing the specialty credentials. These plans may be modified as experience is gained but as of this writing this is the planned approach. A better approach would be to recognize specialty standards on an interim basis. The criteria for endorsing such standards could clearly indicate the temporary nature of endorsements. This approach does not ignore the need for focusing on academic and generic workplace basic standards. To the contrary, these must become a part of all education programs. This is beginning to become more commonplace and the NSSB should work in concert with federal agencies and state to encourage expansion of such efforts.

There are several reasons for developing interim criteria to recognize specialty standards. First, it makes sense to build upon what exists and there are several quality programs and organizations that need to become a part of the national voluntary standards system. Second, many of them will be updating standards in the near term and with NSSB "interim criteria" could help guide such work. Third, it can build a stronger knowledge base regarding effective practices. Fourth, it can expand the involvement of the education enterprise's by helping to develop tools to aid in

the development of programs of study and contextual learning materials. Finally, there is much to be gained from continuing to draw upon the already made substantial public and private investments.

The federal agencies could work with the organizations involved in providing specialty credentials in a variety of ways. Those interested in developing better career pathway information for career guidance and job placement services could work with an array of standards based groups to incorporate the current information into their materials. By working through a variety of the state and local consortia organizations the federal government could help promote standards based programs of study guidelines. (This could include organizations not involved with just the three economic sectors targeted for establishment of Partnerships).

State Leadership Role

Though not required in the federal legislation a special connection is needed between the states and NSSB efforts. Our nation's size, diversity, and form of governance dictates the NSSB will not be successful unless there is a set of mechanisms established between the work of the national voluntary partnership bodies and the vast network of education and training providers throughout the country Also, the national effort will be fraught with frustration unless the key education policy making bodies in the nation become a part of the national network to develop and use skill standards as a part of the mortar in the workforce development system. These realities lead to the door of state government; this tier of government is the only level positioned to provide the "walking legs" to make the NSSB vision become alive.

A single point of contact organization in a state (ala a skill standards board or panel) can do much to achieve coherence in promotion of a standards driven education system. Many states already have established an organization that includes several stakeholders groups to help guide the development and implementation of academic standards. There is a need to develop a counterpart organization which has similar but different functions to help implement the occupational portion of the standards system. Essential tasks of such a panel would include the establishing priorities within occupational/industry sectors, reviewing available standards from national and other state sources, working with other states and national organizations in occupations where no standards exist for a high priority industry, establishing processes to review curriculum, marketing, and establishing an assessment system for use in schools and by industry. The assessment component should be geared to promoting portable credentials across state lines.

Business Leadership Challenges

It is not possible to ignore the central role and influence industry must play to assure any hope of success to promote a standards driven education system. Some national industry leaders have centered their attention on improving the academic standards. This is understandable from their individual perspectives as each is a busy CEO of some of the largest corporations in the world. They can only do so much. But it cannot be the whole story. While business leaders may want to send a common and clear message to education policy makers that a standards driven education

system is essential the fact is the message is still murky. The message is not yet coming through "standards language."

There are many employers who have devoted substantial time and attention to the development of skill standards. Evidence suggests many have become "true believers" of the value of the standards. Many have found the standards to be important tools to communicate their needs to their education suppliers. These employers did not stop with "just academics," they centered attention on the full range of knowledge and skill requirements. Perhaps a mini-summit is in order. Business representatives need to come together to address the different voices in the business community. Perhaps using the same standards language would help build that bridge.

National not Federal Solutions Needed

All of the recommendations in this report are predicated upon the concept of the need to develop a national collaborative strategy between the public and private sectors to build the necessary infrastructure. Such an approach is in keeping with our nation's traditions. Exhibit I, provides a road map for action by key stakeholder groups that must be involved in the fulfillment of the vision to make our education enterprise standards driven.

The statements identifies where responsibility lies for the recommendation. When the federal government is listed it is assumed that the Office of Vocational and Adult Education (OVAE) would take the lead to explore the feasibility of the recommendations with other parts of the federal government, unless another agency is explicitly identified. The recommendations related to the work of the NSSB address select issues that are singularly within their domain as well as many where they are one collaborator. NSSB has neither the resources or scope of authority to accomplish all of the task necessary to build the national infrastructure. Therefore partnering will be essential.

Due to the wide variations of states governance structures to meet the functions discussed in this report, the recommendations do not identify who in the state governance should assume the lead responsibility to address these recommendations. Clearly a logical starting point would be the organizations involved in the School-to-Work initiative and vocational preparation programs.

EXHIBIT I

Recommendation for Key Stakeholder Groups to Build a National Infrastructure to Support a Standards Driven Education Enterprise

Federal Facilitating Support -- Working with State Networks

There are an array of state based consortia organizations recognized in the paper that should be engaged in the following efforts. The work of NSSB should inform these efforts.

1. Develop common glossary of standards related terms to be used by the education enterprise.
2. Support the expansion of current consortia and networks to promote the development of integrated (academic and occupational) standards based materials into curriculum frameworks and instructional materials with particular emphasis on workplace readiness skills for the K-12 system.
3. Promote standards driven staff development efforts that cross agency lines including the development of materials targeted to different stakeholder groups and develop a dissemination strategy for the materials. The federal and state government will need to reach into array of networks, including the second chance programs to promote staff development opportunities.
4. Infuse standards requirements into career guidance materials, placing special emphasis on working with employer networks to develop materials to promote an understanding of career pathways.
5. Enhance the collection on information collected by federal government (e.g., National Center for Education Statistics) to document the use of occupational standards material in the education system.

Promoting the Development of Voluntary Skill Standards System

NSSB when establishing criteria for Voluntary Partnerships should:

1. Recognize lead role education and training provider representatives have to assist in the design and development of education and training related products and services, derived from the industry identified standards.
2. Develop a roadmap that will help education enterprise understand the equivalencies between the requirements of the workplace and the needed levels of education, such as exists in Australia.
3. Use International Standards Organization (ISO) processes as a guide to establish program quality assurance standards.
4. Consider developing interim criteria to recognize existing standards until further work can be incorporated by emerging voluntary partnerships.

NSSB as a Collaborating Partner should:

1. Identify and work with education networks to develop materials for program on studies based upon current skill standards.
2. Develop support materials, in concert with the National Occupational Information Coordinating Council (NOICC), for education providers by cross-walking the 16 economic sectors with education program information for the purpose of developing programs of study.
3. Sponsor, in concert with the Department of Labor, multi-year cross sector validation of core academic and workplace readiness skills for use by all voluntary partnerships, O*NET, and workforce development education and training providers.
4. Develop, in concert with Department's of Labor and Education, processes to promote the development of nationally recognized assessment tools to assess workplace readiness skills.
5. Convene an assessment technical support group composed of federal agencies, federally funded assessment research and technical assistance providers and state based organizations representing the agencies responsible for education assessment to focus on the technical issues required to make an assessment system that promotes portable credentials become reality.
6. Design a framework, with Department's of Labor and Education, that will promote the use of relational data bases that incorporates skill requirements information for use by all national and state standards setting bodies and public and private users.

State Responsibilities

States should:

1. Incorporate generic workplace skills and contextual learning materials based on nationally validated standards into curriculum frameworks.
2. Ensure that approval of institutions program of study include standards driven criteria for both secondary and post-secondary institutions.
3. Establish a "single point of contact" panel for skill standards development. The panel should build its work to meet the needs of all workforce preparation programs in the state.
4. Elect industry/occupational clusters (making every attempt to have these clusters fit into NSSB) national framework that can be used to:
   a. develop curriculum frameworks for use in programs of study with particular attention given to industry/occupational core skills;
   b. develop articulation agreements between different levels of education institutions;
   c. develop career pathway information services based upon the clusters for use by all workforce development organizations and most specifically for career counseling services.

Business Community Leadership

1. Hold a mini-summit in order to clarify messages to the education and training providers about the utility of both types of standards for the workplace.

STANDARDS: MAKING THEM USEFUL AND WORKABLE FOR THE EDUCATION ENTERPRISE

....civilization is a sequence of new tasks
(author unknown)

PURPOSE

This white paper focuses on "taking stock" of how standards, most specifically skill standards, are being used within the education enterprise and the ways they could be used more efficiently and effectively. It builds upon lessons learned over the past five years from 22 national pilot projects charged with the development of skill standards. Lessons are drawn from states' efforts to build standards into education reform efforts, with a special emphasis on the systemic change efforts promulgated under the School-To-Work Opportunities Act (STWOA) of 1994. To some extent, states' lessons in developing more connected workforce development systems are appraised. The beginning efforts of the National Skill Standards Board (NSSB) are considered and the roles of various federal and state agencies are explored. The purpose is to look to the future.

The paper probes specific standards-related issues and their relationship to the education enterprise:

- ✓ Use of occupational/industrial clusters;
- ✓ Development of an integrated academic and occupational curriculum based on both types of standards;
- ✓ Development of assessment strategies to eventually establish highly respected portable credentials by both industry and education institutions;
- ✓ Implications for program approval or accreditation processes;
- ✓ Implications for leadership and staff development efforts;
- ✓ Spreading the word about the value of standards to the consumers (e.g., students, counselors, curriculum developers, teachers); and,
- ✓ National and state leadership responsibilities.

A brief summary of the findings from a baseline study of five years ago that documented the state of both education and industry driven skill standards in the United States and other countries frame the process for taking stock. These are:

- ✓ Few skill standards systems included levels that can assist an individual in moving from novice to master in his or her preferred occupation.
- ✓ In some of our most important competitive sectors, little or no work had been undertaken to develop nationwide skill standards.
- ✓ A crazy quilt pattern of financing the components of the system existed, raising questions about both the cost efficiency and effectiveness of the system.

- ✓ The infrastructure has not adequately supported the development and upgrading of an important component of a high quality skill standards system -- the instructors.
- ✓ No common agreement existed about what to include in definitions of an industry or an occupational cluster, leading to confusion across the varied skill standards efforts.
- ✓ No common framework or language existed between the industry and education enterprise, or among the general public.
- ✓ Few credentialing programs are targeted at the entry-level workforce (IEL, 1993).

That was then; progress has been made, but much work remains.

PREAMBLE

An array of pubic and private sector forces keeps the issue of developing a standards driven education system on the national agenda. Yet, the means to knit the pieces together remain illusive. Most public press and national rhetoric continue to center on the need to upgrade the core academic standards. The highly publicized 1996 National Education Summit, a collaborative effort of some business leaders and the nations' governors, reaffirmed commitments to national education goals. The governors pledged, again, to establish state academic standards. The business leaders who participated pledged to do several things, among them to clearly communicate to students, parents, schools, and the community, the types and levels of skills necessary to meet the workforce needs of the next century and to carry out hiring practices within one year that will require applicants to show academic achievement. The National Governors' Association and these same business leaders are establishing a new organization called Achieve to track, monitor, and benchmark the states' effort, and presumably, that of the business community to fulfill their commitments.

To date, there is little indication that the business leaders involved are strong advocates for the development of a national voluntary skill standards system. This raises a series of questions, not the least of which is, how do the business leaders plan to communicate the types and levels of skills necessary to compete in the next century? One by one? Community by community? State by state? This lack of a clear and agreed upon strategy to find ways to interlock the development of academic and occupational skill standards is not a new dilemma.

We are in a period of substantial exploration and change as the nation seeks to move forward and infuse standards into the education system. Such change is neither linear nor always logical. The 1989 National Education Summit between then President Bush and the nation's governors first spurred the support for core academic standards. The publication of national standards has been going on for almost eight years. Some organizations received support from the federal government to develop standards, others did not. The mathematic standards were the first to be released in 1989 and others are still being released, with economic standards issued within the past few months. Occupational standards, whose development has been

supported by the federal have been issued over the last three years and these standards become a part of the mix of standards that have long been available. States have had the tasks of searching and sorting through all of these sources to develop their own materials.

Many states have found that gaining consensus about the content of academic standards is a process that must be iterative and inclusive. Such processes can be frustrating for parents, elected officials, and businesses. The process can be threatening to school governing bodies and educators if not handled with great care. Continuous improvement strategies must be a part of the process. Few, if any first drafts of standards written at the beginning of this decade can probably be found in state materials today.

President Clinton has shown unwavering support for a standards' based education system. His call for national exit examinations of students in reading and math at the fourth and eighth grades suggests an appreciation for how difficult it will be to alter the practices within our far-flung education enterprise. This is a modest approach compared to our international competitors who have high stakes exit exams for students throughout the education and training process, most of which are managed by the central government. Yet, most of the U.S., for a variety of reasons, has eschewed exit exams as a part of the awarding of diplomas.

A careful study of the National Education Goals reveals that occupation-specific standards were not explicitly part of the goals. However, Goal 6, the Adult Literacy and Lifelong Learning Goal, provided the impetus for the launching of a voluntary skill standards system. The Employment and Training Administration of the Department of Labor (DOL) in concert with the Office of Vocational and Adult Education (OVAE) of the Department of Education (DofEd) lead this endeavor.

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 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.

These two objectives will not be realized by the year 2000, yet, compared to 1990, progress is occurring throughout many businesses and communities. However, there is no systematic effort underway to capture the range of what is going on to meet these objectives. The National Education Goals Panel (NGP), charged with tracking the progress of the education goals, lacks the resources to do so. The NGP publishes an annual report on the progress of

all of the goals, however there are several areas where information is not available to track progress. These two objectives fall within that category. Even if the NGP had more resources, the technical challenges of collecting the information would be substantial.

A desirable development emanating from these national leadership forums and the work of others is that the necessary connective tissue can be attached to a national voluntary standards skeleton that includes both academic and occupational standards. At certain points in the learning process, the two types of standards must become connected.

A gap was generated when Congress chose not to fund that portion of the Goals 2000: Educate America Act of 1994 that established a National Education Standards and Improvement Council (NESIC). This occurred for a variety of reasons, but mostly because of the concern that the proposed responsibilities of the Council would generate too much federal intrusion into the public education system. The creation of the NESIC had been one of the most controversial parts of the original legislation and the final version coming out of Congress was not supported by the Clinton Administration nor by key organizations representing state and local education governing bodies. This controversy aside, at least NESIC required coordination to occur between the development of occupational skill standards and the development of content and performance standards for core academic areas such as mathematics, science, English, and foreign language.

Today there is only a modest effort being undertaken to promote correlation. The National School-to-Work (STW) office along with the NSSB and OVAE are supporting three pilot projects to mesh the standards where appropriate. Also the National Center on Research on Vocational Education (NCRVE) is being supported to study and promote work in this area. However, these modest efforts need a broader base of support, particularly from organizations concerned about core academic standards.

A central feature of the National Skill Standards Act of 1994 is that a range of interested parties must be involved in the development and implementation of a voluntary skill standards system. The Act appropriately gives the lead responsibility to the private sector to identify the priority occupations for which standards will be developed with the intent that employers will be primary consumers of the standards for hiring and promoting their workers. However, the Act recognizes that employers are dependent on the efforts of others. This paper is about one of those stakeholder groups -- the education enterprise. The legislation assumes the education enterprise shall simultaneously be:

- ✓ a conduit to spread standards to students and institutions alike;
- ✓ a user of the standards to develop curriculum and instructional materials;
- ✓ a generator of portable skill certificates; and,
- ✓ evaluated, in part, based upon the standards.

The Act goes on to note the need for standards to be especially linked to particular portions of the education enterprise (school-to-work, secondary and postsecondary, vocational-technical education, and job training programs).

The Act provides for representation from the education enterprise in the decision-making processes, on the national board, and on the voluntary partnership bodies. Technically, only one NSSB member must represent all of the education enterprise; though by professional affiliations seven of the 24 members come from the ranks of the education enterprise. Membership is also required on the voluntary partnership bodies (the groups that will establish the actual standards) yet again, technically only one member of each group must be drawn from the ranks the education enterprise; however, the minimal number is not likely to become the maximum.

The small number requirement of education representatives reflects a substantive dilemma that the legislative framers confronted. First, and appropriately, pertains to the desire to have the NSSB driven by the needs of industry and representatives of employees. Thus, eight members of the board are industry representatives and eight are drawn from the ranks of unions. Given this weight factor and the need to keep the size of the Board manageable, the additional eight seats were spread among other stakeholders. The framers also faced the question of who from the education enterprise needed to be "at the table." The number of possibilities is large; K-12 general governance representatives, postsecondary, certain parts of the complex postsecondary system (two and four year institutions, proprietary and business sponsored organizations), and the vocational education community, etc. In other words, there was no easy answer and the framers settled for one representative within the "other category" of board representatives. This means that other forms of connecting with the wide ranging education and training community must be found.

Explicit criteria in the STWOA drives home the need for state and publicly funded education institutions to adapt and adopt nationally validated skill standards for multiple purposes; such as, development of integrated curriculum, constructing career pathways information systems, engaging the private sector in STW efforts, and issuing certificates of competencies. The STWOA references to industry standards build upon prior efforts to improve the linkages between the workplace and the schoolplace.

The Carl D. Perkins Vocational and Applied Technology Act, commonly called Perkins II, required each state to establish at least two technical committees to establish industry endorsed skill standards. The Institute for Educational Leadership's baseline study, referenced earlier, found that approximately 700 committees, using industry volunteers, exist across the country and assist states in developing skill standards, many of which had been established prior to the passage of Perkins II. Their explosive growth shows the responsiveness of education policy-makers to industry needs (IEL,1993). The study also found that a substantial portion of the education driven skill standards are developed as part of state consortia of member states regularly sharing the work and keeping costs down. However, no one set of skill standards

was used by every state. In 1992, only 26 to 32 states used a common set of standards for any one occupation.

Lessons from the Research and Development Period

Rich lesson exists due to funding in the past five years of 22 national skill standards pilot projects by the U.S. Departments of Labor (6) and Education (16). An array of organizations were given lead responsibility to organize stakeholder groups to help determine the potential of developing a national voluntary skill standards system. The projects received general guidelines regarding their responsibilities but few prescriptions were attached to their grants regarding how standards were to be developed. Each project was to identify not only occupation specific skills, but also basic academic knowledge and skills and workplace basic skills. They were charged with validating skill requirements through procedures in compliance with civil rights laws. Also each project was to develop a sustainability strategy for the project to continue after the federal funds were withdrawn. (See Attachment A).

The types of organizations varied as well as the scope of the industry/occupation on which they focused their work. Five were sponsored by a single industry trade association, six by consortia of trade associations, four by applied research and development organizations with strong ties to the education enterprise, two by consortia of state and student organizations, two by registered apprenticeship bodies, and two by professional societies (IEL, 1996).

Within the 22 projects, organizations that had some longstanding interest and involvement in standards for the workplace also focused on developing or enhancing program standards for program accreditation purposes. These organizations include the National Automotive Technicians Education Foundation (NATEF), the American Chemical Society (ACS), and the American Welding Society (AWS). Organizations with close ties to or operators of apprenticeship programs also have used the standards to upgrade their program standards. These include the National Institute for Metalworking Standards (NIMS), the Laborers-Associated General Contractors, and the National Electrical Contractors Association. Organizations involved in the Human Services Consortium are also using the standards to modify accreditation materials.

Several organizations with deep roots in the education enterprise placed most of their emphasis on the development of products that could be used by educators. This was less true of the organizations that had stronger roots within industry trade associations. One organization, the Industrial Launders, recognized from the outset that it would be highly unlikely any public education institution would become involved in the training of workers for their industry. They, therefore, constructed their whole project based on the assumption that all training of the workers, based upon the standards, would take place within the workplace. All other projects presumed that standards would be of use to institutions within the publicly funded education and training enterprise.

Twelve projects developed standards for entry level workers only, the others centered attention on entry-level to mid-level or mastery-level technicians. Some developed "synthesis standards," specifically for the purposes of identifying training-related materials. This form of standards does not lend itself readily to use in a formal national credentialing service, but has substantial utility for educators as instructional tools and assessments of students. For example, the Bioscience project, managed by the Education Development Center (EDC), developed "training standards" presented as scenarios. They based their material on an amalgamation of skill and knowledge requirements across several jobs and industries. They were particularly concerned from the outset in the development of materials that would be useful in classroom instruction. The Center for Occupational Research and Development (CORD) also developed synthesis standards for emerging occupations in photonics and hazardous material management. One of the two National Coalition for Advanced Manufacturing (NACFAM) projects differed slightly by developing standards around a particular "skill set" for computer-aided drafting and design required in multiple occupations across several industries. NACFAM's other project, manufacturing technicians standards, was built upon a skill set model but with a single sector focus. The other projects centered their attention on specific occupations/jobs. Ten sets of the standards developed cross over two or more of the economic sectors selected by the NSSB.

There are some general observations to be made regarding the relationship among the 22 projects and the education enterprise to date. These include:

- ✓ Representatives of the education enterprise, most specifically those involved in vocational training work, have been the heaviest consumers of information about skill standards.
- ✓ There have been concerns arising from several state representatives about the lack of consistent approaches used by the national projects in the presentation of materials.
- ✓ Few states or individual institutions are adopting the skill standards as published to be a part of their curriculum frameworks, modifications are being made.
- ✓ National standards are being reviewed by local employers in the same industry. In some cases this is an explicit strategy of the sponsoring national organization to adapt to specialties within the sector. For others, the practice is being discouraged.
- ✓ The small staffs of organizations responsible for the pilots do not have the capacity or means to respond to requests from the education enterprise and are concerned about how to find more effective and efficient ways to work with the education providers.

The Education Industry

The education industry employs approximately 8 percent of the total labor force, or about 10 to 11 million workers. Of that number, 3.1 million are employed by the 14,770 public school

districts, of which 6.5 percent are in vocational education. They all need to know about and be able to use standards-related material. There are 3,600 plus two year colleges and the 2,215 four year plus institutions where occupation specific education is provided. (U.S. Department of Education,1996). An estimate of the firm-sponsored education colleges and universities currently stands at 1,700. No official count of second-chance training organizations (e.g., Job Training Partnership funded programs, welfare-to-work, adult education etc.) exists but they also need to become users of standards related material. Also no official count exists for industry, trade, and professional associations who often provide training for which continuing education credits are awarded. Formal apprenticeship programs often employ their own instructors. Independent contractors work throughout these various milieus.

For individual educators, the direct relevancy of the skill standards will vary but all should be aware of both academic and skill standards, have easy access to information about them, and be able to understand the connection to their own work. In order for this to occur resources will need to be directed toward this end. This has major staff development implications as well as how to build networks with national skill standards partnership bodies that are discussed later.

This paper will focus predominantly on the publicly-funded education and training parts (including the second chance programs) of this large enterprise because this is where the stakes are the highest for the nation as a whole. However, the expertise of individuals engaged in industry-sponsored training (e.g., apprenticeship, association and company specific) needs to be tapped in several different ways to create the connective tissue between the various parts of the enterprise.

Definitions

The word standards has many uses and different meanings within the education enterprise. Clarity about the meaning and use is essential. A core task of the NSSB is to establish a common nomenclature. As of this writing, this task has not yet been tackled, though some work has begun. Therefore, it will be necessary to establish some definitions for use in this paper. Many of the following terms were first codified by Ananda and Rabinowitz (1995) in a paper developed for IEL. These definitions were developed after an extensive review of literature as well as information gleaned from the 22 national skill standards pilot projects.

Two basic types of standards cut across industry and academic circles.

- ✓ *Content standards* refer to what we expect learners to know and be able to perform.
- ✓ *Performance standards* indicate levels of achievement, or competency within a content area (e.g., advanced, proficient, and basic). Performance standards can be set either for an individual content standard or across groups of content standards.

There are several different types of skill standards one building upon the other: *core academic, generic workplace readiness, industry core, occupational family, and occupational or job specific.*

- ✓ *Core academic* standards cover those subject matter areas such as mathematics, language arts, and science that are necessary for functioning as a member of society and help develop career-related skills.
- ✓ *Generic workplace readiness* standards cover those skills and qualities that workers must have to learn and adapt to the demands of *any* job. These include personal attributes, interpersonal skills, thinking and problem-solving, communication, and use of technology. (SCANS,1991; CCSSO Workplace Readiness Assessment Consortium, 1993)
- ✓ *Industry core* standards apply to most of the occupations in a particular industry. Thus, there are core standards for the hospitality industry that are distinct from core standards for the electronics industry. Industry specific standards are critical to career-preparation programs (e.g., career majors and programs of study).
- ✓ *Occupational family* standards specify the knowledge and skills that are common to a related set of occupations or functions within an industry or across industries. For example, within the health care industry, occupations in medical laboratory, imaging, and radiography can be thought of as belonging to a larger diagnostic family (or cluster) of occupations. The occupations in this diagnostic family focus on creating a picture of patient health at a single point in time. Whereas individual job-specific requirements may change, depending on changes in the job market as well as changes in the structure of the workplace, occupational family level standards provide a broad base of skills for individuals.
- ✓ *Occupational or job specific standards* address the skill expectations of a specific occupation. This is the level at which many existing career-preparation programs and certification systems are focusing.

Definitions are never static; they take on new meanings with time and experience however, this does not lessen the need to have some common understanding of terms. There have been several examples of definition problems that have continued to plague the nascent standards movement over the past five years.

The reality is there is a search is underway for some common definitions to use in a standards-driven system. The following attempts to capture the essential ingredients of generally understood usage. Some of the definitions are specific wording developed by a particular organization, while others are a synthesis of one or more sources:

- ✓ *Content Standards* specify the content knowledge and skills all students will know and be able to do upon completing particular grades or courses in K-12 education; the content standards state clearly the knowledge and skills to be

learned, and at what developmental level content is to be presented. In some states, content standards are a separate state document; in others, they are published in a curriculum framework (CCSSO,1996).

- ✓ *Curriculum Alignment* links academic and vocational curricula so that course content and instruction dovetail across and/or within subject areas. Curriculum alignment may take two forms: horizontal alignment, when teachers within a specific grade level coordinate instruction across disciplines, and vertical alignment, when subjects are connected across grade levels, cumulatively, to build comprehensive, increasingly complex instructional programs (National School-to-Work Office,1996).
- ✓ *Curriculum Framework* is a document published by a state education agency or state board of education that generally includes desired subject content or standards for a core academic subject in K-12 education and is written by a team of content experts, state agency personnel, and local educators. A state framework often serves as a bridge between national profession standards and local curriculum and instructional strategies. It may address areas of pedagogy, classroom examples and vignettes, strategies toward equity, important education policies, and school conditions. The framework document may also refer educators to other materials and resources to support local efforts (CCSSO,1996).
- ✓ *Curriculum Standards* include industry validated knowledge, skills, and abilities that a student is expected to learn in a program of study or specific course. The materials contained in the standards can be a synthesis of task analyses derived from any of the five types of skill standards (core academic, generic workplace readiness, industry core, occupational family, and occupational (or job) specific).[1]
- ✓ *Integrated Curriculum Standards* integrates occupational/industry related material with academic standards that may or may not be validated at the worksite.[2]
- ✓ *Integrated Academic and Vocational Education Program* develops and delivers a curriculum based on three components: academic, technical, and personal qualities delivered in an applied, contextual manner (MERC,1997).
- ✓ *On-demand assessment*, are activities administered on specific dates under secure conditions (WestEd,1995).
- ✓ *Program Standards* are established by national trade, professional associations or certification organizations for the purpose of recognizing education or training institutions. The standards can include references to instructional

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[1]This definition is based on CCSSO, CORD, and WestED.

[2] A portion of this definition is based on work underway by the Center for Occupational Research and Development (CORD,1996).

services, facilities, qualification of staff, equipment, and administrative processes.

- ✓ *Portfolio* is a collection of evidence that shows important work undertaken by a student, in the case of career-related education it would include examples of career-technical and academic knowledge and skills learned by the student. It serves as a vehicle for organizing and presenting students' work for assessment purposes, as well as, to prospective employers or advanced training institutions (WestEd,1995).
- ✓ *Scenarios* are examples of issues and problems found in worksites and validated by industry representatives. The scenarios can be composites of several job specific situations. The scenarios can be used in a variety of ways by education and training providers such as becoming a part of the instructional process as well as being used with on-demand assessments.[3]

This listing is by no means complete nor official; however, it is an attempt to help clarify discussion that will follow and perhaps become useful for the standards movement, both the academic and occupational initiatives.

A Central Purpose

It is important to remember that standards have value beyond their use in the education enterprise. Their value will ultimately be determined in the workplace when employers use standards for hiring and promotion because productivity is enhanced. However, these are private purposes not "in the public good" category. The education enterprise needs a compelling argument that a skill standards driven system has a chance of generating a long term value for students and institutions while enhancing the public good. Standards cannot become just another education reform fad. They need to become ingrained into the daily work of teachers and students at all levels of the education enterprise. This is a large order task. The following quotation makes a clear argument about why long term value exists for occupational skill standards should be a part of the education system (secondary, postsecondary and second chance).

> The primary objective of any skill standards initiative should be to improve the content and instructional quality of education programs. Skill standards have been promoted as a way of motivating all students to learn by focusing their attention on the academic knowledge and skills they will need for success in the workplace, at home, and in their community. Beyond simply increasing the caliber of instruction, a skill standards system should help students select from a number of career and life pathways. Standards should introduce students to the range of educational options and careers available, and provide them with information on the type of academic and workforce

[3]This definition is derived from the work of WestEd and the Education Development Center (EDC).

preparation they will need to find employment in the industry and occupation of their choice. At their most specific, industry standards can help students gain the advanced skills they will need to find immediate employment in the occupation of their choice (MPR,1996).

This quotation provides a compelling argument for both policy makers and practitioners alike to all parts of the education enterprise to become major contributors to finding new ways of organizing institutions, instruction and assessment services for all students.

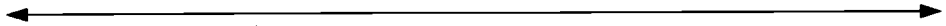
We will now turn our attention to specific issues that are being addressed, or need to be addressed, in order for the education enterprise to realize the potential of a standards-driven system.

OCCUPATIONAL CLUSTERS, CAREER MAJORS, and PROGRAMS OF STUDY

An important assumption is that some form of clustering of occupations and industries is a prerequisite for standards to become powerful tools in education reform and to strengthen the workforce development systems in our country. This assumption has taken many forms. For example; 1) the legislation required the first task of NSSB to establish broad occupational clusters for which skill standards will be developed; and, 2) states could not receive STW implementation grants without developing strategies to establish career majors/clusters and

FIGURE 1

SKILL STANDARD CONTINUUM
EXAMPLES FROM THE HEALTH INDUSTRY



General workforce preparation	Industry core skills and knowledge	Occupational cluster skills	Specific occupational skills
ALL WORKERS	HEALTH SERVICES	HEALTH INFORMATION SERVICE	HEALTH INFORMATION TECHNOLOGIES
Read, write, perform math operations; listen and speak	Be aware of the history of health care	Locate information in medical records	Evaluate medical records for completeness and accuracy
Apply basic and advanced academics in the work setting	Use health care terminology	Use computer programs to a process client information	Use a computer program to assign patients to a diagnosis-related group
Participate as a member of a team			

Source: MPR Associates 1995, School-to-Work Opportunities Glossary of Terms, Berkley:Author

programs of study. Clearly the writers of these "systemic change"pieces of legislation envisioned that gaining a common approach about how to organize industry and occupational clusters would go a long way to improve the current state of affairs.

The education enterprise, particularly those involved in the initial preparation of students, would have to be considered a major customer, if not the major customer of occupational clusters. They have been using some form of clustering for over a hundred years to help organize their work. At the postsecondary level, professional schools represent the most obvious example of usage. The National Center for Education Statistics has historically published facts about all educational institutions around clusters through the Classification of Instructional Programs (CIP).

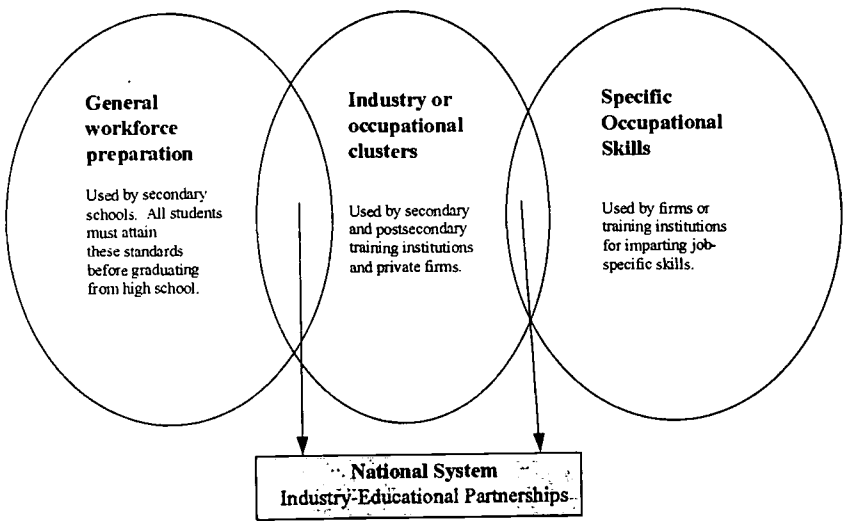
MPR (1996) points out that clustering schema which recognizes the range of standards contained in the definition section above, can help build the bridges between the needs of education institutions and the private needs of the workplace (See Figure 1).

MPR views the intersections among the three skill clusters (Figure 2) as helpful in designing clustering schema as well as organizing programs of study and instructional materials. This taxonomy can also help focus the work of national voluntary skill standard partnerships and their work with education institutions. This taxonomy presumes that students at a minimum exit high school with solid academic and general workforce preparation skills.

It must be recognized that a single source of information does not exist about potential career

FIGURE 2

SKILL STANDARDS TAXONOMY



Source: Rahn M.S., Klein and D. Emanuel 1994 in MPR, Skills Standards:Concepts and Practices in State and Local Education

pathways and the needed material for development of more coherent programs of study based upon the proposed industry and occupational family. It is too early in the process of developing a national voluntary system for anyone to make such a claim. But this does not mean the current industry and occupational standards information cannot inform the effort to develop programs of study with work-based and contextual learning experiences included within some occupational/industry clusters.

Research supports the value for following this path. Active student involvement in collaborative learning, internships, meaningful work-study brings student greater learning effectiveness and students learn more from a coherent and developmental sequence of courses (U.S. Department of Education, Office of Educational Research and Improvement, 1995).

Establishing Clusters

In an economy as complex and dynamic as the United States' there is no perfect occupational and industry clustering approach. Grey areas will exist. NSSB selected sixteen economic sectors at the end of 1996 after gathering information and several hearings. (See Attachment B). NSSB sought a balance between industrial sectors with which employers identify and occupations sectors about which educators and individuals must address -- thus the term and grouping of economic sectors emerged. These sectors are not set in concrete and may change as experience is gained. The number of partnerships per sector has not yet been decided. There may be only one for each sector. They plan to add sectors each year. The current plans are to begin work with three sectors in 1997: wholesale/retail sales; manufacturing/installation repair; and business and administrative services. Projections are that all 16 sectors would have recognized voluntary partnerships by the end of the century.

The education enterprise has different needs than those of industry when considering the utility of clustering. The significance of these differences are reflected in the work of the National Occupational Information Coordinating Committee (NOICC). It has responsibility for cross-walking information about the labor market and the education system. It drafted a set of broad clusters that group both occupations and educational programs (close to but not exactly the same as adopted by NSSB) . A unique feature of this effort to develop occupation/career clusters is that it has been based on a simultaneous consideration of occupations and educational programs and their interrelationships, rather than simply looking at one or the other separately. The salience of knowledge between and among the various occupations is captured in this clustering system. Rather than producing a single set of broad clusters, NOICC created a hierarchy of four levels:

1. The most detailed level is that of the some 700 occupations in the OES and over 1,000 programs from the CIP;
2. The next level groups the occupations and programs into 240 units of analysis;
3. At the next level of the hierarchy are 42 broad clusters;
4. At the broadest level there are 15 superclusters. (See Attachment C). (NOICC, 1995).

This classification schema has an obvious advantage in that it provides a road-map with utility for all education levels and training institutions. From such a road map it is possible to develop programs of study that move from the general to the specific. The relationship to industry clusters are implicit rather than explicit.

States Response to Career Majors

Career majors are considered a key organizing tool for the STW efforts and are being established by the states, albeit with mixed messages emerging. The legislative definition of career majors is: a coherent sequence of courses or field of study that prepares a student for a first job and among other things ensures that:

- ✓ integration occurs between academic and occupational learning, school-based and work-based learning,
- ✓ linkages are established between secondary schools and postsecondary institutions;
- ✓ students are prepared for employment in a broad occupational cluster or industry sector; and,
- ✓ students receive a skill certificate (STWOA).

The term skill certificate is defined as a portable, industry recognized credential issued by a state approved STW program. The legislation requires that state issued skill certificates should be at least as challenging as skill standards endorsed by the NSSB.

To establish career majors, some states choose occupational clusters long used by vocational educators. Other states have designated broad career major areas that are being used primarily at the secondary level but there is not yet substantial evidence that these broad areas have been adopted by the postsecondary education level in any meaningful way. Other states have designated industry-specific occupations as career majors, yet others have combined occupations and industry specific focus areas. (See Attachment D).

Within the K-12 public education system, the adoption of career majors as a core strategy for education reform has run into several stumbling blocks, some of which have become politically divisive. Several conservative national organizations view the idea of establishing career majors as potential negative "mind control" over students. For others, the terminology means promoting a tracking system that would eventually hurt students' ability to gain further education. For others, more familiar with the challenges of allowing some time in the high school years for occupation specific training, the cluster idea suggests a different type of problem. They look to a continuing decrease in occupation specific program participation at the high school level as a negative impact on students ability to find meaningful work (Border and Losh,1996).

MPR (1996) found, in a case study of four states, that as the states are building cluster based skill standards systems positive reverberations are taking place. It has generated allies within

the employer community, produced a commitment of resources from the private sector, injected a real-world perspective into the standards process, helped to establish state benchmarks of quality programs, and has begun to align curriculum and assessment of students' knowledge and skills learned.

However, MPR found that language matters as it relates to the definition of career majors/clusters. Sometimes it is minor difference in semantics but at other times the same terms mean radically different things. For example, MPR found that in one state the term cluster describes a group of related occupations within a specific industry, such as Secondary Wood Products (an important industry for them) that would correspond with a narrower industry/occupational cluster in other states. In other cases, standards are defined for a specific set of only entry-level occupations and do not yet address career ladder opportunities either within the occupation or within industries. The lack of a common framework for understanding the meaning and use of career majors/clusters is hindering progress. It makes it difficult to share best practices, impedes the development of coherent programs of study, contributes to the lack of an infrastructure for developing curriculum and instruction, and most to the integration of academic and occupational related curriculum.

A comparative review of the implementation plans of the ten states that have been awarded both STW and One-Stop implementation grants was undertaken. A key part of the analysis was assess how career majors/clusters were being used to promote systemic change. It is clear, that currently, the use of career clusters or occupational clusters has not yet matured to the point they are a significant link among the various parts of the workforce/economic development system. Clusters are not being used by labor market support system as a way to organize information services. There is no mention that any special link to training or information about clusters and career pathways will be made available to the customers of one-stop centers (Kaufmann and Wills,1996).

There is little evidence that the states will any time soon simply adopt the sixteen economic sectors recently identified by the NSSB. Conversations with state officials suggest they are taking a "wait and see" stance. Some are waiting for more detail about what is "inside" the proposed broad sectors. Some are waiting for the response from industry. As one seasoned observer, noted, educators respond to industry when there is a clear and consistent message coming from national and local employer leadership.

In hindsight, a substantial miscue occurred in some of the STWOA wording. Specifically the clause that states a career major is to "prepare a student for a first job" can, at best, be viewed as a misnomer. In this country a distinct youth labor market exists and a high proportion of youth are employed in these high turnover positions, mostly in the retail and food services sectors. While there are many long term career opportunities in these industries, any clustering schema should never be based only on a first job strategy. The term career major itself has proven to be problematic conjuring up the image that high school students would be expected to make decisions too early in life. The term occupational/industrial cluster provides a better image of what needs to considered by states for a wide range of purposes.

As noted earlier, the education enterprise has long used the tool of clustering for a variety of purposes. The renewed emphasis on clustering connected to standards can be considered as a "back to basics" strategy. It is simply a way to organize information about career pathways and educational and workplace requirements. Clusters can help focus career exploration activities of students. For faculty and institutional managers clusters are tools to use in the development coherent programs of study within a single institution and across institutional levels. For state government clusters can be tools used by several agencies to promote coordination of their work. The exact clustering schema is probably of less importance than having one. However, for the education enterprise the NOICC crosswalk work shows the value of providing sufficient detail for practitioners to envision the building blocks of clusters.

INTEGRATING CURRICULUM

Contained in the definition sections are terms for Curriculum Frameworks, Curriculum Alignment, Curriculum Standards, Integrated Curriculum Standards, and Integrated Academic and Vocational Education Programs. They are all interrelated but somewhat different. Each was included because no one concept currently captures the range of issues that members of education enterprise must consider when developing standards driven education curriculum and instructional materials.

Concepts that find their way into the definition section of legislation often launch a search for a common understanding of what the words mean. A current case in point is the term Tech-Prep, a highly popular program idea codified in Perkins II. Each state developed its own working definition with mixed degrees of effectiveness. Tech-Prep promotes integration of academic and occupational curriculum and the use of coherent sequences of courses across institutional boundaries. There is growing recognition that the lack of a common and workable definition used across all states has unfortunately hampered growth of Tech-Prep type efforts. Tech-Prep advocates are now calling for Congress to establish a common definition (U.S. Department of Education, 1996, AVA,1997). This is not an atypical cycle in terms of how our intergovernmental system operates.

The Metropolitan Education Research Consortium (MERC) in Richmond, Virginia, was asked by its seven school district members to assist them in the development of a systemic approach to integrate academic and vocational education. A solid review of the literature and practice led them to develop a framework because they found most education policy makers and practitioners were more than a little "fuzzy" regarding exactly what integrated curriculum meant. They also concluded this fuzziness was a major impediment to moving forward efforts to promote integration of curriculum. They developed a framework that includes delivery techniques, use of standards and indicators, and suggest four levels to measure systems performance and student performance (MERC,1997).

Some building blocks are in place and lessons have been gained over the past few years. If this were a document focused on sharing best practices it could be filled with wonderful

vignettes of great things occurring in classrooms all over the country focused on standards integrated into curriculum and instructional methods. This rabbit warren by rabbit warren approach to telling the story clearly has its place, arguably it is one of the most important ways to spread the news about any type of reform. From a policy perspective such stories confirm that the "state of the art is better than the state of the practice." Over the past few years it has become increasingly possible to find integration of vocational and academic curricula, especially within high schools. And in the near future, more standards based integrated curriculum will be available. The challenge is to move the whole state of the practice to the state of the art. Otherwise, common practice (or scale) will never be achieved. There are some serious problematic undercurrents impeding integration. These include at least the following:

- ✓ The "academics only" focus of many school reform efforts. This observation is not meant to denigrate the importance of academics, to the contrary. Yet a "crowding out" effect occurs if states' graduation requirements do not encourage integration of workplace basics including the needed personal attributes, career exploration, and occupation related learning within the course work. This issue highlights the "use of time dilemma" all K-12 schools constantly confront. Without explicit policies established by both the state and local policy making boards to use occupation/ industry clusters as an organizing tool, high schools, in particular will still be controlled by the silos of the traditional academic disciplines.
- ✓ The lack of clear state strategies regarding how to use career clusters as a cornerstone to develop programs of study that move progressively forward from the K-12 system into the postsecondary and/or work-based learning opportunities such as apprenticeship. The willingness of state higher education boards or commissions to use their regulatory powers over postsecondary institutions generates a part of this problem.[4] Also, the interest in using standards based programs of study within postsecondary education institutions is problematic.[5]

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[4] In most states higher education boards or commissions set at least minimal program criteria for local institutions that must be followed for the institution to receive state aid. This criteria could include the use of common career clusters that are used by secondary schools and other workforce development organizations.

[5] A recent publication by the State Higher Executive Officers (SHEEO) *Postsecondary Education and the new Workforce* provides a suggested framework for the states to improve the processes and systems of postsecondary institutions in workforce preparation efforts. SHEEO embraces the principles of the STWOA and calls for the states to expand the core concepts embedded in that legislation to fully embrace postsecondary education institutions. It does, not however recognize the utility of occupational standards as a key organizing tool to promote such efforts.

- ✓ The lack of a framework to present information about potential career pathways for individuals based upon a standards driven system.[6]
- ✓ The lack of information regarding career progression potential within most occupational standards currently used in the U.S.[7]

All of these issues need to be addressed by state policy makers. The last two points, the lack of a framework and information regarding career progression information that shows the escalating knowledge requirements normally attained through formal education, need attention at the national level. It is hindering the full potential of integrating the industry/occupational skill standards within the overall curriculum frameworks established by the states. They are also hurting students. It is difficult for them to grasp the full implications of why a standards based education matters for them. It limits their visions of opportunities and impedes their understanding of what it is going to take to get to the "top" if that is their aspiration.

MERC's definition (see Definition Section) is noteworthy in that it captures a strong message from the employer community by including the need to incorporate personal qualities (emphasis added) in the curriculum in addition to the academic and technical skills. The definition also takes lessons from the cognitive scientist that curriculum is best delivered in an applied, contextual manner.

The inclusion of personal qualities in their framework is important because it recognizes attributes such as being responsible, attentive, and respectful can be taught and need to be addressed. Employers note these characteristics are consistently lacking in many new entrants into the labor force. These attributes, too often, are not explicit parts of the school curriculum. This leads to employers consistently expressing concern about the lack of most of the generic workplace readiness skills in young applicants.

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[6] Australia, a country that is using a standards driven approach for all of its investments in education and training, provides an example of a possible framework to show career pathway opportunities in a context that also describes occupational standards. Through negotiations between industry and education representatives they established suggested equivalencies between the requirements of the workplace and the needed levels of education. An eight level framework shows the needed progressions (IEL,1993).

[7] Many of the traditional professional or industry-based credentialing services have focused on a single occupation and have not included emphasis on career ladders and/or multiple pathways for gaining recognition (IEL,1993). The occupation standards developed by states for vocational education are primarily used at the high school level (Border and Losh, 1996). The national pilot projects were not required or encouraged to address career pathway issues in the development of their standards. Thus, generating a gap of information for use in designing career pathways and broad based programs of study.

Foundation Skills

Just exactly what is meant by the term integration of standards driven curriculum may still be in development but it is possible to assert that priorities can be established for specific types of skills that need to be addressed as early as possible in the schooling process. Academic and workplace readiness skills need to be acquired long before high school graduation dates. States promoting proof of mastery for both of these types of skills prior to the last two years of free public education schooling are on the right track.

The 22 skill standards pilot projects were asked to focus part of their work on the skill requirements in high performance workplaces. Gaining agreement within the industry group regarding what constituted a high performance work organization was not always possible and some projects were more successful than others in achieving this goal. Some found the characteristics of high performance workplaces can be identified within the sector but that few, if any firms, were practicing all of the identified characteristics of a high performance workplace. Even with these types of identification challenges, it is possible to report a key general finding. The type of skills that are most likely to be required in high performance workplaces than others are: personal attributes, interpersonal skills, thinking, problem-solving, communications, basic academics, and an understanding of the use of technology. (See Definition Section, generic workplace readiness). All projects found the need for these skills to one degree or another but, as noted, more so, in high performance workplaces.

Some advocate that standards should only be developed by going to high performance work organizations, although a common usable definition of a totally high performance work organization has yet to emerge, despite substantial time and effort spent over the past five years to do so. Even if this approach were followed, it is highly probable the results would simply reinforce that which has already been documented. Everyone needs solid academic and generic workplace skills as the foundation.

Such findings support the work of other research (Carnevale, Gainer, Meltzer,1990; Department of Labor/Secretary's Commission of the Skills of the American Workforce (SCANS),1991; Cappelli and Rogovsky, 1995; and Murnane and Levy,1996). Additionally state after state's efforts to identify workplace requirements from their own employers affirm these findings. In the face of all these affirmations of the need for such skills, the education enterprise needs to explicitly incorporate such skills and knowledge throughout the learning process.

MERC's review of current efforts to promote integration led them to the work of several organizations. They found the various works of Norton Grubb and others from National Center for Research in Vocational Education provide the best research and synthesis base of lessons being learned across the country (NCRVE,1992). MERC identified one of the most impressive efforts to integrate academic and vocational education. It is through the work that is now over a decade old and under the sponsorship of the Southern Regional Education

Board (SREB). SREB's High Schools That Work (HSTW) initiative is generating impressive student achievement results and is now in 21 states and 658 sites throughout the country.

Another state consortia effort, supported by the National Center on Education and the Economy and the Learning Research and Development Center of the University of Pittsburgh, recently announced they are ready to "go on line." Their New Standards Project covers English/language arts, mathematics, science and applied learning opportunities for elementary, middle school, and high school. New Standards material explicitly ties content standards to performance. Their applied learning materials build upon the work of the SCANS and materials gathered from other countries that have had a longer experience than the U.S. in supporting workplace learning as a part of the initial education system.

Integrating Industry and Occupation Standards into Curriculum

The academics and the general workplace basics are the foundations. However -- and it is an important however -- individuals with occupation and industry knowledge are the more sought after employees and they earn more. While some employers may say "we will teach them the specifics" they are normally referencing machine specific or site specific processes. They are not referencing the type of skills that can be identified under the industry and occupation family skill categories discussed earlier.

Occupational standards have potency as instructional materials throughout any curriculum. The growing research and knowledge base regarding how individuals learn strongly supports the inclusion of contextual learning opportunities into the instructional methods used in all classrooms (including second chance programs). Clearly, not all contextual learning opportunities need to be geared to learning about the world of work. Yet, a cause for celebration exists in that so many work-related materials are being made available for use in improved curriculum and instructional materials. . If the academic basic level requirement for many entry level jobs are the sixth grade then sixth grade teachers have some wonderful contextual learning tools. The scenarios that many of the projects have developed are especially useful tools for classrooms from grade school and beyond.

Regardless of the some groups' rhetoric that fear insertion of career clusters and industry standards into school curricula, no one has argued that occupational or standards should, alone, drive all curricula. Such rhetoric defies history, curricula from high schools through Ph.D. programs in the professions, have long been users of occupational standards. Indeed, the professional schools (such as medicine, engineering, law, accounting, social work, the arts, and teaching) provide important models for integrating work-based requirements into curriculum.

Mention must be made regarding the academic knowledge and skill requirements identified in several of the skill standards. Concern has been expressed they are too low because they are geared to the sixth or the eighth grade levels. Such observations can be heard, most specifically from individuals familiar with the nationally developed academic standards.

Questions are raised about why employers are calling for high academic standards if lower standards are required for the workplace.

Observations such as these lead to substantial debate on many fronts. Some have argued the solution is to ignore skill standards as a tool for use in education reform efforts. Others have suggested the solution is to adopt the academic standards as the base for industry standards -- this solution ignores the potential legal implications of a certification service that requires the assessments be validated against actual workplace requirements.

Responses to such observations are also varied. A representative of a national skill standards project has countered some of these complaints with a retort. "It may be eighth grade mathematics but less than 50 percent of the individuals coming to our apprenticeship program can pass our entry test and it is costing our industry millions of dollars each year to finance remediation courses!" Others have suggested the process to develop the academic standards was flawed by not including a wider range of stakeholders in the process including those familiar with the requirements of the workplace.

It is correct that occupational standards validated in the workplace by many of the pilot projects do not require high level mathematic and, in some cases, science knowledge under the category of basic academic skills. However, the communication and critical thinking skills identified for in even the entry level occupations call for higher levels of content and performance (some past high school expectations).[8] It is important to note the occupation specific skills often require knowledge that is not explicitly stated in academic terms. Often the occupation specific skills presume a level of knowledge considerably higher than that identified in the core academic category. It is also correct that students are not graduating from schools with the required skills to become employed in jobs with good career potential.

It is this latter point, students graduating from high school (and sometimes college) without proving they have mastered the core academic and general workplace basic skills must remain a central concern. The cost implications for individuals, families, and taxpayers are high. For example, one of the projects, whose standards have been considered too low by developers of K-12 academic standards, have geared their materials to upgrade (emphasis added) the curriculum for community colleges because most of their firms only recruit individuals with at least associate degrees.

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[8] The basic academic skills and general workplace skills identified in the 22 pilot projects and selected others have been pulled together into one set and reorganized into categories being used by O*NET. This material has also been cross-walked with national academic standards. Additionally, for the basic academic skills a set of equivalency levels have been used to correlate the resulting "common standards" with education levels. Work in this area should eventually result in the development of relational databases between the two types of standards plus provide assistance to curriculum and assessment activities (IEL and V-TECS, 1997).

Building a Support System

One of the lessons that can be gleaned from other countries who have had more experience than the U.S. in the development of standards based curriculum is that identifiable mechanisms need to exist that help translate the work requirements into useful material for the education enterprise (IEL, 1993). Since that study, two other countries (Australia and the England) have developed closer ties between the education policy making bodies and the industry standards development organizations. In the U.S. there are some efforts that can be used to build support systems to help integrate standards based materials into curriculum.

For example, CORD is currently working with a consortia of states to launch a more systemic approach to promote integrated curriculum. They want to overcome the problems of slow and isolated change that has characterized efforts of the past two decades. They are organizing curriculum around 11 career families/clusters. They view this effort as an evolving vision. The design from which they are building the effort incorporates key principles of the STWOA legislation and the Tech-Prep initiative. They are taking advantage of the materials from the national skill standards pilot efforts by incorporating these standards into the curriculum material being developed.

Several national skill standards pilot projects are involved in curriculum integration efforts. Illustrative examples of such efforts show a wide range of approaches are being pursued:

- ✓ Direct Developers of Curriculum. EDC and CORD and the apprenticeship sponsored projects (Electrical Contractors and Laborers-AGC) fall under this category.
- ✓ Facilitation Support Services. This category has subgroupings:
  a. Work through state consortia;
     1. Consortia focused on establishing validated occupational standards; V-TECS, the manager for the air conditioning, heating and refrigeration project, is sharing its occupational analysis work with its member states who then develop curricula material. This approach reflects the mission of this organization.
     2. Consortia of Specialized Professional Educators; the health care standards project was sponsored by the National Consortium on Health Science and Technology Education and that organization develops curriculum materials as a part of their mission.
  b. Work through national vocational student organizations (VSOs)[9];

[9]VSOs are organizations legislatively recognized in the Perkins II legislation. The U.S. Department of Education has recognized the following organizations: Business Professionals of America; Distributive Education Clubs of America; Future Business Leaders of America - Phi Beta Lambda; National FFA Organization; Future Homemakers of America; Health Occupations Students of America; National Postsecondary Agriculture Student Organization;

1. Future Farmers of America (FFA) was the grantee for the agricultural biotechnology skill standards project and they have developed curriculum guidelines and other materials for use by their state and local affiliates for modifying curriculum in agriculture/agribusiness industries.
2. National Retail Federation (NRF) had as one of its core members of its partnership, the Distributive Education Clubs of America (DECA). Through an NRF/DECA agreement, state business partners boards have been established to increase dialogue between educators and business people. The purpose is to improve the educational programs, utilize the industry skill standards and promote better understanding of career pathway opportunities and workplace training.

c. Work through professional societies;

1.The American Chemical Society (ACS) through its membership networks has established local Alliances to assist in the infusion of the standards across several chemistry-based industry sectors around the country. ACS facilitation services include materials to assist local networks of employers, high schools, and community colleges in developing standards based programs of study. This includes materials to help instructors assess student knowledge.

2. The American Welding Society, an organization with a long history of providing certification services, many of which are required in the construction industry, has recently focused their attention on program standards. A key feature of their work is materials that define the competencies needed by instructors of entry level welders. The focus on instructors is due to the strong belief that their lack of knowledge about the standards required in the workplace was generating a substantial road block in the development of qualified welders.

3. The Human Services consortia has developed curriculum related materials for general distribution but is also working with key accreditation organizations to infuse the standards into the programs of study used by those organizations.

d. Work through industry-sponsored education foundations;

1. The National Automotive Technicians Education Foundation, supported by an array of automotive firms and trade associations, centers its work on program standards used by both high schools and community colleges. Their materials are the only ones now in use in all 50 states. New materials include qualifications needed by instructors and

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National Young Farmer Education Association; Technology Student Association; and Vocational Industrial Clubs of America. The national governing bodies are composed of representatives of the private sector and educators. The private sector representatives on these boards have a long history of providing information to educators about the skill requirements within the occupational areas. The VSOs have state and local chapters.

other specifications required for a quality program. The materials also include applied academics and workplace skills required of workers.

These examples reflect a range of possible directions to build more effective bridges between the schools and industries. However, just focusing on curriculum is not sufficient.

ASSESSMENT

Assessment and testing are fundamental to any conception of a national standards system. Assessment and testing are the core tools to recognize the competencies of individuals and to promote improved hiring and placement practices. Assessments also are key career planning tools for individuals. Information derived from assessments can help determine the effectiveness of education and training programs.

Third party assessments are an essential part of any national assessment framework. Many of the most respected professions have well established national examinations that provide the model for credentials that are recognized across states. It is this third party assessment model that is envisioned in the STWOA and the NSSB legislation. At this point in history the third party assessments most sought after by the employer community take two forms. The first are the professional credentials often coupled with state licensure requirements. The second form addresses occupation specific skills. The sponsoring organization for the credential is important to most employers. Many want to have assurances that representatives of the industry or a industry connected professional society are in the lead in the management of the assessment system.

Most of the current public attention has been given to developing academically focused assessment services for the K-12 education system, as many would agree this is the base on which to build. Different types and levels of activity standards assessment are currently underway in all states so any national listing will not be absolutely accurate or up-to-date. All but one state has some form of minimum competency tests that are administered to students at certain grade levels. In most cases the consequences for failing the test do not exist. However, states are moving beyond minimum standards to higher ones. Many are doing this by using materials culled from national academic standards. All states have recently produced some form of content standards and 31 states have or are in the process of adopting some form of related performance standards. There are 22 states committed to some form of formal assessments based upon these emerging higher academic standards. However, these new types of assessments are still being phased in most states (CCSSO,1996). Eight states have established some form of differentiated diploma system linked to the standards, and 13 currently have or will have graduation exams based on 10th grade standards or above (AFT,1996).

It is difficult to determine from national information sources which states are beginning to include workplace readiness type of skills in their assessment systems; yet this is occurring.

For example, Indiana, Ohio, Michigan, Maryland, and Oregon have explicitly included such skills in their content standards. Vocational testing is recognized as a required part of a state's overall assessment in three states, Kentucky, North Carolina and Tennessee (CCSSO/NCREL,1996). However, this count may reflect definition dilemmas as other states, such as Ohio, require exit exams for all students in occupation specific programs. Oklahoma has a strong history of using on-demand assessments with students in their vocational programs at the high school also in their postsecondary programs of study.

The STWOA pushes assessment issues even further for the states by calling for the development of portable credentials. The concept of industry recognized portable credentials found its way into STWOA for the following reasons: 1) to connect the work-based learning with the school-based learning; 2) to build credibility with the employer community; and, 3) to help ensure the credentials are based on national standards that would be valued across state lines and across various institutions of higher education and companies within an economic sector. The movement of the workforce and the needs of the global economy do not allow any state to act alone in the awarding of credentials. That is not to say states do not have a central role in the development of a portable credential system because they clearly do. Most specifically they must determine the school-based assessment components of the effort. To date, no state has been able to develop a fully functioning portable credential strategy as required by the legislation. There are some pilot demonstrations underway, but they are in their infancy.[10]

An Assessment Framework

Ananda and Rabinowitz (1995) provide an "ideal model" for a certification system that begins at the middle school level with general career awareness training and moves along to occupation specific A key feature of this model is the relationship of the categories of standards described earlier -- core academic, generic workplace, and industry specific core, occupational family, and occupational-specific -- required for success in any given job or career. Figure 3 depicts the relationship among the proposed program levels, types of standards, assessment purposes, and certification levels.

[10]The Office of Vocational and Adult Education, the National STW Office and the NSSB have joined forces to support three different state consortia to develop prototypes assessments in manufacturing, business and administrative services, and health care.

FIGURE 3
Ideal Industry Skills Training Certification Model

Program Level	Type of Standard: Academic	Generic Workplace	Industry Core	Occupational Family	Occupational Specific	Assessment Partners*	Certification Level
Occupational Specific • PostSecondary Training Institution • Industry Setting	X	X	X	X	X	*Industry* / Education	Job Entry -- Career Specialization
Grade 12	X	X	X	X	X	*Education / Industry*	Occupational Family
Grade 10	X	X	X			*Education* / Industry	CIM
Middle School	X	X				*Education* / Industry	None

* lead partner indicated by italics
Source: Rabinowitz and Ananda , *Institute for Educational Leadership*

This model recognizes that the assessment system needs to be based on age and stage appropriateness. Assessment processes must be flexible yet driven by commonly agreed upon goals by all the relevant public governing bodies and industry-based organizations. Goals can range from a relatively informal reporting of a candidate's current skills (to help design an individualized training program) through formal certification. While industry and education are partners in the development of assessments, at different times and levels, each one is in the lead. For example, when career awareness is underway in the middle school years, assessment would be part of the ongoing academic testing program. However, for industry and occupational specific assessment, industry should take the lead to ensure the portability of credentials across state lines.

Under this model, assessment and certification of occupation specific skills do not occur until after high school. This assumption may or may not be appropriate for all occupations and should be discussed among representatives of industry and the states. There is an assumption built into the model that the primary means of assessment related to occupational families or occupation specific skills should be on-demand.

No model is ever static and just as the definitions change over time due to experience and usage, so would any ideal model of an assessment system to blend the needs of both the public and private sectors. There are three key reasons for showing the model: 1) it can be used as technical tool for anyone charged with a responsibility for designing assessment systems; 2) for portable credentials to become a reality the model portrays the necessity for several key stakeholder groups to collaborate to generate even some semblance of a coherent assessment system that will be understood by students, workers, and employers; and, 3) to raise the subject of who pays. The latter two reasons are by far the most significant for the purpose of this white paper.

Improving the quality and value of any credentials will require states to work together and requires the NSSB to work with the states and industry networks within those states. Even though the federal government is not identified in the model it has a critical role to support the growth of such a system. The federal government is in the only position to provide the glue to make the system work.

States are already focusing on improving the academic assessment processes used. The Council of Chief State School Officers' (CCSSO) Assessment Center provides collaborative assessment support for the states in this area. Hopefully, all states, will soon be able to incorporate performance standards with their academic content standards. All need to pay substantial attention to the assessment of workplace basic skills. Developing strategies to have commonality of assessments across all the states regarding these core workplace basic skills would be the most advantageous for students and employers alike.

Developing better assessment service does not stop at the school house door. Assessment efforts within the second chance programs (e.g., job training and basic education programs) need to be re-tooled to incorporate standards-based materials. Students from these programs

need to be prepared to take industry recognized credentialing tests. The state organization(s) responsible for oversight of these programs need to be engaged with their counterparts in the education agencies to be aware of and participate in the roll-out of more comprehensive assessment efforts geared toward the needs of the workplace. Also, the federal agencies with lead responsibilities for second chance programs should assist their networks of providers in the development of standards-based assessments.[11]

The working draft of the NSSB's standards system calls for core credentials to be the backbone of their framework for each economic sector. The working definition of a core credential is to include the core knowledge and skills common to, and essential for, the entire sector. There is a desire for these core credentials to be awarded first before an individual would be eligible to be assessed for a particular concentration and only after these credentials were awarded would they have the opportunity to receive credentials in specialties. The working definition for a concentration area is to include knowledge and skills that cover a broad area within the sector. Such knowledge and skills would be more targeted than the core level but less specific than the specialty level. A specialty area is considered the most detailed component in the skill standards framework, targeting particular jobs or perhaps the needs of specialized firms (Federal Register,1996).

The NSSB has not yet developed assessment criteria so making any speculations regarding how an NSSB endorsed assessment strategy will become operational is not possible. However, the general outline does raise a number of financing questions. There is some skepticism on the part of several of the pilot projects that employers will be interested in fiscally supporting either the development of or find the business value in paying for core and concentration type credentials. This may or may not be the case but the doubts exist (Wills and Kaufmann,1997). Also, and perhaps most importantly, is the need to sort out the relationship between the responsibilities of the public education system for assessments of their students and that of a national voluntary skill standards partnership.

Who Pays?

An answer is not given to the question because it would be impossible to do so, but it cannot be ignored. The next best approach is sorting out some of the issues surrounding the question. The issue of who pays for the differing types of assessments is a significant one. The full scope and cost of creating the ideal model is not known but it is certain it is a costly endeavor. Ananda and Rabinowitz (1995) argue, and appropriately so, that students should not be expected to pay for assessments that are a part of a state sponsored assessment system

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[11] OVAE has supported the work of the non-profit Comprehensive Adult Student Assessment System (CASAS) for several years. CASAS is a learner-centered curriculum management, assessment and evaluation system that continuously upgrades its materials to reflect the changing requirements of the workplace. Many second chance programs use the DofEd endorsed materials.

used for graduation requirements. Given federal and state tight budgets and cost of supporting the development and administration of high quality assessments the means to finance such efforts often becomes a stumbling block. The call for the states to issue portable credentials in the STWOA adds to the challenge for the education system.

Many would consider the employer community an obvious candidate to turn to for possible support in the financing of new forms of workplace related assessment. Employers have often indicated interest in skill standards credentials for the very purpose of reducing the cost of recruitment. However, experience from the 22 pilot projects provides mixed messages regarding assessments. Acceptance of certification as an ultimate outcome received mixed reviews from industry primarily due to fears the certification would become mandatory due to government involvement. However, the projects that have gained consensus to support credentials have been those that have centered attention on specialty skills. (Fees for such assessments have been a primary income stream for all kinds of credentialing organizations and presumably will be the key flow of income for the NSSB recognized partnerships.)

This generates a substantial dilemma, in that it is not probable that states and local education and training institutions can reasonably expect to shift the full cost of assessments to the private sector. It is clear many employers bear a substantial financial burden in the testing of workers. Numerous examples exist where hundreds or even thousands of applicants must be tested in order for even a few applicants to pass a screening test. These test have a direct correlation to the job specific requirements of their own workplace and cannot easily be substituted without assurances that an adequate broad-based validation study has occurred.

By using the ideal model as a starting point it is possible to address some key financing issues in a manageable way. For example, assume that assessments for workplace basic skills (not the personal attributes[12]) would not be developed by each individual school district nor by each state. Also assume the cost for each NSSB recognized voluntary partnership to validate these cross-sectors skills, which do not change as rapidly as specific technical skills, is beyond the partnership's means (both technically and fiscally) and perhaps even interest. Then other more cost efficient ways must be found to develop assessment tools for the workplace basics skills.

The natural federal agency to take the lead in supporting such an effort would be the Department of Labor. This is for multiple reasons. Two obvious ones are its responsibilities for: 1) second chance programs; and 2) assisting job seekers and employers through the labor exchange services. Alone or in partnership with NSSB and other federal agencies (e.g., OVAE that supports CASAS) they could take the lead to support validation of workplace basic skills across all sectors on some type of multiple year schedule. They could own the

[12]Personal attributes are very difficult to document through on-demand assessments. These are better documented through other means such as portfolios, volunteer and work experience etc..

resulting test(s) as they do now the General Aptitude Test Battery (GATB) or they could "certify" and/or partner with public and private sector firms to generate assessments.

Through collaboration of several stakeholder groups it should be possible to "unbundle" the assessment components (i.e. academic, workplace basics, and specialties) in ways that can make sense. A beginning point may well be bringing organizations together to develop some common strategies. There are some natural organizations that can help. For example, the CCSSO's Assessment Center, representatives of the Center for Education Statistics, the Department of Labor, the U.S. Department of Education-funded research center on assessment, also their funded laboratory with the lead role in assessment, WestEd, the American Psychological Association, and other organizations with special expertise in assessment-related issues. One possibility for promoting such collaboration would be if the NSSB establishes an advisory panel of representatives from these organizations to promote the much needed coordination.

PROGRAM APPROVAL OR ACCREDITATION PROCESSES

Just as there cannot be a national voluntary skill standards system without portable credentials based on the third party assessment, some believe that without program standards you will never have people qualified to pass the tests -- whatever form they may take. (This observation was made by a skill standards project director who has had long years of experience in managing international certification services.) Such an observation is supported by a long history of industry associations and professional societies seeking better qualified graduates. Program standards are a natural by-product of skill standards. How they are used and by whom needs to be carefully considered.

The proliferation of specialized accreditation organizations has grown rapidly since early in this century. The medical and law professions established their occupation specific oversight organizations to judge the quality of institutions graduating individuals for their professions. The growth of such organizations has focused primarily on postsecondary institutions. Periodically presidents of institutions have taken the lead to try to find the means to establish some order to the processes. The latest general uprising emanating from the presidents of postsecondary institutions occurred about five years ago. Their concerns centered on cost and proliferation of specialized program accreditation activities occurring on their campuses. A new organization emerged as a result, the Commission on Recognition of Postsecondary Accreditation (CORPA). CORPA has worked with the Assistant Secretary for Postsecondary Education to seek a more coherent process for accreditation purposes. How much accreditation is enough is the primary issue. Many institutional leaders believe that specialized accreditation is more of a fight over financial resources and control of the education program than it is over standards and sound educational practices. These are natural tensions that will remain in any search for use of standards to assist in the measurement of quality programs (Miller,1995).

Promoting program quality specifically for programs requiring less than a bachelor's degree has had a special set of problems. For example, the state of Georgia several years ago established a state agency responsible for providing oversight for technical institutions. They required that all occupational training be based on industry standards. They wanted to ensure that there were common programs of study with the same indicators of success used across all of the institutions in the state. Unfortunately, they found a reluctance of the institutional accrediting body for their region to incorporate such requirements. Other postsecondary technical schools across the country had similar problems with the academic-focused accrediting organizations. From this experience a new accrediting body, the Commission on Occupational Education Institutions, was created and has gained recognition by the U.S. Department of Education and is nationwide in its scope (Miller,1995). The state of Washington has recently followed suit by using industry standards to drive the program approval process by the State Board for Community and Technical Colleges. The STW implementation strategy is based on developing industry standards to guide the development of competency-based instruction (MPR,1996). As noted earlier NATEF, over time, has developed substantial leverage over the content of automotive service programs. Even in states with minimal control over local programs, the force of industry expectations have driven acceptance of these national program standards.

Miller provides caution regarding accreditation, beyond the tensions discussed earlier. Accreditation is an involved and expensive process. But, other less expensive steps can be taken such as preparing well-designed and implemented information and consulting programs. This can include information essential for developing effective curriculum and instruction. Staff or "certified" consultants of the sponsoring organization could be tapped to make presentations to instructional staffs and seminars could be sponsored by the standards body as well. "Retired" forms of certification examinations could be sold to educational providers for a marginal fee to help promote the quality of the programs.

Lessons from some skill standard pilot projects suggest that one of the most positive values of standards for accrediting bodies are that the standards allow the quality assurance organization to focus on program outcomes and substantially reduce the reliance on inputs. If more accrediting bodies were to adopt standards for use in this way it may help eventually minimize some concerns of institutions plus generate improved accountability processes for both the institutions and the national accrediting organization.

Connecting to International Quality Assurance Systems

Other approaches to quality assurance can be adapted from industry-based models. The International Standards Organization (ISO) 9000 series of standards focuses on quality management and assurance. The American Society for Quality Control (ASQC) is the international representative for the American National Standards Institute (ANSI) on the international committee. The ISO 9000 series framework includes a requirement for training. It states that:

"The supplier shall establish and maintain documented procedures for identifying training needs and provide for the training of all personnel performing activities affecting quality. Personnel performing specific assigned tasks shall be qualified on the basis of appropriate education, training, and/or experience, as required. Appropriate records of training shall be maintained." (ISO, in Sheets,1994).

ASQC has published a set of guidelines information on how to apply ISO standards to education and training providers being used by some education institutions. Also some states, working through the National Governors' Association, are exploring the establishment of a common framework to measure quality based on ISO principles and those found in the Malcolm Baldrige Quality Award (Sheets,1994).

Sheets, an experienced researcher and consultant in the area of standards development and use, advocates that the NSSB should employ the work of ISO, collaborate with the United States' international standards organization, ANSI, as well as the U.S. Department of Commerce's National Institute of Standards and Technology (NIST), which is responsible for the Baldrige Award. The purpose of such collaboration would be to tie quality assurance techniques employed by the private sector and recognized internationally with that used by the education and training system. He recognizes that the current efforts do not yield an obvious framework that will exactly match the needs of the NSSB but feels one can be devised. This makes sense. If such a framework were to be developed by NSSB, it will need to include lessons learned by those that have established successful program standards. Whatever such a framework would look like, the cost, particularly for publicly funded institutions, will need to be considered.

STAFF AND LEADERSHIP DEVELOPMENT ISSUES

The need for staff and leadership development cannot be overstated. The evidence abounds that without such support a standards driven system will not become part of the complex technologies of teaching or useful in providing information to help policy making within the education enterprise. Without leadership development for individuals in state and local policy making positions, the utility of standards will not become a part of the operating systems that guide the education and workforce development efforts. Leadership and staff development efforts need to be built upon a "value-added" strategy for each of the various stakeholders. If standards and related products and services cannot help make everyone a winner, the acceptance of standards will be marginalized.

Unfortunately, due to substantial reductions, and in some instances elimination of research and development funds, the federal government is currently faced with considerable gaps in its own infrastructure to support curricula development, identification of best practice, and staff development support services. This lost of funds makes the challenge of helping to establish a standards driven education enterprise system clearly more difficult. This loss requires local, state and federal agencies to find new ways to get the job done.

The topics that need to be addressed include several "hot button" issues. Standards and assessments often conjure very negative responses on the part of teachers and school administrators. Anti-federal and state control flags are waved. Emotions run high within some minority communities that standards and assessments are just another way to discriminate. Animosities between academic and vocational educators arise. Reform weary educators believe another fad is upon them. Already noted is the concern of some vocal conservative groups that standards are mind control of children. Turf issues between agencies arise. The list can go on. Framers of professional development services will need to address such issues. Some can be addressed by quality materials that explain the whys, hows, and successful practices. The message carriers are important. While the federal government has a clear role in facilitating some of the professional development activities, they alone cannot carry the message. States, local school districts, national education support networks (e.g. HSTW, New Standards, NCRVE's Urban Schools, Accelerated Schools, national professional organizations, national skill standard organizations, and national membership organizations such as CCSSO, SHEEO and the American Association of School Administrators (AASA), and others) are all key actors in the professional development arena.

The whole education enterprise needs to be included in any such effort. This is especially true for the providers of second chance education and training services. They should no longer be ignored. These organizations are dealing with the needs of some of the most challenging youth and adults. They generally are working in conditions with substantial resource constraints and staff development opportunities are even more rare than those available to their counterparts in the publicly-funded education institutions. Many receive their core funding from the U.S. Department of Labor that long ago suffered reduced funding for professional development services. The few available resources for leadership and staff development need to be, at least in part, directed toward helping the large network of second chance providers become familiar with and use standards driven competency based curriculum and assessments. Lessons can be drawn from the work of the National Institute for Literacy. Their Equipped for the Future effort is explicitly a standards based strategy to improve adult literacy programs.

A logical beginning point is to consider how to maximize current leadership and staff development efforts across a wide range of stakeholder groups including, but not limited to, the following: teachers, school administrators, school districts policy makers postsecondary institutions, teacher education institutions, training providers, state administrators and policy makers in K-12, higher education, workforce development, statistical collection and analysis agencies, economic development organizations, local, state and national employer organizations, unions, national and state intermediary organizations such as representatives of public officials and educators, state consortia groups, national standards developers, national education and workforce development support organizations, parent advocacy organizations, and foundation funded leadership development organizations.

The span of responsibility and capacity to influence the ultimate outcomes varies widely within these aforementioned groups but each has a role. The listing does not assume equal

treatment and attention to all of the groups. The need to understand the value of and how to develop and use standards related materials varies significantly among these different audiences. Yet, none should be ignored when considering leadership and staff development issues. From a federal and state perspective, a minimal but useful strategy would be to share information through materials targeted to a particular audience. For example, a state could prepare materials for economic development organizations about career clusters, priority occupations, and national occupational standards that have been selected for special emphasis.

Strategic allocation of current resources is the essential starting point. Federal facilitation leadership is essential, for without it the nation will not build a standards-driven education system. Three federal departments, Education, Labor, and Commerce through NIST, and the National Science Foundation are increasingly coordinating efforts. This is a logical area for more coordination. Leadership of these organizations need to champion and promote a standards driven system and assure their own agency's field staff development efforts are used to promote the overall activity.

Federal agencies can and do support leadership and staff development efforts through the work of research centers and regional laboratories, the framing of issues for competitive grants and contracts, funding of membership-based national organizations for technical assistance, and networking and intergovernmental meetings that occur in a variety of milieus. An example of a partnering approach using a peer network organization to help promote standards and integration of curriculum is the work of the California School Boards Association. A grant was given by the OVAE to this organization to provide school board members, superintendents and their districts with policy-level implementation strategies and effective policies necessary to integrate academic and vocational learning (CSBA,1996).

A strategic effort could begin at both the state and federal level by asking what is being done in <u>all</u> currently funded leadership and staff development efforts to promote:

- ✓ the use of standards across all levels of the education enterprise (K-12, postsecondary, and training);
- ✓ the integration of academic and occupational standards (where appropriate);
- ✓ the use of occupational/career clusters as tools for organizing workforce development services;
- ✓ the use of occupational/career clusters as tools for organizing competency-based curriculum development;
- ✓ the use of standards to promote development of programs of study that cross institutional boundaries;
- ✓ the use of assessments in classroom and beyond; and,
- ✓ the use of standards and assessments within the employer community.

This is not a complete listing of all the possible questions, nor does it need to be. The intent is to suggest that federal agencies need to take the first steps by looking across, down and

around to ascertain that their professional development efforts are geared towards common goals.

If such an undertaking were to take place (it need not be an onerous one) the results will, no doubt, reveal limited crosscutting work being undertaken. This will probably be true even within the various operating divisions of a single department. The DofEd of has already established a cross-cutting professional development forum that has responsibility for coordination and it could be used to identify opportunities to improve professional development strategies to promote a standards driven system, but other departments and agencies need to be engaged in the overall effort.

Any undertaking to promote professional development materials for all of the different stakeholders will necessitate "pulling together" core materials addressing how the pieces fit together. It will also require listening to what the end users want, in what format(s), and in what milieu. National networks of institutions and peer membership organizations can inform the process and be part of the development of products and professional development opportunities for their membership. Beyond taking the lead in packaging information that knits the pieces together, the federal government can spur the expansion of professional development opportunities through its ongoing activities such as sponsoring or co-sponsoring seminars, conferences, and institutes. From these activities, materials tailored for different stakeholders that address "how to and where to go" would be of high utility. Several national skill standards pilot projects have developed quality materials that should be used.

A word of caution is in order. The standards movement will not be well-served if the information provided does not discuss and explore the full range of issues around standards development and use. The stakes are too high. No one organization has "on tap" the knowledge to cover all these issues. In certain areas developing training teams that cross cut traditional boundaries may be essential, (e.g., integrated curriculum for use in schools, training institutions and worksites). Many of the skill standards pilot projects have or are developing networks of experienced and "endorsed" providers of professional development services. This kind of approach with a network or consortia of providers working in teams may yield the deepest utility of standards.

The necessity for such work will be continuous and hopefully escalating in intensity and quality. Much of what needs to be done suggests either a redirection of current resources or simply including a standards focus in current efforts.

INFORMATION SYSTEMS AND SERVICES

An integrated academic and occupational standards-driven system is an information-driven system, even at the most rudimentary level. For a national voluntary system to be nurtured, a substantial amount of attention needs to be given to the development of an information infrastructure that can grow, be easily accessed, and have multiple uses. Using the analogy of

the need to build a skeleton, one could think of information services and systems as the backbone.

Systems Issues

We are living in an era when truly exciting new vistas are opening that will provide enormous support for the development of a standards-driven education system. With forethought and cooperation among federal and state government organizations responsible for producing and disseminating data, industry associations, education institutions, and others involved in the development of standards, much can be accomplished that will:

- ✓ contribute to a common language;
- ✓ reduce time and cost of developing standards;
- ✓ promote communication among organizations responsible for education and workforce development systems and programs;
- ✓ promote access for consumers (students, teachers, trainers, counselors, employers, job seekers); and,
- ✓ improve the chances of being able to judge the efficacy of the system.

There are several significant efforts underway that can provide help to make all of this happen. Most notably the replacement of the out-of-date Dictionary of Occupational Titles -- the backbone of the occupational classification systems. Its replacement, O*NET, is currently under development. O*NET will become a core product and service of the labor market information system for the country. There will no longer be a hard copy, ponderous document but rather an on-line interactive computer-based system.

O*NET will be used in another current initiative to upgrade the labor market information distribution systems throughout the country. The Department of Labor, responsible for O*NET development, has also launched a major upgrade of the labor market information services, called America's Labor Market Information System (ALMIS) and is sponsoring new approaches for individuals to access that information and local education and training resources. This is, in part, being done through the development of One-Stop Centers throughout the nation. The term one-stop may be a misnomer because it is just not a place to go but also takes advantage of new technologies to provide easy access and user friendly information based services to all kinds of clients in a variety of settings. In other words a new information age infrastructure is coming on line. All these efforts are still in the early stages of implementation.

With forethought, and by using technical working teams drawn from a variety of federal organizations and states, much can be done to help in bringing on line information about both academic and occupational skills standards that is accessible to all. Relational data bases can be constructed that could identify common skill requirements across a wide range of economic sector, data bases that correlate academic and occupational standards can become common place. This is possible to do. It can, as well, save taxpayers substantial monies.

The capacity exists; the will to make it happen may not. Common definition issues, discussed in this paper, can be a stumbling block. To make all these glowing projections a reality, "a thousand flowers blooming" approach for describing standards would seriously hamper any such effort. This means that those involved in setting the framework for a skill standards system need to establish some basic operating groundrules regarding what goes into common data bases. It may well mean that O*NET developers will need to change some of their working definitions. States will need to agree to follow some common design rules as systems are established. In other words, collaboration will not come easily unless all the stakeholders understand the value-added purpose. Noble reasons can be made. Such as -- by doing so -- standards have a greater chance of becoming household words and will be discussed at the dinner table and on the news. There is a less noble reason and perhaps more practical. There is not enough money for any of the key stakeholder groups to go it alone, particularly the NSSB; they need to rely on others. This does not mean they cannot influence the work of others.

The statistical agencies will need to be involved in several different fronts. The Bureau of Labor Statistics is a key agent regarding the labor market classification and information system. The Department of Education's National Center for Education Statistics monitors the condition of education in this country. They recognize the many challenges that lay before them to use and impact of standards within the education enterprise (U.S. Dept. of Education, 1996). They have had a lead role in tracking the progress of academic standards and they play a key role in designing national assessment efforts through their oversight responsibilities for the National Assessment of Education Progress (NAEP) and international comparison studies. As the occupational skills standards takes form, they will need to give more attention to documenting the use of them. Also, as the collectors of information regarding all education program offerings in all institutions, some analysis of the utility and use of career clusters will need attention.

Service Issues

A range of issues around information based services abound. However, for the purposes of the focus will be on the particular needs of students, teachers, school and job search counselors, curriculum developers, and others who need support. The challenge is to help ensure a strong career guidance system that includes standards-based information.

Career guidance and job placement counseling services occur in many venues and take many forms, many of which are not based on solid information about choices and opportunities. Professionals in the field of guidance and counseling have long been aware that information data bases are essential tools for their work. They are aware that information technologies must be used to stretch the limited staff resources available for career guidance and job placement services. There are some rich materials that have been developed over the years by guidance and counseling professionals in this area, which have been greatly aided by the NOICC and their state counterpart organizations, but no single individual or organization claims perfection, to the contrary.

All of the aforementioned groups need to have standards-based materials, organized around their state's career clusters that are packaged in such a way it is useful for their own work. National and state skill standards need to be included in the materials. The distinctions in types of standards (e.g., occupational family, industry core and occupation specific) could be used to help enhance the packaging of guidance materials. They can help an elementary teacher understand how to use a field trip as a teaching tool. Career pathway information can help a guidance counselor assist students learn about what it takes for a bank teller to become the Chief Executive Officer of an international bank. Materials, developed in concert with industry representatives can give life to the dry facts. Videos telling the stories of what type of occupations exist within an industry, what it takes to become an entrepreneur, and providing students with applied learning opportunities within the industry are helpful information-based services beyond data.

Clear linkages will need to be established between career guidance and counseling staffs and organizations knowledgeable about skill standard at the national and state levels.

NATIONAL AND STATE LEADERSHIP RESPONSIBILITIES

Throughout this paper suggestions have been made regarding several important actions the federal government can follow to improve the likelihood that a standards driven education system can become a reality. Suggestions have also been made about possible approaches the NSSB and states could pursue. Following are recommendations not covered in the previous sections.

Five years ago, one of the findings in the IEL baseline study about how standards are used addressed the particular issue of building the bridge between education and industry based standard setting bodies. This particular finding was informed by the lessons of other countries and the experiences here. The recommendation stated:

> "Focused, sustainable, and jointly owned" institutions will be necessary. For lack of a better descriptor, we have called these, linking institutions. There are several approaches that could be considered for the development of such institutions. For example, organizations could be established around major occupational clusters or geographic regions. The essential point is that industry representatives, state governments, and most particularly the representatives of secondary and postsecondary institutions must come together . . . to continuously translate skill standards into curriculum, update curriculum, instructional materials, and make it widely available to all types of education and training institutions (IEL,1993).

The work that has gone on since then has reinforced the general notion contained in that finding. Among the lessons learned, during the past five years by the pilot skill standards projects are some that specifically relate to the education enterprise. A study specifically

focused on the role nine of partnership bodies and how they are sustaining their work after withdrawal of federal funds found:

- ✓ Educators who participated are enthusiastic supporters, but acknowledge there are substantial impediments within the education enterprise to using the standards. Better mechanisms are needed at the state level to promote integration into curricula frameworks and programs of study at the secondary and postsecondary levels and to help instructors use the materials.
- ✓ Representatives from education, while appreciating the experience, varied in their capacity to represent anyone other than themselves. From a perspective of the overall partnership responsibilities, many individuals' capacity to influence other education organizations is limited due to the lack of an infrastructure that allows reporting to each other. For other representatives, particularly those involved in some type of program accreditation, the connecting links are more obvious.
- ✓ Widespread adoption within education institutions is highly dependent upon the education/workforce development agendas of state government and most particularly how the states have organized their occupational clusters within the school-to-work and vocational education programs. The pilots are finding the necessity of going state-by-state and in some cases local school district-by-local school district, costly and inefficient.
- ✓ Education-based networks need to be supported and/or developed. The representatives of education and training organizations have limited outlets for influencing their counterpart institutions. A broad range of interrelated efforts is required to infuse effectively and efficiently the standards into the education enterprise. States need to be involved in a substantive way but this alone is not sufficient. Education specialists (e.g., those responsible for apprenticeship training, and occupational specialties) need to participate in networks. These networks must include support for promoting distance learning and assessment opportunities (Wills and Kaufmann,1997).

These lessons suggest that as national voluntary partnerships are formed by NSSB, the education and training providers selected need to cover the full range of organizations discussed under the section describing the education enterprise. This should include apprenticeship training organizations, representatives of industry sponsored colleges and universities, and representatives of public institutions. These educators should be asked to help design an infusion strategy that would tap the existing networks (e.g., the array of state consortia, VSOs, curriculum developers, academic standards groups) of education organizations that will need the material.

Skill standards partnerships may find it advantageous to establish a companion organization or at least an informal network that could help them with an array of important but technical tasks of preparing education-centered materials. This could include the identification of common core academic and concentration curriculum and instructional materials that would

promote integrated learning opportunities. These networks should include representatives of the career guidance and counseling organizations in order to improve the quality of career pathway and standards information for students and job seekers. Such a network could also help develop distance learning services.

The legislation charges the NSSB with the responsibility to "encourage the development and adoption of curricula and training materials . . . that provide for structured work experiences and related study programs leading to progressive levels of professional and technical certification and postsecondary education" (National Skill Standards Act, Sec 504 (c) (5)). To be successful this means the work must go far beyond the fiscal resources available from the NSSB. Experience from the last five years does not indicate that industry will willingly step up to the plate to pay for curriculum development work; therefore some form of national consortia that has roots in education but with an industry identity appears to be an important model to pursue.

Timing Dilemma

It has already been noted that the development of a standards driven education system has been neither linear nor always logical. The legislative time clock is part of the equation; the NSSB legislation must be renewed in 1999 and STWOA sunsets in the year 2001. Meanwhile states are continuing to move forward in the development of their own state based standards systems. This generates a substantial timing dilemma for the NSSB.

Unless there is established some form of endorsement for standards that have already been developed, experience strongly suggests that it is not possible for any standards to be endorsed and credentials issued, even from the first three sectors, until after the turn of the century. The normal lead time for selecting, validating, and establishing assessment tools is minimally three years based on the experience of the 22 national pilot projects and long standing credentialing programs. However, this does not mean issuance of state based certificates based upon nationally validated standards will not occur. A large number of states are using skill standards developed by the pilot projects and others to develop programs of study and credentials. Clearly some interim steps are desirable.

Type of Standards Endorsed

The current NSSB plans call for the Board to only endorse core and concentration standards within an economic sector with the voluntary partnership organizations then being responsible for endorsing the specialty credentials. These plans may be modified as experience is gained but as of this writing this is the planned approach. A better approach would be to recognize specialty standards on an interim basis. The criteria for endorsing such standards could clearly indicate the temporary nature of endorsements. This approach does not ignore the need for focusing on academic and generic workplace basic standards. To the contrary, these must become a part of all education programs. This is beginning to become more common place.

NSSB should encourage such efforts within the education enterprise but always recognizing the limits of what can be done through their charter.

There are substantial reasons for developing interim criteria to recognize specialty standards. First, it makes sense to build upon what exists and there are several quality programs and organizations that need to become a part of the national voluntary standards system. Second many of them will be updating standards in the near term and with NSSB "interim criteria" could help guide such work. Third, it can build a stronger knowledge base regarding effective practices. Fourth, it can expand the involvement of the education enterprise's by helping to develop tools to aide in the development of programs of study and contextual learning materials. Finally, there is much to be gained from continuing to draw upon the already made substantial public and private investments.

The plan to develop standards from the general to the specific for the purposes of recognizing only core and concentration standards by the NSSB generates several challenges. Clearly one issue is that no sector has begun to identify core or concentration standards. (The health care pilot project has done perhaps the most work in this regard but they were able to draw upon the a well established body of specialty standards) Another issue is that experience of pilots counsels that standards are best built from the specialties inward to the core competencies as this approach eliminates guess work regarding the essential core competencies beyond the workplace basic ones already discussed. Yet another issue is that many standards that have been developed by both the pilot projects and many well established certification organizations are not in alignment with the current 16 sectors (recall that 10 of the pilot projects standards cross more than one of these economic sectors). The use of terminology is another issue several projects believed they were developing core standards materials but were unsure of the proposed NSSB dividing lines between core, concentration, and specialty.

The federal agencies could work with the organizations involved in providing specialty credentials in a variety of ways. Those interested in developing better career pathway information for career guidance and job placement services could work with an array of standards based groups to incorporate the current information into their materials. By working through a variety of the state and local consortia organizations the federal government could help promote standards based programs of study guidelines. (This could include organizations not involved with just the three economic sectors targeted for establishment of Partnerships).

State Leadership Role

Though not required in the federal legislation a special connection needs to be made between the states and NSSB efforts. Our nation's size, diversity, and form of governance dictates the NSSB will not be successful unless there is a set of mechanisms established between the work of the national voluntary partnership bodies and the vast network of education and training providers throughout the country. Also, the national effort will be fraught with frustration unless the key education policy making bodies in the nation become a part of the national

network to develop and use skill standards as a part of the mortar in the workforce development system. These realities lead to the door of state government; this tier of government is the only level positioned to provide the "walking legs" to make the NSSB vision become alive.

There is mutual self-interest that exists between the whole of state government and a federally supported but voluntary national skill standards system. This mutual self-interest includes:

- ✓ building industry networks to maximize employers' involvement in the process and use of standards;
- ✓ promoting portability of credentials; and,
- ✓ minimizing cost.

A single point of contact organization in a state (ala a skill standards board or panel) can do much to achieve coherence in promotion of a standards driven education system. Many states already have established an organization that includes several stakeholders groups to help guide the development and implementation of academic standards. There is a need to develop a counterpart organization which has similar but different functions to help implement the occupational portion of the standards system. Essential tasks of such a panel would include establishing priorities within occupational/industry sectors, reviewing available standards from national and other state sources, working with other states and national organizations in occupations where no standards exist for a high priority industry, establishing processes to review curriculum, marketing, and establishing an assessment system for use in schools and by industry. The assessment component should be geared to promoting portable credentials across state lines.

The following represents some suggested operating principles for such an organization:

- ✓ Work of the panel must be useful for K-12, postsecondary, training institutions, industrial attraction efforts, etc.
- ✓ Skill credentials should become a part of credit awards processes within the formal education system.
- ✓ Standards should only be recognized if sanctioned by an industry group(s) and/or if a national industry group exists that has NSSB recognition.
- ✓ Assessments should include performance and third party verification.
- ✓ Standards, assessments, and credentials should be built with portability
- ✓ The panel should operate through joint governing task forces and shared staff work from the several agencies involved in the state's workforce development system.

A panel could serve as the state's single point of contact regarding skill standards; to coordinate within the state; and to serve as the eyes and ears for the state outside the state's borders. Within the state, the coordination role will likewise promote efficiencies and wide adoption. It is probable that as the system evolves, various state agencies will be asked to

assume specific tasks that would support the single point of contact function. The single point of contact principle within the state implies collaboration not control. Without some mechanism such as this in the states, a national voluntary system will wane.

Business Leadership Challenges

This paper has focused on some internal issues of the education enterprise as it relates to building a standards driven system. Yet it is not possible to ignore the central role and influence industry must play to assure any hope of success. As noted earlier, some national industry leaders have centered their attention on improving the academic standards. This is understandable from their individual perspectives as each is a busy CEO of some of the largest corporations in the world. They can only do so much. But it cannot be the whole story. While business leaders may want to send a common and clear message to education policy makers that a standards driven education system is essential the fact is the message is still murky. The message is not yet coming through "standards language."

There are many employers who have devoted substantial time and attention to the development of skill standards. Evidence suggests many have become "true believers" of the value of the standards. Not all of the employers involved in the pilot projects are ready yet to support credentials (mostly due to the fear of federal intrusion) but most have found the standards to be important tools to communicate their needs to their education suppliers. These employers did not stop with "just academics," they centered attention on the full range of knowledge and skill requirements.

Perhaps a mini-summit is in order. The backers of Achieve in concert with the business leadership who were tapped by the skill standards pilot projects and the industry trade associations who have long been involved with credentialing services and the pilot skill standards projects need to come together to clarify messages. A bridge must be built between the different voices in the business community. Perhaps using the same standards language would help build that bridge.

FINAL THOUGHTS

This paper began with a quotation that captures a lofty concept but in the context of day-to-day world responsibilities. This paper attempts to keep a focus on why a standards driven education system can help all learners achieve and be productive members of society -- the lofty purpose. Yet it addresses several streams of technical issues. The technical issues discussed in this paper, and others, are all "inside the black box" that make up the inner workings of the education and training system in our country. They are the day-to-day realities. The paper has sought to provide recommendations based upon the most cost-effective ways to find solutions to promote the effort. This cost-effective criteria has lead to multiple recommendations that requires new and different forms of collaboration, a chancy proposition at best. Yet, there really is no choice. The strands must be pulled together.

ATTACHMENT A
LISTING AND CATEGORIES OF PILOT PROJECTS

Industry Sponsoring	Federal Department
Advanced High Performance Manufacturing	Education
Agricultural Biotechnology	Education
Air-conditioning, Heating, and Refrigeration	Education
Automobile, Autobody, Medium/Heavy Truck Technician	Education
Chemical Process	Education
Computer Aided Drafting and Design	Education
Electrical Construction	Labor
Electronics	Education
Electronics	Labor
Grocery	Education
Hazardous Materials Management Technology	Education
Health Care	Education
Heavy Highway/ Construction & Environmental Remediation	Education
Hospitality and Tourism	Labor
Human Services	Education
Industrial Laundry	Labor
Metalworking	Labor
Photonics	Education
Printing	Education
Retail Trade	Labor
Welding	Education

TYPES OF SPONSORING ORGANIZATIONS

Industry Association
National Retail Federation (NRF)
Electronic Industries Foundation (EIF)
Grocers Research and Education Foundation (GREF)
American Electronics Association (AEA)
Uniform Textile and Services Association (UTSA)

Consortia of Associations
Council on Hotel Restaurant and Institutional Education (CHRIE)
Graphic Arts Technical Foundation(GATF)
National Tooling and Machining Association (NTMA)
National Coalition for Advanced Manufacturing/Foundation of Industrial Modernization, Advanced Manufacturing and CADD (NCFAMAM, NCFAMCD)
National Automotive Technicians Education Foundation (NATEF)

Consortia of State and Student Organizations
National FFA Foundation (FFA)
Vocational Technical Consortium of the States (VTECS)

Applied Research & Development Organizations
Center for Occupational Research and Development, Photonics and Hazardous Material Management (CORDPh, CORDHm)
Education Development Center (EDC)
Far West Laboratories for Educational Research and Development (FarWst)
Human Services Research Institute (HSRI)

Apprenticeships
Laborers/AGC Education and Training Funds (LabAGC)
National Electrical Contractors Association (NECA)

Professional Societies
American Welding Society (AWS)
American Chemical Society (ACS)

ATTACHMENT B
NSSB PROPOSED ECONOMIC SECTORS

- Agricultural Production and Natural Resource Management
- Mining and Extraction Operations
- Construction Operations
- Manufacturing, Installation and Repair
- Energy and Utilities Operation
- Transportation Operations
- Communications
- Wholesale/Retail Sales
- Hospitality and Tourism Services
- Financial Services
- Health and Social Services
- Education and Training Services
- Public Administration, Legal and Protective Services
- Business and Administrative Services
- Property Management and Building Maintenance Services
- Research, Development and Technical Services

The Board will begin its work with three of these sectors: Manufacturing, Installation and Repair; Wholesale/Retail Sales; and, Business and Administrative Services (together these three sectors employ roughly half of all front-line workers). The NSSB will collaborate closely with the voluntary partnerships, learn from their experience in these three sectors, and use the lessons learned to improve the national skill standards system.

ATTACHMENT C
CLUSTERING HIERARCHY FOR NOICC NATIONAL UNITS OF ANALYSIS: SUPERCLUSTERS/BROAD GROUPS/UNITS

01 - CREATIVE ARTS

01-01 Fine and Performance Art Group:

2790 - Arts and Crafts
2800 - Dance
2810 - Photography
2830 - Dramatic Arts (Theater/Video/Film)
2840 - Music

S19 - Miscellaneous Arts Programs

01-02 Design Group:

2140 - Design
2385 - Interior Design

02 - ENGINEERING/TECHNOLOGY

02-03 Architecture Group:

1020 - Architecture
1040 - Landscape Architecture (?)

02-04 Engineering Group:

1110-All Other Engineering
1111-Agricultural Engineering
1112-Naval Architecture and Marine Engineering
1120-Aeronautical/Astronautical Engineering
1130-MetallurgicaL Ceramic, and Materials Engineering
1140-Chemical Engineering
1150-Civil Engineering
1160-Electrical/Electronic Engineering
1170-Industrial Engineering
1180-Mechanical Engineering
1190-Mining Engineering
1200-Nuclear Engineering
1210-Petroleum Engineering

2-05 Engineering Technology Group:

1220 All Other Engineering Technology
1221-Industrial Engineering Technology
1222-Mechanical Engineering Technology
1223-Petroleum Engineering Technology
1230-Electrical/Electronic/Electro-mechanical Technology
1260-Surveying
1480-Communications Electronics
1530-Drafting

2250-Communications Technologies
2350-Civil Engineering Technology
2390-Mining Technology

S09-Miscellaneous Engineering Related Technologies Programs

03 - MECHANICS/REPAIR

03-06 Appliance/Light Equipment/Instrument Repair Group:

1240 - Instrument Repair
1250 - Air Conditioning/Heating Installation/Repair
1460 - Appliance/Equipment Repair
1470 - Computer/Business Machine Production/Repair
1490 - Musical Instrument Repair
1500 - Jewelry and Watch Repair

2360 - Medical Equipment Repair
2600 - Building Maintenance

S16 - Miscellaneous Mechanics and Repairers Programs

03-07 Engine and Heavy Equipment Repair Group:

1510 - Automobile Mechanics
1520 - Aircraft Mechanics

2020 - Agricultural Mechanics
2610 - Heavy Equipment Repair
2620 - Industrial Machinery Repair
2640 - Automobile Body Repair
2650 - Diesel Engine Repair
2660 - Small Engine Repair
2670 - Bicycle Repair
2780 - Marine Maintenance/Repair

03-08 Utility System Operation Group:

2370 - Water and Waste Treatment
2630 - Power Plant Operation

04 - CONSTRUCTION

04-09 Construction Group:

1410 - Bricklaying
1420 - Carpentry
1430 - Electrical Power
1440 - General Construction
1441 - Painting/Paperhanging
1450 - Plumbing

2750 - Construction Equipment Operation

D05 - Miscellaneous Construction Workers

05 - PRODUCTION

05-10 Printing/Publishing Group

2240 - Photographic Processing
2680 - Printing
2681 - Typesetting and Composing
2682 - Lithography and Platemaking
2683 - Printing Press Operation
2684 - Desktop Publishing Equipment Operation

05-11 Metal Production/Processing Group:

1540 - Welding

2710 - Metal Machining
2711 - Tool and Die Making
2720 - Metal Fabrication

05-12 Other Production Group:

1632-Orthotics/Prosthetics
1682-Optical Technology

2380-Quality Control/Inspection
2420-Clothing Production
2430-Tailoring
2450-Home Furnishings
2690-Upholstering

PRODUCTION, CON'T

2700-Leather Work, Shoemaking and Repair
2730-Woodworking
2970-Line Supervision

D06-Miscellaneous Machine Operators

D07-Miscellaneous Hand Working Occupations

S17-Miscellaneous Precision Production Programs

06 - TRANSPORTATION

06-13 Land Transportation Group:

2760 - Truck and Bus Driving

D08 - Miscellaneous Transportation Workers

06-14 Air and Sea Transportation Group:

1550 - Airplane Piloting
1560 - Air Traffic Control

2770 - Water Transportation

07 - SCIENCE AND QUANTITATIVE RESEARCH

07-15 Natural Sciences/Technology Group:

1310-Biological/Life Science
1311-Medical Science
1330-Physics/Astronomy
1340-Atmospheric/Space Science
1350-Chemistry
1360-Earth Science
1370-Chemical Technology

2540-Science Technologies
2541-Biological and Agricultural Technology
2542-Nuclear Technology

Undergraduate Life Sciences, General
Undergraduate Physical Sciences

07-16 Quantitative Research Group:

2490 - Mathematics
2491 - Actuarial Science
2500 - Quantitative Business Research

07-17 Computer Systems Group:

2260 - Computer Systems

07-18 Social Science Group:

1030 - Urban/Regional Planning
1400 - Economics

2590 - Social Science

S03 - Undergraduate Social Sciences
S04 - Area Studies

08 - NATURAL RESOURCES/AGRICULTURE

08-19 Natural Resources/Agriculture

2010-Farming
2030-Fish and Wildlife Management
2040-Food Processing/Production
2050-Agricultural Services and Supplies
2051-Animal Training
2060-Garden and Landscaping Services
2070-Agricultural Food Sciences
2080-Forest and Conservation Work
2090-Forestry and Conservation Science
2100-Timber (Harvesting)

S01-Undergraduate Agricultural Sciences

09 - HEALTH CARE/MEDICINE

09-20 Health Diagnosis and Treatment Group:

1570-All Other Health Diagnosis and Treatment
1580-Speech Pathology/Audiology
1590-Dentistry
1670-Physician Assisting
1740-Medicine
1750-Nursing
1770-Optometry
1790-Podiatry
1840-Veterinary Medicine

S21-Pre-Medical Programs

09-21 Health Technology Group:

1600-Dental Hygiene
1631-Cardiology Technology
1680-Laboratory Technology
1681-Veterinary Assisting/Technology
1690-Emergency Medical Technology
1700-Nuclear Medical Technology
1710-Radiologic Technology
1730-Surgical Technology
2880-Dental Laboratory
2920-EKG
2930-EEG

09-22 Health Therapy Group:

1640 - Occupational Therapy Assisting
1660 - Physical Therapy Assisting
1720 - Respiratory Therapy
1800 - All Other Therapy
1810 - Occupational Therapy
1820 - Physical Therapy
1830 - Recreational Therapy

09--23 Health Assisting Group:

1750 - LPN
2850 - Mental/Physical Health Assisting
2851 - Psychiatric Assisting
2852 - Nurse Assisting
2853 - Home Health Assisting
2860 - Community Health Work
2870 - Dental Assisting
2910 - Medical Assisting

09-24 All Other Health Related Group:

1630 - Miscellaneous Health Services
1650 - Pharmacy Support
1780 - Pharmacy

2940 - Optical Dispensing

S20 - Miscellaneous Health-Related Programs

10 - SOCIAL

10-25 Social Services Group:

1080 - Counseling
1380 - Psychology
1390 - Social Work
1391 - Clinical and Medical Social Work

2510 - Recreation
2520 - Religious Education
2530 - Religion

S13 - Philosophy and Religion
S15 - Undergraduate Psychology

10-26 Legal Services Group:

1280 - Legal Services
1290 - Legal Assisting

10-27 Education Group:

1060 - Educational Administration
1070 - Special Education
1090 - Elementary Education
1100 - Preschool Education

2230 - Instructional design
2320 - Teaching Assisting
2330 - Adult and Continuing Education
2340 - Secondary and Vocational Education

D02 - Miscellaneous Professional Occupations (Remove 53502)

S07 - Education

10-28 Information Collection and Dissemination Group:

1300 - Library Science
1320 - Archival Science

2210 - Communications/Journalism/Broadcasting
2480 - Library Assisting

11 - MANAGEMENT/ADMINISTRATION

11-29 Management Group:

2290 - Food Service and Lodging Management
2560 - Public Administration
2890 - Medical Services Management
2950 - Business Management and Administration
3020 - Personnel Management

D01 - Miscellaneous Management and Management Support

11-30 Finance Group:

1850 - Accounting and Financial Management

2130 - Securities Sales

12 - ADMINISTRATIVE/CLERICAL

12-31 Secretarial/Steno Group:

1620 - Stenography
1860 - Secretarial
1861 - Legal Secretary
1862 - Medical Secretary

12-32 Other Clerical Group:

1610 - Medical Records

2900 - Health Unit Coordinating
2960 - Clerical Supervision
2980 - Bookkeeping
2990 - Office Clerical
3000 - Data Entry
3010 - Banking Support Services
3030 - Computer Operation

D03 - Miscellaneous Administrative Support Occupations

13 - MARKETING/SALES

13-33 Marketing/Advertising Group:

2220 - Marketing/Advertising/Public Relations

S05 - Modeling

13-34 Sales Group:

1870-Real Estate

2110-Fashion Merchandising
2120-Sales
2150-Food marketing

2160-Purchasing
2180 Insurance
2200 - Automobile Sales/Service

14 - SERVICES

14-35 Personal Services Group:

2270 - Funeral Services

14-36 Personal Care Services:

2400 - Home Economics
2410 - Child Care
2470 - Home Assisting

S10 - Home Economics, Other

14-37 Hospitality/Travel Services:

2170 - Hospitality Services
2190 - Travel Services
2740 - Flight Attending

14-38 Cleaning Services:

2440 - Laundry and Drycleaning
2460 - Housekeeping/Building Services

14-39 Food Service Group:

2280 - Food Service
2281 - Bartending
2310 - Waiter/Waitress

14-40 Food Preparation Group:

1270 - Dietetics/Nutrition

2282 - Baking
2283 - Chef
2300 - Meatcutting and Butchering

14-41 Protective Services/Public Safety Group:

2550 - Law Enforcement
2570 - Security Services
2580 - Fire Safety

15-42 Humanities

S02 - Multi/Interdisciplinary Studies
S09 - Literature and Foreign Languages
S11 - Liberal Arts and Humanities

ATTACHMENT D
STATE CAREER MAJORS/CLUSTERS

State	Clusters
Alaska	Still being considered.
Arizona	Bioindustry Senior Living Environmental Technology Food, Fiber & Natural Products High Technology Industry Mining & Minerals Optics Software Tourism Transportation and Distribution
California	Recommended Career Paths Agriculture and Natural Resources Environmental Health Services Transportation Energy Finance Arts, Media and Entertainment Public Service and Safety Hospitality, Tourism and Recreation Retail, Wholesale and International Trade Human and Social Services Fashion and Interior Design Manufacturing Business Services Construction Engineering Information Systems-Telecommunications Education
Colorado	State Career Majors Health-related Services Art, Humanities and Communications Engineering and Industrial Technology Human Services Natural Resources Business, Marketing and Financial

State	Clusters
Connecticut	Career Clusters Arts and Media Business and Finance Construction: Technologies and Design Environmental, Natural Resources and Agriculture Government, Education and Human Services Health and Biosciences Retail, Tourism, Recreation and Entrepreneurship Technologies: Manufacturing, Communications and Repair
Florida	Florida's Top Career Clusters Health Care Services Hospitality/ Tourism/Entertainment Information and Telecommunications Construction Related Human and Social Services Finance and Insurance
Hawaii	Health Services Business Management Technology Natural Resources Human Resources
Idaho	Arts and Communications Business and Management Health Services Human Resources Industrial and Engineering Natural Resources
Indiana	Electronics Business support services Metalworking Printing Health Plastics manufacturing Advanced industrial manufacturing Bioscience Technology
Iowa	Career pathways to be determined with the assistance of the Association of Business and Industry

State	Clusters
Kentucky	Career Clusters Agriculture Arts and Humanities Business and Marketing Communications Construction Education Health Human Services Manufacturing Mining Public Services Science and Mathematics Social Sciences Transportation
Louisiana	Business & Marketing Engineering/Industry/Technology Health/Human Services Humanities/The Arts
Maine	Arts and Entertainment Science and Research Agriculture and Natural Resources Law Enforcement and Security Mechanics and Engineering Industry and Manufacturing Business Operations and Management Sales and Promotion Customer and Personal Services Health and Human Services Education and Public Administration Sports and Physical Performances

State	Clusters
Maryland	Consumer service Hospitality and Tourism Business Management and Finance Human Resource Services Manufacturing, Engineering and Technology Construction and Development Health and Bioscience Arts, Media and Communications Environmental and Natural Resources Systems Transportation Technologies
Massa- chusetts	Health care and Health Service Financial Services Metalworking Biotechnology Environmental Technology Instruments and Precision Manufacturing Fiber Optics, Telecommunications and Information Technology Advanced Materials and Composite Technology Travel and Tourism Marine Science Business Services
Michigan	Business Services Technology Child and Adult Care Public Safety/ Protective Services Manufacturing Technology, AgriScience and Natural Resources Construction and Building Maintenance, Transportation (NATAF)/ Automotive and Medium/Heavy Trucks Marketing Visual Imaging Technology, Electro Mechanical, Drafting/Design Hospitality Health

State	Clusters
Minnesota	Career Clusters Manufacturing Hospitality/Tourism Media Communications Electronics Human Services Transportation Business/Office Occupations Small Business/Self Employment Agriculture/Environmental Printing/Graphic Design Health Professions/Related Sciences Maintenance Sales/Marketing Finance Construction
Missouri	Career Paths Arts & Communications Business, Management and Technology Health Services Human Services Industrial & Engineering Technology Natural Resources/Agriculture
Nebraska	Industry Clusters Agricultural/Food Processing Natural Resources Business Information/Computer Technology Electrical Communications Technology Plastics/Rubber Metal Fabrication Instrumentation Production Industry Technology
Nevada	Career Pathways Arts and Communication Business and Management Health Services Human Resource Services Natural Resources Information and Industrial Technology

State	Clusters
New Hampshire	Career Clusters Health & Human Services Business Services & Commerce Engineering, Manufacturing and Technology Natural Resources Arts, Humanities, and Communications
New Jersey	None listed
New Mexico	
New York	Career Majors Business/Information Systems Health Services Engineering/Technologies Human and Public Services Natural and Agricultural Sciences Arts/Humanities
North Carolina	Arts & Humanities Biotechnology Business & Marketing Construction Technology Electronics Engineering Technology Environmental Sciences Health & Medical Manufacturing Technology Human Services Telecommunications Travel & Tourism/Hospitality
Ohio	Career clusters and career majors are still being considered. Arts and Communications Business and Management Health service Human resource Industrial and Engineering Systems Environmental and Agricultural Systems

State	Clusters
Oklahoma	Career Clusters for Plans of Study Agriculture Business Construction Design, Communication & Art Education Health Manufacturing Personal Service Repairers & Mechanics Sales & Marketing Science & Technical Social Science Transportation
Oregon	Certificate of Advanced Mastery Endorsement Areas Arts and Communications Business and Management Health Services Human Resources Industrial and Engineering Systems Natural Resource Systems
Pennsylvania	Agriculture/Natural Resources Transportation Engineering Consumer Services Construction Mechanics/Repairers Production Industries Communications Health Care Business/Information Processing
Rhode Island	
Tennessee	Health Care Arts/Communication Science/Technology Human Services Business/Marketing Hospitality/Tourism Manufacturing/Construction/Transportation.

State	Clusters
Texas	Career Pathways from Perkins application Agricultural Science and Technology Arts, Communications, and Media Technology Business and Marketing Health Science Technology Human Development, Management and Services Industrial and Engineering Technology Personal and Protective Services
Utah	Career Fields Scientific (Engineering/Agriculture/Earth/Natural Resources/Medical) Social-Humanitarian (Protective Services/Education/Government) Business-Marketing (Sales/Management/Supervision) Business-Information (Administrative Detail/Financial Detail) Artistic (Visual/Performing/Literacy) Technical (Transportation/Construction Services/Equipment Operation and Repair, Communication/Manufacturing)
Vermont	Not developed
Washington	Determined at the local level
West Virginia	Health/Human Services Business/Marketing Science/Natural Resources Engineering/Technical Fine Arts/Humanities

State	Clusters
Wisconsin	Printing Finance Auto Technology Auto Collusion Health Manufacturing Machining Manufacturing Production Technician Biotechnology Drafting and design Engineering Drafting and design Architecture Drafting and design mechanical design Hotels/motel Insurance Tourism Business Marketing Food Service Agri-science Childcare

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U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement (OERI)
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