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ABSTRACT

The key issues, alternatives, and implications for developing countries to consider when designing systems to define occupational standards, related training standards, and assessments were analyzed. The analysis focused on the following issues: the rationale for development of standards; clarification of definitions, terminology, and assumptions; improvement of stakeholder involvement; analysis of labor market information; development of occupational standards; assessment of occupational standards; linkage of occupational standards with training standards; and governance, financing, and administration of national standards systems. The following were among the key recommendations regarding developing occupational and training standards: (1) although the process of developing standards may be initiated at the local level, some national leadership is needed once pilots have been completed and resources are available; (2) development of demand- and output-driven standards hinges on formal involvement of employers, professional associations, and labor representatives from the outset; (3) multiple sources of labor market information are required; and (4) leadership for linking occupational and

training standards can reside with training institutions. (The following items are appended: overviews of the processes of defining occupational standards and linking occupational and training standards; sample occupational standards legislation; and a summary of selected standards systems in 10 countries. The bibliography lists 22 references.) (MN)

A Framework for Defining and Assessing Occupational and Training Standards in Developing Countries

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Foreword

The World Bank Human Development Network, the European Union (EU) European Training Foundation, and the Educational Resources Information Center Clearinghouse on Adult, Career, and Vocational Education (ERIC/ACVE)[1] cooperated in the development, financing, and publication of this paper. The paper was developed to respond to needs expressed by human resource development practitioners in developed and developing countries for more information on issues related to development of occupational and training standards. The ERIC/ACVE Clearinghouse, which is 1 of 16 clearinghouses in a national information system that is funded by the Office of Educational Research and Improvement (OERI), U.S. Department of Education, played a key role in the publication process in order to fulfil one of its functions—interpreting the literature in the ERIC database. This paper should be of interest to education, training, and labor market practitioners and graduate students in career and technical education and work force development.

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[1]Note: The findings, interpretations, and conclusions expressed in this paper should not be attributed in any manner to the Ohio State University, the EU European Training Foundation, the World Bank, affiliated organizations, or to members of its Board of Directors or the countries they represent, nor to other sponsoring institutions or to ministries or employment organizations in the participating countries. Opinions expressed are those of the authors who also bear responsibility for any errors.

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Occupational and training standards have economic and social outcomes and benefits. The link between human capital investment and productivity is well documented in what is an increasing technological workplace, as are the linkages between the level of education and training, employment, wages, poverty, social inclusion, and cohesion. Individuals with low educational levels need opportunities to improve their human capital if they are to improve wages and their economic status and be able to engage more fully in civil society.

Developing countries face a number of challenges, compared to developed countries, in designing national occupational and training standards and related assessment systems. Developing countries need to select alternatives that are appropriate for local conditions and that reflect the availability of resources to sustain the systems. A country may decide to start with pilot activities at the local level in high-priority occupations and sectors, then move to a national approach. Continued local development may lead to fragmentation and duplication and may not promote internal and external labor mobility. Some national leadership is needed.

Stakeholders—including employers, professional associations, labor, and education and training institution representatives—need to be involved. Employer participation is critical to ensure that the process is demand and output driven. Employer participation may be difficult to maintain, particularly in countries where the informal and small business sector dominates. Multiple sources of labor market information should be used to help define priorities for standards development. Medium-term qualitative employer surveys can provide economic and employment information in countries where other sources of data are not available.

Occupational standards, or *employment specifications*, must be defined by employers following procedures agreed upon by all stakeholders. Several approaches are used for development of these standards, and a country is advised to review each before beginning the process. Developing countries should obtain occupational standards from other developed and developing countries for benchmarking purposes. A country may want to adapt selected standards for internal use, particularly those which are international in scope, to save resources, facilitate labor mobility, and promote inward investment. Assessments, *or performance specifications*, are used to evaluate and document what an individual can do as a result of formal or informal training. Training standards, *or learning specifications*, are used to define curricula in training institutions. Leadership for design of assessments and training standards can be from the training sector but the content must be based on occupational standards. These linkages are often weak in developing countries.

If a country decides to embark on development of national standards, stakeholder involvement must be formalized early in the process. Countries that embark on national standards development need a long-term view as national systems can take 3-5 years to develop before they have an impact on employment and training. Development should be prioritized to get the maximum benefit from resources. Financing must be available for development and recurrent expenses to ensure sustainability. Stakeholders should each

contribute resources. Careful thought must be given to the selection of staff and the institution that will host the national system, to ensure credibility of the products and continued stakeholder support. Good dissemination of public information is needed to get standards products understood and used by stakeholders. Finally, although standards are necessary they are insufficient to ensure high-quality formal training. Well-trained instructors, supporting materials, and equipment are also essential elements of the training process.

Information on the topics in this paper may be found in the ERIC database using the following descriptors: *Developing Nations, Employment Statistics, Job Analysis, *Job Training, Labor Market, National Standards, *Occupational Information, *Standards. Asterisks indicate descriptors that are particularly relevant.

Introduction

The goal of this paper is to provide an overview of key issues, alternatives, and implications for developing countries[1] to consider when designing systems to define occupational standards (OS), related training standards (TS), and assessments. In this paper OS are defined as the duties that must be performed by a person to function successfully in an occupation. The paper is designed to be used by employment, education, and training policy makers and technical staff in developing countries and in development agencies. The authors have focused, to the degree possible, on issues and experiences in implementing standards and assessments in developing, as opposed to developed, countries. However, the paper also draws on the experience of the Organization for Economic Cooperation and Development (OECD) for the lessons learned there.

The paper is organized around the following issues:

- The rationale for development of standards
- Clarification of definitions, terminology, and assumptions
- Improvement of stakeholder involvement
- Analysis of labor market information
- Development of occupational standards
- Assessment of occupational standards
- Linkage of occupational standards with training standards
- Governance, financing, and administration of national standards systems

One of the basic decisions that countries must make when contemplating development of standards is whether to (1) limit development to sensitizing local stakeholders to the importance of occupational and training standards and providing them with information on appropriate methodologies to develop *local standards;* or (2) embark on a more ambitious program to develop a system of *national standards*. The former does not preclude moving toward the latter at a subsequent time. The former is also an important step in developing and maintaining the latter. With this linkage and objective in mind, most vocational teacher training programs in developed countries include training in development of occupational and vocational training standards as a part of preservice education.

Some developing countries may decide to encourage development of local standards and not to move forward with development of national standards. There can be multiple reasons for this, including, but not limited to, a lack of resources and stakeholder commitment to move forward at the national level, unfamiliarity with the techniques involved in setting up a national system and the need to undertake pilot work, and a strong formal export sector in one region that may want to move forward ahead of national development. If a local approach is taken, the ramifications of this decision should be discussed because this involves encouraging individual education and training institutions to work with employers to develop standards and programs that fit local needs. This

[1] For purposes of this paper developing countries are understood to include both middle- and lower-income countries as classified by the World Bank for receipt of financing by the International Bank for Reconstruction and Development or the International Development Association respectively.

scenario may be less costly at the outset and appropriate in less-developed countries with limited resources, large informal sectors, and weak or absent stakeholders. However, such an approach has drawbacks, including duplication of development costs, lack of portability of skills within and between countries, a potential negative impact on internal and external labor mobility, and a potential for fragmented and poorly articulated training programs. The following pages outline topics that need to be considered under both local and national approaches with pros and cons of both approaches. The final chapter of the paper, which addresses governance, financing, and administration, is primarily focused on development of national standards.

Rationale for Developing Occupational Standards

Occupational standards and related training standards and assessments are an essential link between *workplace employment requirements* and *human capital development* (i.e., education and training programs) that affect individual citizens throughout their life span. Occupational standards can make a major contribution to the design of high-quality education and training programs by ensuring they are directly linked to the needs of the workplace and overall economy. Standards have both *economic and social outcomes*.

Economic Outcomes

On the economic front, the link between human capital investment and productivity is well documented in what is an increasingly technological workplace. The growing international nature of production, trade, and labor is exemplified by the emergence of Economic and Employment Strategies of the European Union (EU), the North American Free Trade Agreement (NAFTA), the General Agreement on Tariffs and Trade (GATT), and the MERCOSUR[1] agreements. These initiatives and the adoption of ISO 9000 standards for quality documentation are examples of trends that have strong implications for productivity (Oliveira 1995). Occupational standards have similar implications for development of human capital. The results of studies in developing countries indicate that, if they wish to increase efficiency, they should try to get access to best-practice technology. And, irrespective of the source from which technology is acquired, firm investments in worker training, particularly for skilled workers, are very important to improving average efficiency levels (Tan 1995).

Developed and developing countries recognize these economic benefits. Many countries have taken specific steps to develop occupational and training standards, and some are beginning to develop cross-national approaches and benchmark national standards to international requirements. Many nations, for several years, have been moving from a fragmented to a more coordinated system of standards (Vikers 1994). During the past few years the trend has intensified in such countries as Australia, New Zealand, Canada, Denmark, Germany, Japan, the Netherlands, United Kingdom, and the United States. Similar initiatives are underway in developing countries, particularly middle-income countries, as exemplified by the emergence of formal standards programs in a diverse range of countries including Chile and Malaysia (Lythe 1997) as well as Romania, Philippines, and Turkey (see Appendix 4 for a summary of selected standards systems). Experience in developing countries shows that, in addition to addressing economic and social issues, definition of standards can open up previously underdeveloped areas for reform. These include assessment and recognition of prior learning, more flexible and relevant training, and encouragement of a broader range of stakeholder involvement in human capital development.

[1]MERCOSUR is the Mercado Común del Sur (Southern Common Market), formed in 1994 by Argentina, Brazil, Uruguay, and Paraguay.

Social Outcomes

Social benefits also emanate from occupational and training standards. The linkages between the level of education and training, employment, wages, poverty, social inclusion, and cohesion are generally recognized. Individuals with low educational levels need opportunities to improve their human capital if they are to improve wages, move up the economic ladder, and by inference be able to engage more fully in civil society. National standards can assist by improving the quality of education and training programs and the articulation between programs, as well as by providing for recognition of nonformal and on-the-job skill development. These activities can also facilitate lifelong learning (OECD 2000).

Challenges and Limitations

Although there are economic and social rationales for standards, developing countries are faced with several unique challenges, when compared with developed countries, in establishing standards.

Investment Costs

Recent experience in middle-income countries such as Romania and Turkey indicates that investments of close to US $2 million are necessary to initiate a sustainable system of standards and produce a substantive core of high-priority national occupational standards and assessment instruments. This can take a minimum of 3-5 years. The ninth chapter of this paper provides a more complete discussion of the governance, financing, and administration of standards systems.

In resource-constrained environments an alternative may be to develop standards only at the local level or to start by developing national standards in selected high-priority areas. The advantage of this approach is it provides an opportunity to refine procedures with lower initial investments. However, this approach may discourage stakeholders from joining the effort, particularly if their interests are given a low priority, and may encourage fragmentation in standards development between sectors. This can be detrimental to the very concept of standards, which are intended to encourage occupational mobility within and between sectors.

Informal Sector

Less-developed countries often have a large informal sector, frequently based on rural subsistence agriculture and micro-enterprises. This is a difficult environment in which to develop and use standards, which tend to address modern, formal-sector labor force issues. This does not mean that standards should not be developed, but special efforts will be needed to identify high-priority occupations that can assist the productivity of, and employment in, small and medium-scale enterprises (SMEs) as well as in the larger formal sector. SMEs, particularly those in the informal sector, are often not well organized

and obtaining input from them is difficult. This may not be altogether due to lack of interest from SMEs. SMEs have more difficulty in releasing key staff who may be critical to daily operations, and SMEs may be family run and members may not be willing to share information with outsiders.

International Standards

Developing countries need to determine if they want to develop their own standards on what may be outdated enterprise and employment practices, or adopt or adapt other national or international standards, particularly for modern formal sector occupations. The former approach may slow development, but the latter has the chance of establishing standards that may be more forward looking and support both international investment and labor mobility between neighboring countries. Several factors affect decisions in this area. First, if stakeholders are to internalize and use standards, it is critical that they be involved in the development process; therefore, adapting is preferable to adopting. Second, even if stakeholders decide to develop their own standards and assessment procedures, they generally want to be able to compare both the process and output to international benchmarks to ensure portability of their standards and labor. Third, there may be some technical occupations in which inward investment is largely dependent on specific human capital (i.e., information technology occupations), or professional skill requirements are defined internationally (i.e., aircraft pilot, certified accountant). If so, there is a rationale for considering the adaptation of international standards.

Definitions, Terminology, and Assumptions

If a country is going to develop standards, there needs to be agreement on the definition of an occupation, as well as other related terms. These seemingly minor questions cause many technical problems. Most countries have national classifications, and many of these are linked to or are an adaptation of one of the international classifications such as the International Labour Organization's (ILO) International Standard Classification of Occupations (ISCO) and the United Nations Industrial Development Organization's (UNIDO) International Standard Classification of Industries (ISCI). If definitions are not agreed upon or do not reflect the current state of the economy and labor market, the development of standards will be in a weak position at the outset. There is also a need to link occupational and education/training classification systems and detailed occupational standards (chapter eight presents a more detailed discussion of the latter).

Job versus Occupation

Webster's dictionary defines an occupation as "*the principal business of one's life*" whereas a job is "*hire for a given service or period.*" Although this definition of an occupation is perhaps a little outdated in the current changing economy, the essential point is valid. An occupation is a more general concept than a job. Occupational standards need to be developed around occupations and not jobs, which are time bound and tied to individual employers. Occupational standards organizations should take the following actions:

- Adopt a pragmatic approach to defining occupations based on international and local practices as agreed with stakeholders, and not force the use of inappropriate and outdated classification systems.

- Recognize the clear difference between an *occupational description* (which is a brief general statement describing an occupation) and an *occupational standard* (which is a more detailed listing of all major activities that a worker must perform in the occupation).

- Reconcile the use of different classification systems in the country (i.e., between census, employment service, central statistical office, and career counseling systems). This can be accomplished by adopting one system or creating "crosswalks" to allow rapid transfer of information between systems, as has been done in the United States.

Definitions

In Romania, the existing occupational classification had to be updated extensively in early 1990, including building linkages with the Central Statistical Office, the new National Employment and Training Agency, the Career Counseling and Information System, and the Council for Occupational Standards and Assessment. In the United States, the Dictionary of Occupational Titles (DOT) has about 17,500 job titles, but the Standard Occupational Classification (SOC), which is similar to the International Standard Classification of Occupations (ISCO), has about 1,200 occupational titles. In addition, there were different occupational classifications for occupational surveys used by the Census, as well as the Bureau of Labor Statistics. The DOT level was clearly not the place to start for OS, and the SOC has become the common denominator. In the United Kingdom, there are multiple classifications, which are pragmatically linked to National Vocational Qualifications, but which are not used to define the content and scope of the qualifications.

Occupation versus Sector

An *occupation* relates to a person and his/her role in the labor market (e.g., accountant). A *sector* defines a group of related economic entities or enterprises (e.g., financial sector, mining sector, and agricultural sector). The two terms are sometimes confused. Most occupations (i.e., accountant) occur in many sectors, but some occupations are quite sector specific (i.e., mining engineer). The critical point is that OS organizations need to define generic occupational standards that will facilitate individuals working in similar occupations in different sectors, as opposed to standards that are sector specific (i.e., analogous to a job). There are country and international classifications of sectors. The UNIDO International Standard Classification of Industries (ISCI) is often adapted by developing countries. Whichever approach is used, it is important to determine the linkage between sectors and occupations as this has ramifications for development of labor market information, OS, and worker mobility.[1]

Occupation	Sectors %					Total %
	Financial	Mining	Construction	Health Services	Other	
Accountant	30	3	2	5	60.00	100
Nurse	0.01	0.1	0.1	60	39.79	100
Mechanic	0.1	10	10	0.1	79.80	100
Stock Broker	80	-	-	-	20.00	100
Secretary	10	2	2	5	81.00	100

Figure 1. Example of occupational employment across sectors

[1] The linkage is exemplified in figures 1 and 2. Note that sample percentages are shown; however, actual data could be shown using country-specific statistical information.

Occupation	Sector %				
	Financial	Mining	Construction	Health Services	Agriculture
Accountant	20.0	3.0	2.0	5.0	2
Nurse	0.1	0.2	0.1	40.0	1
Mechanic	0.1	12.0	15.0	0.1	10
Stock Broker	50.0	-	-	-	-
Secretary	15.0	2.0	3.0	10.0	1
Other	14.8	82.8	79.9	44.9	86
Total %	100	100	100	100	100

Figure 2. Example of occupational employment within sectors

Occupational Classifications and Standards versus Education and Training Classifications and Standards

The classification systems for occupations and education/training programs are different, but linkages between the two systems must be identified when developing standards. Occupational classifications and standards are defined in terms of *the activities performed by a person in a selected occupation* (e.g., a nurse gives injections, counsels patients, discusses issues with other staff, completes daily recordkeeping, etc.). Education and training standards are developed from the activities defined in occupational standards, and they *include learning objectives to ensure that the necessary skills and knowledge* are developed by a person to enable him or her to function at an agreed level in an occupation. For example, training for nurses could include human relations and counseling skills in order to prepare them for dealing with patients and doctors, manual and hygienic training to know how to give an injection, and technical writing and computer skills to complete necessary administrative records. The sixth and eighth chapters contain a more complete discussion of this topic.

Educational institutions normally report enrollment at the course and program level using educational classification systems. Labor institutions report employment data on the occupational classification systems. These two systems must be linked. Sometimes the linkage is very direct; however, for others, the linkage is not always clear because trainers have not explicitly linked their training programs to labor market needs (i.e., occupations). For example, licensed occupations such as nursing, and related education and training programs, often have very similar titles and definitions. However, training programs and courses in information technology (IT) may prepare people for a wide array of different occupations—accountant, machine tool operator, web designer, and medical

technicians, including nurses who need some IT skills to complete administrative and professional tasks. This linkage is critical to the development and use of occupational and related training standards.

UNESCO has an International Standard Classification of Education Programs (ISCED), in contrast to the ILO's International Standard Classification of Occupations (ISCO). In the United States, the Classification of Instructional Programs (CIP) has been developed by the National Center for Education Statistics, but it is quite different from the Standard Occupational Classification and the older Dictionary of Occupational Titles (DOT) developed by the Department of Labor, which is now being replaced by the O*NET classification. The original DOT has some 60 classifications for welding occupations, but the CIP has only several classifications for welding training programs. There are simple automated "crosswalks" that allow comparison on data between the two classification systems, and the more recent O*NET classification has fewer job titles, which simplifies this process.

Assumptions and Limitations of This Paper

Discussions of occupational and training standards often incorporate a broad range of topics: identification of economic trends and labor market information (LMI), occupational standards, assessment, training standards, and curriculum development and training delivery. As depicted in figure 3, this paper starts at the LMI analysis stage, describes the process of occupational analysis, discusses approaches to assessment, and briefly discusses the linkage with training standards and curriculum, *but it does not discuss training delivery*. These limitations have been introduced in order to keep the paper focused and in recognition of the fact that much has already been written on curriculum development and training delivery, but less on the technical design of occupational standards, assessment, and linkage with training standards.

The paper is *not* a detailed, prescriptive technical "how-to manual" for guiding development of standards in a specific country. This detail needs to be developed within a country context, and it should be based on the choice of key alternatives outlined in this paper. The paper does *not* attempt to provide a comprehensive summary of what different countries are doing at present. This information is already available in multiple documents and on websites, which are referenced. Instead, the paper attempts to synthesize this experience for application in developing countries and presents a summary of selected country examples (see Appendix 4).

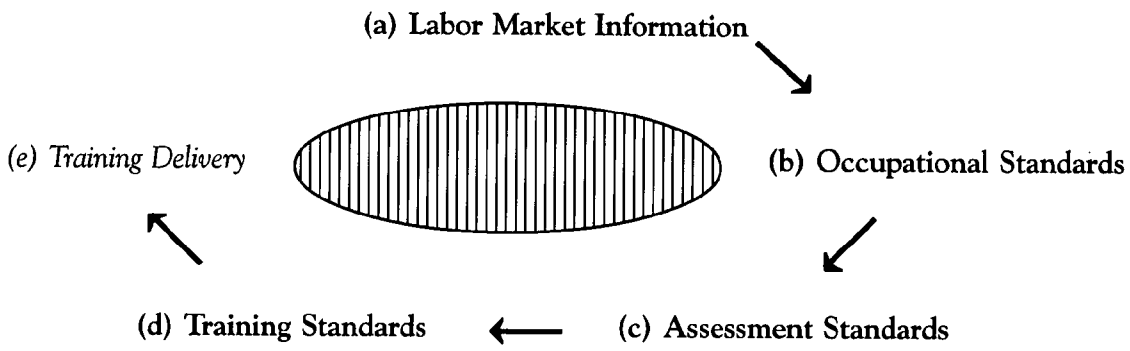


Figure 3. Steps in the development of occupational and training standards

The paper is *not* a detailed, prescriptive technical "how-to manual" for guiding development of standards in a specific country. This detail needs to be developed within a country context, and it should be based on the choice of key alternatives outlined in this paper. The paper does *not* attempt to provide a comprehensive summary of what different countries are doing at present. This information is already available in multiple documents and on websites, which are referenced. Instead, the paper attempts to synthesize this experience for application in developing countries and presents a summary of selected country examples (see Appendix 4).

Stakeholder Involvement

The involvement of a broad range of stakeholders, with leadership from employers, is critical to the success of the development of standards and in particular operating standards. The very nature and content of OS dictates that the primary input must come from employers. But this is not always the case, because employers are not often the prime movers in OS development. Leadership often emanates from public employment and training institutions, including Ministries of Labor and Education, which need OS. And, when they lead OS work there is sometimes a tendency for their representatives to shape procedures and outcomes in a manner that may not conducive to good OS development (i.e., it has a supply, rather than a demand, perspective). There needs to be a clear recognition, particularly by employers as well as other key stakeholders (government, unions, enterprises and their associations, and professional/technical associations) of the need for OS if the development process is to be successful.

Voluntary or Mandatory Standards

The way this issue is addressed may well seal the fate of development of OS. Do employers really want standards? What will be the understanding of the linkages between standards, wages, and hiring practices? What is the attitude of government toward mandatory standards? Voluntary standards will appeal to employers, who will understandably want to maintain control of recruitment and wages. Mandatory standards, on the other hand, may be preferred by some government officials who may see benefits in linking them directly with wages. Union representatives may also favor mandatory standards and want to inflate hiring standards to protect existing workers, restrict supply, and force up wages. Experience indicates that standards are accepted more positively when they are jointly developed by stakeholders and are applied voluntarily. Heavy-handed application of standards by the government will probably cause employers to withdraw from the process with related damage to the use of products from any standards development exercise.

Generating Interest and Partnerships

In order to generate interest among all stakeholders, it is necessary to show the benefits to all concerned:

- Employers must see the potential for increases in labor productivity; they want to be assured that the people they hire from training institutions are well prepared and want a better return on payroll training taxes they may be paying.

- Union members must see that standards can improve job entry and mobility for their members.

- Government training institutions and ministries must view standards as a way for their education and training programs to gain stature and improve quality, and not just lose control of course content.

If one stakeholder (e.g., the government/training institutions) tries to develop standards unilaterally, there may be resistance to development. Other key users (e.g., employers, as happened in the Philippines—see Appendix 4) may ignore any standards developed, or the standards may be looked at with suspicion. For example, small informal employers and large multinational companies may fear that government initiatives to develop occupational standards may be misguided or a guise to gain further control over their operations. Some government training institutions may also resist development of occupational standards that they may consider their private responsibility. And, if government and training institutions take the leadership for development of standards, they will likely be supply driven with associated problems. On the other hand, if employers develop them unilaterally, training institutions may criticize them as being too job specific. The best approach is one of partnership.

Special Issues in Developing Countries

Notwithstanding the need for partnerships, in some developing countries nongovernment stakeholder representatives do not exist, or if they do they may not be sufficiently mature and organized to provide input (e.g., private employer organizations, unions). The government may be the dominant institution, which is a serious limitation to development of OS. And, as mentioned earlier, if the economy is dominated by the informal sector (e.g., the number of jobs created in the informal sector is 20-30 percent in many Latin American countries and in Africa over 75 percent), there may be little chance for formal input from small employers. Large and middle-sized employers may be better organized in countries with large formal sectors. But, in many Formerly Centrally Planned Economies the major employers were state owned and were actually part of government, and private employers may not yet be well organized. Labor organizations may also be fragmented and not interested in developing standards that may be viewed as a long-term issue and not directly linked to immediate worker benefits. Professional associations may be weak and disorganized. Finally, government training institutions themselves may be in conflict. Ministries of education, labor, higher education institutions, and various sectoral ministries (e.g., agriculture, industry, and tourism in Egypt) that are involved in training may not wish to create common standards, linkages, and articulation agreements or share responsibility with other ministries, let alone other stakeholders. These situations are perhaps ones where standards are the most needed, and chapter six outlines approaches for obtaining input from stakeholders, even when representative organizations are weak.

Collateral Benefits

Development of standards can provide an opportunity for what may otherwise be competing entities to work together on issues that have long-term implications for the country and all concerned. Although standards development initiatives cannot "create"

stakeholders, there is evidence that, by entering into regular dialogue concerning development of standards, linkages between key stakeholders can be strengthened. Finally, although occupational standards are related to ISO 9000 manufacturing standards, it should be noted that industrial/engineering organizations that normally develop ISCO standards do not usually develop occupational and training standards, nor do ISCO organizations ordinarily have the expertise to do so. However, they should be included as a member of an occupational and training standards consortium. If they are not and they do not understand the process of standards development, they may regard this as their private responsibility and want to take over development with negative consequences (as almost happened in Turkey several years ago).

Labor Market Information and Analysis

Occupational standards must reflect ongoing economic and technical changes in the economy that result in changing skill demands in the labor force. Before embarking on development of OS, stakeholders need labor market information (LMI) to provide "early warning" and identify priorities for standards development in occupations that are—

- in high demand, which makes them a high priority for standard development;
- changing rapidly, meaning existing standards need updating;
- represent a large percentage of the work force and require specialized skills for their performance; and
- are in new emerging fields of work.

Analysis of LMI provides the starting point for in-depth occupational analysis and standards development. For developing countries with limited resources for development of standards, setting priorities is very important. Standards organizations *do not* normally develop first-generation LMI, but usually synthesize LMI that is available from multiple sources to define priorities. Standards organizations *do not* normally get directly involved in implementing education and training programs, and thus do not need LMI demand/supply information for the same reason as education and training institutions. The following paragraphs summarize different types of LMI that may be available to establish occupational priorities for standards development and indicate issues related to the use of LMI from varied sources. In developing economies, including transitional economies, special attention needs to be paid to monitoring developments in the small and medium-sized enterprise sector and the informal sector.

International and National Economic Trends

Although studies of economic trends do not provide specific signals in a given country for individual sectors and/or occupations, they can provide standards organizations with early warning signals of general trends in the future of demand for clusters of occupations and changes in the content of these occupations. Common threads in existing reports include globalization of trade; changes in workplace and organizational culture; changes in marketing and customer requirements; regulations that affect health and safety, finance, and environmental issues; and increasing levels of technology and telecommunications. All of these affect the content of occupations, national occupational standards, and training standards. Developing countries are affected by global changes, particularly when there is inward investment from multinationals and when they wish to compete in worldwide markets.

The biennial World Employment Report from the International Labour Organization is available in paper copy and on CD-ROM; more information on this publication and others can be obtained at *www.ilo.org*. The Organization for Economic Cooperation and Development's Employment Outlook publications can provide information on member countries. More information can be obtained on this and other publications at *www.oecd.org*. The World Development Indicators from the World Bank are available in paper copy and on CD-ROM; more information can be obtained at *www.worldbank.org*.

National Enterprise Employment Data

Most countries maintain, at least for the formal sector, employment figures on registered enterprises. Normally, this information is regularly updated for tax purposes. This type of data does not usually depict detailed occupational employment, but may provide a synopsis for managerial, skilled, and unskilled employment. Such data can give signals as to changes in overall sectoral employment, which can be translated into employment in selected occupations if the occupational structure of a sector is known (see figure 1). There are comparative tables of employment by sector in a number of countries, which OS developers can use to determine the impact of rapid changes in overall sectoral employment on specific occupations. Figure 4 gives an example of recent changes in sector employment in countries that are in transition. An issue with these data, particularly for developing countries, is that they may not accurately reflect total employment because of large informal sector activity. This is a particular issue in countries where small firms make up the bulk of employment.

Sector	Country and Percent Change in Employment			
	Czech Republic	Hungary	Poland	Slovakia
Declining Share of Employment				
Agriculture	-5.5	-3.5	-7.9	-4.2
Manufacturing	-6.0	-2.5	-1.2	-8.1
Increasing Share of Employment				
Trade and Commerce	7.8	1.1	6.7	5.1
Financial Services	1.2	2.4	2.3	0.3
Public Administration	3.3	2.5	-	3.7

Source: Barr, Nicholas, ed. ***Labor Markets and Social Policy in Central and Eastern Europe, the Transition and Beyond***. New York: Oxford University Press, 1994.

Figure 4. Changes in sector employment between 1991 and 1997

Sector Surveys

Some countries carry out irregular or regular sector surveys, including surveys in selected regions of the country. These may provide more detailed employment data by sector and include occupational categories. They may provide additional information on types of investment, particularly in technology, that have a direct impact on occupational standards. Some countries also attempt to obtain forecasts of future employment demand by asking employers to provide the information on these sector surveys. However, research has largely discredited this approach to forecasting labor demand, as employers have not demonstrated that they can forecast occupational demand other than in the short term (i.e., 3-6 months).

Census, Social Security, and Household Survey Data

Most census data has occupational information. The problem is that it is often old and replicated only about every 10 years, and people self-report their occupation. Trends between surveys need to be treated with caution, because of the long time lapse between surveys. In addition, social security pension data may provide occupational trend data, but in developing countries the majority of people may live and work in the informal sector, and thus the data will not be complete. Finally, many countries, including middle-income countries, conduct regular household surveys. These often provide a wealth of employment and unemployment data, which may give some signals for standards development. These surveys suffer from the same self-reporting problem as census data, but not from the informal/formal data problem of social security systems, because the surveys are based on a household sample frame. Some countries (e.g., Poland) use special survey modules to investigate such issues as informal and small-scale enterprise employment.

Medium-Term Employment Forecasts

Medium-term (i.e., 3-6 month) forecast information may be obtained by selecting a sample of small, medium, and large enterprises, then conducting onsite interviews to obtain general qualitative trends. Immediate reporting of information and regular replications are critical to this technique due to the rapid aging of information. The approach provides qualitative information on the labor market and economic development trends. Developed countries (e.g., Sweden, the United Kingdom, and the United States) use these surveys, as well as developing countries (e.g., Hungary, Turkey, and Poland). If these surveys are done on a regular basis, they can provide some longer-term trend data useful in setting priorities for standards development. This approach is of particular interest in developing countries, which often have rapidly changing economic conditions but lack the other types of statistical systems. The Swedish approach (Cavalli 2000) has been adapted in a number of countries, and repetitive applications have proven quite successful in Hungary (Szeleòu 1998). A related technique developed by the ILO is the "key informant system." This technique is intended for use in lesser-developed countries with high levels of informal employment in traditional cultures; it uses structured interviews

with selected individuals (i.e., key informants) at the local village level to provide information on labor trends (Mason and Richter 1985).

Employment Service Job Bank Data

When a country operates a public employment service, which all developed and most middle-income developing countries do, standards organizations have access to job vacancy and job seeker data. These data are often one of the most readily available sources of LMI in middle-income countries and are often used as an indicator of labor market demand and supply. However, there are several concerns about validity, even when job vacancies registered at the employment services are supplemented by special job development efforts (such as adding information from job advertisements placed in public media by employers):

- In countries where there is a large informal economy, the job vacancy information at the job bank may represent only a very small portion of actual demand.
- Formal sector registration of job seekers and job vacancies is normally voluntary, and as such there may be a large undercount of demand and supply, even if there is an unemployment benefit system operating (which is often not the case in developing countries).
- Even in highly developed countries, only about 25% of job vacancies normally get listed, and these are often in low-skilled and semiskilled occupations.
- Job vacancies may not really be new openings as such. They may just represent continuing and rapid turnover in unattractive occupations (i.e., occupations with low wages and difficult working conditions), and thus do not reflect hard-to-fill jobs or high-demand jobs.

In summary, job bank data need to be used with caution and in combination with other LMI in setting priorities.

Employer Advisory Committees

Employer advisory groups, sometimes referred to as focus groups, are often used to obtain LMI and are one of the qualitative methods of obtaining information on employment and economic trends. Three levels of committees are used: national multisector tripartite committees to give general trends, sector-specific committees to give more focused input, and occupation-specific committees to give very direct input on a group of similar occupations to assist in development of a particular occupational standard. These committees can provide useful information and can help interpret information from other sources. However, the data are anecdotal, may be subject to bias from individual committee members, and need to be integrated carefully into the overall analysis.

Occupational Employment Surveys and Long-Term Forecasting

Some methods of forecasting long-term demand (i.e., 5-10 years) for occupations have proven fairly reliable, can quickly respond to major shifts in the economy, and overcome the problem of inaccurate employer forecasts. Few developing countries have the necessary data systems, but it is useful to mention a technique that is used in several developed countries—the U.S. Occupational Employment Statistics program (OES). This technique includes sample surveys of employment in enterprises, by sector, on a rotating basis about every 3 years. This produces a profile of employment by occupation and by sector (see figure 2). Employment by occupation in the total sector can be extrapolated by using employment data generated from national employment files. Growth or decline in overall employment in the sector is then forecasted by a multiple linear regression technique using variables that have proven to have a significant effect on employment in the sector (e.g., financial interest rates affecting construction). If the overall employment in the sector increases, employment in each occupation in the sector will increase proportionately. Information on withdrawals of labor from the sector due to death and retirement are developed from life insurance actuarial tables, which provide quite accurate data by occupation. These data are combined with the overall growth or decline figures to give a net result by sector and occupation. These techniques can rapidly respond to changing economic conditions as the sector data can be quickly recalculated. Once the data have been calculated for each sector, they can be combined to provide an overall view of occupational growth or decline for an occupation across all sectors (see figure 1).

Developing Occupational Standards

There are several major methodologies for developing occupational standards, all of which start with analyzing what people in a certain occupation are doing. In spite of this common basis, methods differ considerably and so do the occupational standards that are the result of the analysis. Occupational standards are much less standardized than the term "standards" suggests. Many but not all developed countries have occupational standards, and middle-income countries are increasingly developing standards (see Appendix 4 for examples from selected countries). In some cases, countries have standards that go beyond the concept of occupational standards; they mix and try to define the outcomes of both employment and education. This has advantages and disadvantages, because employment and education may have interests that are in conflict (see chapter eight). The more complex approach has a strong appeal in middle-income countries such as in Central and Eastern Europe and the Eurasian subcontinent. Many of these countries are in the process of developing standards en masse after they have clustered very job-specific training programs into wider occupational profiles with common tasks.

Factors Affecting Evolution of Methodologies

In the past 20 years, economies and the organization of work have fundamentally changed. Occupations have become more complex. Employees have more responsibilities linked with more competencies and less routine. This concept supports flexibility in labor mobility and production and can enhance the innovative capacity of companies by enabling enterprises to assimilate new production technologies rapidly and adapt themselves quickly to new demands of the market (Farla 2000). The growth of SMEs, the knowledge economy, and in particular the services sector worldwide has also raised demand for a more flexible work force. These changes have caused an *evolution* from initial task-based to a broader competence-based approach to occupational analysis and standards during the past 10-15 years.

Trends in Methodologies

In response to those changes, new methods for occupational analysis are being developed and attention has shifted from analyzing discrete job tasks to analysis of broader occupational competencies. Definitions of competencies vary and reflect the differences in the approach taken by different countries to the development of occupational and training standards. For the purposes of this paper, occupational competency is defined as *the ability to perform activities common to an occupation, within an acceptable range.* As job analysts examined the different tasks that constitute a job, they noticed that a number of the tasks for different parts of the work process require similar, if not identical, abilities. By grouping the tasks, they noticed that only some of the tasks required specialized technical knowledge and skills, whereas others were more generic. Examples of the latter were

problem solving, communications skills, the ability to take initiative, and some technical skills (i.e., safety and environmental). These generic functions are called core or key skills to distinguish them from technical skills and basic skills (numeracy and literacy).

Methodologies for Development of Occupational Standards

Three methodologies for defining occupational standards reflect this *evolution* from initial task-based to competence-based occupational analysis and standards. The methods include job/task analysis, DACUM, and Functional Analysis. Additional detail on the history, application, and current use of each method is contained in Appendix 1.

Job/Task Analysis

The establishment of occupational skill standards started with job analysis. Frederick Taylor (1911), the originator of "scientific management," is usually credited with conducting the first formal job analyses. This approach has been predominant for a long time in many industrialized countries, since it is especially suited to analyze tasks in a mass production process and in situations where there is little flexibility in the organization of production processes. The aim of the analysis is to divide and subdivide jobs and tasks into their constituent parts, in order to provide information for training and to develop benchmarks for piece rate wages. In spite of fundamental changes in job and task analysis, the approach is still used for specific purposes and in certain sectors, including some service and administrative occupations.

DACUM

The DACUM approach to occupational analysis is quite different from job analysis (Norton 1997). DACUM is an acronym for Developing A CurriculUM, but it actually involves only the first step in a full vocational curriculum development process. Instead of job observation, DACUM uses guided group discussion with expert workers. The DACUM process includes, in addition to occupational specific tasks, the separate identification of work enablers: general knowledge and skills, worker behaviors (personal traits and interpersonal skills), and tools and equipment used. These tasks become the focus of curriculum development. DACUM is used in many developed and developing countries.

Functional Analysis

Functional Analysis (FA) is not a method for occupational analysis in a strict sense. Rather, the idea is to start with the identification of the key purpose of an occupation in the major sectors where it is found, identifying the main functions, breaking these in turn down to subfunctions until outcomes for each function are identified following a strictly logical sequence. Functional Analysis, as practiced in the United Kingdom, uses a consultative process that involves practitioners, managers, and, in some cases, the users or "consumers" of standards. The modules are analyzed one by one to identify the perfor-

mance requirements. The FA method has been used in several countries in Europe and the Middle East and is being experimented with in South America.

Pros/Cons and Comparisons of Different Approaches

All methods have their merits; therefore, one should not disqualify an approach before evaluating it against the desired outcome, resource constraints, and the setting in which the analysis will take place. None of the methods will produce totally reliable (consistent) results, as the processes remain somewhat subjective.

Comparisons of All Three Methodologies. Comparisons show distinct differences. First, using job analysis, repeated onsite observations are required to identify tasks, which can then be generalized to the occupation. This has resource implications and thus job analysis may cost more than DACUM and FA. Second, job/task analysis may be appropriate if the occupation involved is rather unique. For example, the occupation may be in a specific setting in the public or private sector, where failure to perform the task or job exactly as required carries a potential for considerable liability. Such occupations include public emergency services, health technicians, and nuclear power plant operators where there may be a strong rationale for job analysis rather than other approaches, which may produce more generalized standards. And, as noted previously, there are methods for identifying core skills and common occupational competencies between occupations from individual job analysis.

Comparisons between DACUM and FA. Comparisons show a degree of similarity in approach and resource requirements. First, the amount of resources committed to replicate the process is possibly less than with job analysis. Second, both DACUM and FA focus on work processes (either from the perspective of how occupations are performed or how they should logically be performed). Although both methods have solutions/mechanisms for linking the results of the analysis with training, the link in both cases may not be fully satisfactory for the design of training standards (see chapter eight). The DACUM map provides duties and tasks (competencies) performed in connection with each duty, whereas FA specifies key functions and individual functions that support them; both methods do the mapping to define performance requirements. The list of tools, equipment, materials, and supplies pertinent to the occupation identified during a DACUM workshop would be included in the range section of the Functional Map in FA. DACUM traits and attitudes are similar to overarching requirements in FA.

A considerable difference can exist between the concept of competence undertaken by FA and that used by DACUM. For the latter, a competency is the description of important tasks; at the same time, it is the sum of small tasks called subcompetencies. The totality of competencies makes up an occupation. However, FA does not describe the tasks; rather it identifies the results that are necessary to achieve the key purpose.

DACUM is perhaps a more straightforward bottom-up approach; it is more descriptive and therefore closer to traditional job/task analysis. Functional Analysis is more top-

down, structured, technical, and perhaps more objective. The results from FA may be more reliable than DACUM, but it remains a subjective method.

The deduction method that has to be followed for FA is more complex than the DACUM method. However, pilot experiences indicate that the FA methodology can be learned in a few days, even in a very different cultural context.

Levels of Skill in Occupations

Some occupational analysis systems, such as in the United Kingdom, New Zealand, and Australia, define levels of skills within occupations (i.e., entry level, midlevel, fully qualified). Others, such as the Vocational Technical Education Consortium of States (VTECS) in the United States, do not. The major reason for defining different levels is that it allows training institutions to target training at different levels (i.e., secondary training programs may target entry-level skills in a family of related occupations). This approach has a number of disadvantages: it may perpetuate classical boundaries between different educational institutions, build additional artificial boundaries within occupations and between training institutions, create linkages with wage and hiring requirements that may work at cross purposes with standards development and the concepts of modular training and lifelong learning, and complicate the occupational analysis. For this reason, some standards organizations deliberately do not define levels within occupations, but rather describe the full range of skills/tasks in occupations, often including information about the frequency, difficulty, and importance of individual tasks in the occupation. Institutions are free to develop and deliver the training they wish from the overall occupational analysis and then provide trainees with an assessment of the skills they have achieved (e.g., a skills "passport"). Trainees can then present this record to employers for the final hiring and job placement decisions.

Assessing Occupational Standards

Assessment is a critical link in the ongoing cycle of human capital development, whether it takes place in an institutional training program, outside of formal training programs, or on the job or is used to evaluate life experience. Assessment is also one of the crucial elements of lifelong learning both for individuals, who need a method of assessing and certifying qualifications developed during different life stages, and for training institutions that need to improve assessment and articulation programs as they strive to implement lifelong learning policy (OECD 2000). Assessment must be directly linked to and developed from occupational standards (as opposed to being derived from training standards), if it is to reflect and assess what a person is qualified to do in an occupation. Assessment programs have multiple objectives:

- For **individuals**, assessments can lead to certification, assist in initial job entry and upward and horizontal career mobility, and, in the context of lifelong learning, provide a method of documenting competencies learned at different times and through different avenues.

- For **employers**, assessment assists in hiring, promotion, and planning of internal training.

- For **training institutions**, assessments provide a method of benchmarking the quality of skills and knowledge provided against the occupational competencies actually required in an occupation. Through related accreditation and certification procedures, assessments also provide training institutions a method of marketing their training programs to individuals and employers.

Training institutions and staff may resist developing and using assessment instruments based on occupational standards. They may feel this challenges their traditional authority and limits their flexibility in assessing what they feel are critical elements of performance in an occupation. This issue is central to the reason for developing occupational standards in the first place, as opposed to just having trainers write curricula. The degree to which trainers accept and use assessment instruments based on occupational standards will be influenced by the degree to which they were involved in developing the initial standards. The use trainers make of standards will also be affected by the degree to which they feel free to assess additional items beyond the standards (which should not be an obstacle to development of core assessment programs).

Guiding Principles for Assessment

Assessment must meet minimum validity requirements (i.e., the assessment test really evaluates the occupational standard selected) and reliability requirements (i.e., the assessment evaluates the standard in a consistent way). If assessment instruments are created at the local level—from local or national standards and/or test item data banks—

and the results are to have broad recognition, it is important that local staff is adequately trained in assessment design and administration. If centralized standardized assessment instruments are developed, it is critical that this be done by trained assessment professionals in cooperation with the stakeholders who created the initial occupational standards. Errors in validity and reliability on nationally developed and administered assessment instruments will have a negative impact.

Content to Be Assessed

Assessment of occupational standards must include both knowledge and performance assessment. The competencies assessed will vary, depending on the nature of the occupational standard and the setting in which training has been delivered. For example: Are all skills being delivered by the training provider? Are some left for on-the-job training? and Is the training provider delivering only technical content? Assessment may, in addition to evaluating technical skills related directly to the occupation, assess other skills often referred to as core skills: basic skills, including literacy and numeracy; life skills, including social and citizenship skills; general employability skills such as communication and decision making; and depending on the occupation, possibly entrepreneurial and management skills.[1]

Administrative Approaches to Assessment

Broadly speaking there are two approaches: standardized tests and data banks.

Standardized Tests

This approach involves developing standardized performance and knowledge assessments and organizing testing at centralized locations either directly operated by or accredited by an institution like a standards organization. This continues to be a common approach in many developing countries that have worked with such organizations as the UK City and Guilds, which has assisted developing countries in adapting and administering testing programs based on original City and Guilds programs. More recently, IT companies like Microsoft and Cisco Systems have developed standardized assessments and related training programs that are used worldwide, and institutions are accredited to give certificates. This approach may ensure a standardized quality in assessment and provides for a comparison between the performance of clients from different institutions. However, the approach often requires establishment of a bureaucracy to develop and operate the assessment programs. This can stifle local initiative and slow adaptation to changing local occupational requirements. Such an approach also encounters significant assessment security challenges, particularly when applied in developing countries.

[1] The OECD, via the Project for International Student Assessment (PISA) and the International Adult Literacy Survey (IALS), is developing international comparisons and benchmarks for basic skills.

Data Banks

This approach involves developing data banks of performance and knowledge assessment items based on occupational standards and making them available to stakeholders (e.g., training institutions, employers) who then develop their own assessments based on the data bank. It requires a central staff at the standards organization who can train and certify staff in participating institutions to develop and administer their own assessments by randomly selecting items from the data bank. Creating this expertise at the local level in developing countries, to the extent that locally administered tests will be valid and reliable, may be a considerable challenge. This approach can reduce security concerns and staff requirements that are encountered with the standardized approach to assessment. Assessment items in the data bank can be directly linked to all activities in each occupation, and there is no central bureaucracy needed to develop and administer the assessments. Flexibility is also enhanced because, if there is modification in an occupational standard, a change can be made quickly in the related assessment data bank. If this approach is used, there is still a need for maintenance of a central registry of clients who have completed local competency assessment and certification in order to facilitate labor mobility and lifelong learning. (New Zealand and Korea have developed such registries.)

Types of Assessments

There are two basic approaches: criterion and norm referenced.

Criterion Referenced

In this approach an individual's performance is assessed against a defined standard and the results can be pass or fail (e.g., a machinist can or cannot perform a turning operation within an acceptable range of tolerance, or an aircraft pilot must execute a turn using instruments within specified altitude deviation). In some cases a percentage of questions are answered correctly (e.g., a machinist or pilot must answer at least 70% of the written questions on an assessment to get knowledge certification).

Norm Referenced

This approach assesses performance using standardized norm-referenced assessments whereby individuals are compared with others taking the same assessments. A norm can be established for pass/fail. This is useful for local, national, and international benchmarking. However, full application of this approach can raise questions regarding performance and safety in some occupations (such as in public transportation occupations), and standards may be below acceptable limits if all individuals score low during one period of assessment. However, this approach is used in some professions in some countries including those in the medical field (e.g., nurses), and minimums can be set for pass/fail.

The National Occupational Competency Testing Institute (NOCTI) in the United States provides norm-referenced services for over 170 occupational areas and standardized knowledge and performance assessment instruments that are used by employers, vocational-technical training institutions, and technical teacher training institutions. Institutions can set their own passing scores as well as compare their norms with other institutions for benchmarking (www.nocti.org). This approach was adapted for assessment of vocational teacher trainees in Saudi Arabia in the 1980s.

Linking Occupational Standards with Training Standards

Issues in Developing Linkages

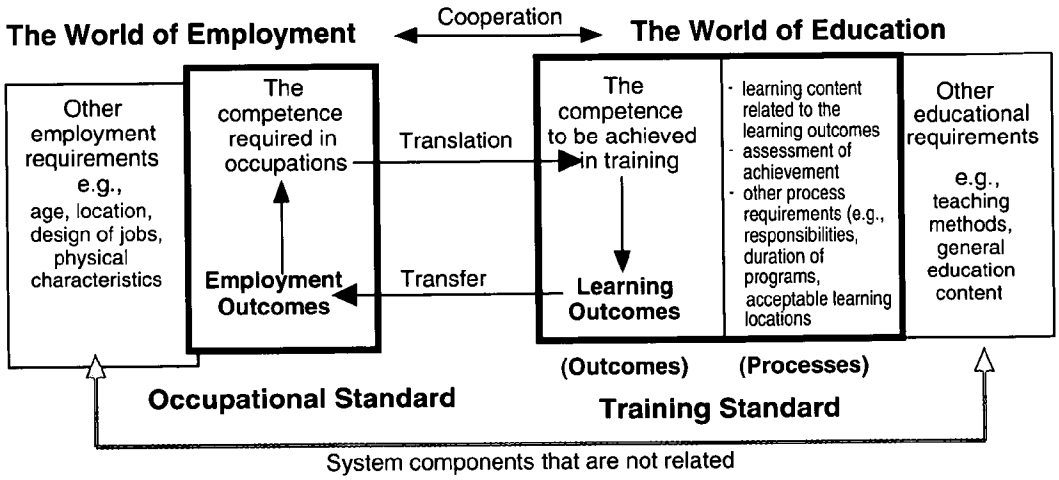
Training standards need to be linked to occupational standards if training is to be relevant to the real world of work. This linkage is sometimes absent, particularly in developing countries. The reason may be because occupational standards do not exist, or because training institutions do not use existing standards. There are a number of reasons why occupational standards may not be used by training institutions.

The answer may be that the worlds of employment and education are different. Each has a different set of priorities, motivations, and purposes. This could be referred to as "employment logic" and "educational logic." In the logic of *employment*, employers are interested in what people need to do, how they will do it, and how well they do it. They are interested in *outcomes*. In the logic of *education*, education professionals are interested in what people learn, how they will learn it, and how the quality and content of learning will be assessed. Education traditionally uses a language of input (syllabus, subject), process (teaching/learning methods), and assessment.

Training institutions, like employers, will guard their independence and their ability to design training programs as they see fit. They may regard the use of occupational standards defined by employers as narrow in scope and consider such standards as an invasion of their area of responsibility. A further complicating factor, in some countries, is that by law ministries of education have the sole right to grant and verify education/training assessment and certification.

Translating Occupational Standards into Training Standards

The needs of employment (occupational standards) must be translated into a language that can be understood in education and training. The goal is to translate the language of action and inputs in employment to the language of inputs in education, which enable education professionals to plan and deliver learning programs. One immediate step that can be taken is to develop learning standards and outcomes that describe what people will be able to do at the end of a learning program. Then learning outcomes can be linked to employment outcomes defined in occupational standards. Figure 5 represents the entire process.



Source: Adapted from an unpublished paper by Bob Mansfield and Hermann Schmidt, 1999

Figure 5. Translating occupational standards into training standards

In figure 5, the training standard has two components: outcomes and processes. The primary linkage is between the training standard outcome and the occupational standard employment outcome. If this direct linkage is made, employment requirements will directly determine the learning outcomes. Appendix 2 contains examples of how the linkage between occupational standards and training standards is made using occupational standards developed from the DACUM and Functional Analyses approaches. It should be noted, however, there may not be total comparability since some elements of occupational standards may not be included in training standards and vice versa. For example:

- *Employment* is primarily interested in the acceptable level of competence for a person to perform effectively in an occupation, which a person may achieve in education and which must be transferred into employment. But training standards may include other elements because of legislation, educational practice, and the educational infrastructure, which is not part of the occupational standard.

- *Education* may not be interested in some parts of occupational standards because education cannot influence them. For example, an employer may define jobs in a particular way that requires staff in a certain geographical location and with special physical characteristics; education can have no influence over these decisions.

Curriculum Development

Should standards organizations develop curriculum materials in addition to occupational and training standards and related assessment instruments? Some do, others do not. Curricula are a natural outgrowth of training standards that have been developed from occupational standards. There must be concrete linkages between these standards and

curricula, as well as assessment and certification, A standards organization will need to determine if they wish to undertake curriculum development work. On the negative side, curriculum development is on the "supply" side of the occupational training equation, and as such there may be a conflict of interest with the "demand" side, which includes developing occupational standards and assessments. Given this potential conflict and the large amounts of work that will need to be done in occupational standards development and assessment, curriculum development should perhaps be a second priority for a standards organization, at least at the outset. In addition, if the standards organization keeps out of the curriculum development business, the entire activity may seem less threatening to training agencies. Alternatively, a standards organization could have a separate department that does curriculum development.

Governance, Financing, and Administration

This chapter looks at some of the issues and choices that need to be made if a country decides it wishes to develop national standards and assessment systems. This scenario is different from focusing on a localized approach whereby local training institutions each work with local enterprises to develop local standards. The pros and cons of each approach are summarized in the introduction of this paper. It should be emphasized that the development of an understanding of the need for occupational and training standards at the local level is a prerequisite for successful operation of a national standards activity. An initial emphasis on local development does not preclude moving to a national approach at a later date. Appropriate administrative and financial mechanisms must be put in place if national standards are to be maintained and updated on a regular basis. And, if national assessment programs are going to be put in place, a repository where individual records of lifelong learning can be maintained should be established. Development of national standards does not require major investments in facilities and infrastructure. National standards organizations may be and usually are attached to existing institutions (i.e., chambers of commerce). However, unless such organizations are provided with minimal core staff and materials, over and above those already existing in the stakeholder organizations, development will flounder, standards will not be maintained, and the standards system will probably collapse. And, although each country wishes to have own standards in a broad range of occupations, developing countries need to prioritize development based on resource constraints and to ensure that standards are of high quality. In addition, developing countries may want to consider *adapting* some standards that already exist in developed countries, as opposed to developing all of their own standards.

Governance

The involvement of stakeholders in standards development needs to go beyond a simple advisory function, which may be acceptable at the local level, if standards are to survive and have credibility with stakeholders. There are several alternatives for establishing governance and administrative structures (e.g., protocols, laws and regulations, establishing foundations) and the option selected will vary by country (see Appendix 3 for an example of national legislation establishing a standards organization in Romania). If stakeholders are to have ownership of the products, it is essential that they have a formal role in the governance and policy establishment process.

Protocols

Protocol agreements between stakeholders may be appropriate at the outset to define governance structures and guide the process until better agreements and understandings are developed. If a protocol is used, however, the legal status and power of policy decisions made, which influence public policy, may be questioned.

Legislation

In most developed and developing countries, the legitimacy, governance, and financing are often embodied in legislation and regulation (see Appendix 3 for an example). In most cases this legislative support is embodied in related employment and training legislation (i.e., United States, United Kingdom) and in others it is in special legislation. However, establishing legislation at the outset of standards development may delay implementation for months or years, and passing legislation too early in the process may create misunderstandings that can be avoided by starting out with more informal stakeholder protocols. The danger of waiting to pass legislation, however, is that the conversion from informal to formal approaches may not occur and investments may be potentially wasted. This was the case in Turkey where multilateral project-financed development work was put on the shelf for some time because the stakeholders (including government) failed to get supporting legislation to Parliament in a timely manner before the development project was completed.

Foundations

Another option is to establishing a standards organization as a legal "foundation" or in an existing foundation that has a related function. This is possible in most countries and has been done in places like Romania, where the Council for Occupational Standards and Assessment (COSA) was located at the Chamber of Commerce as a base of operations; Turkey used an existing nongovernment training foundation as a base. An advantage of this approach is that it can keep standards development from being physically within and perhaps dominated by government supply-driven training institutions. But this approach may not work in some countries where foundations cannot receive government financing.

Existing Government Structures

An alternate approach, for start-up purposes, is to use a government stakeholder as an administrative agent for standards development. If government and/or bilateral/multilateral funding is being used to assist start-up, it may be necessary that all parties concerned agree that the government, which may be ultimately responsible for these funds, will be the administrative agent. This will ensure that use of funds is consistent with government laws/regulations and agreements with third parties. A disadvantage of this approach may be a "government takeover," which to an extent is what happened in the Philippines (see Appendix 4), and withdrawal of other stakeholders.

Financing Alternatives

There are different alternatives for financing development and maintenance of standards. Examples include allocation of government resources, use of funds raised by training levies on enterprises, international resources, grants and levies from stakeholders who are

members of a standards organization, sale of standards products and services, and collection of fees from clients such as individual citizens who are seeking assessment of skills. Most standards organizations use a combination of resources.

Development Costs

Experience in Turkey and Romania, both middle-income countries, indicates that the overall development process in such countries (defining and pilot testing procedures, developing about 250-300 standards and related assessments, developing related administrative infrastructure) will require about US $2 million over 3-5 years.[1] Such estimates of the cost of initial development are based on a blend of cash and in-kind support from stakeholders (particularly from employers that can provide expert workers to assist with defining standards), and they include limited external technical assistance, local staff and consultants, materials, office equipment, and supplies.

Recurrent Costs

Costs to sustain a national OS infrastructure include the payment of a core staff (i.e., 8-10), infrastructure, and direct costs (i.e., equipment, material, rent, utilities, local travel). Costs for development and maintenance of standards will vary by country. As products are developed, a standards organization can generate some revenue from the sale of test data banks, training of stakeholders to use standards and assessments, administration of certificate/testing programs for some stakeholders who may not want to do this themselves, and collection of nominal fees from individuals for assessments and record maintenance. The national standards authority in New Zealand (Standards New Zealand) does this, but this approach may not be appropriate in developing countries. However, in developing countries, it will be difficult for a standards organizations to be fully self-sustaining through the sale of products and services. A portion of recurrent costs should be underwritten by stakeholders, including government. Moving too fast to make a standards organization totally self-sufficient may well result in collapse of the system.

Sustainability

In developing countries, government financial resources are normally in short supply. In-kind resources including office space for staff, utilities, and support infrastructure may be available from stakeholders. If this approach is used, the resources need to be *reallocated* to standards activities, and existing stakeholder staff should not just be assigned standards responsibilities in addition to their ongoing work. If the government provides the core staff, this may have negative implications for hiring and salary levels. This approach may also complicate matters if other stakeholders view this as a "takeover," as occurred in the Philippines. The government may be able to use vocational training funds to support standards development. Cash resources from employers may be available by using training levy funds. As previously mentioned, strong consideration should be given to having employers provide in-kind, short-term staff resources to help write individual occupa-

[1] Estimates based on World Bank-financed occupational standards components in the Romania Education Reform Project and Turkey Employment and Training Project implemented between 1995-2000.

tional standards. Finally, external resources from bilateral and multilateral sources (either as grants or loans) can often be obtained to support development costs, but these funds are not normally available for recurrent costs.

Administrative Issues

Policy and Power Sharing

In operating a standards organization, it is critical that power be shared equally between what may be unequally matched partners, particularly at the outset; power sharing should be reflected in organizational structures. This means that equal proportions of the votes regarding policy issues should be allocated to different stakeholders (e.g., government, employer, and union/professional association representatives). This may be difficult with varying numbers of organizations involved. The legal status of a standards organization, which may wish to establish policy for the use of government and/or bilateral and multilateral funds for which the government is ultimately responsible, may raise issues.

Staffing a Standards Organization

Core staff will be needed to supervise development of standards. Decisions need to be made regarding how staff get paid, whether they will be civil servants and bound by civil service hiring regulations, and where they will be housed (e.g., at a foundation, a government institution, or at an employer or labor organization). Decisions also need to be made regarding the functions and number of staff. Functions may include (1) acting as the secretariat for the standards governing board; (2) providing overall administrative support; (3) performing quality control and recordkeeping for development of occupational standards, assessments, and certifications; (4) developing standards, assessment, and certification programs; and (5) undertaking public relations, marketing, and training of stakeholders in the use of standards and assessments.

In many developing countries, the professional skills needed to develop policies and procedures for standards development and assessment may not be available. Related external technical assistance and training may be needed. The selection of standards staff can become politicized (e.g., different stakeholders may each want their candidates, regardless of professional qualifications). The housing of the staff can also be a political issue (e.g., should offices be provided by one stakeholder, or should staff be housed in a neutral location?). The status of staff (civil servants, foundation staff, contract staff, private sector staff) will affect the quality of the personnel recruited. Finally, the decision regarding the director of the standards organization (e.g., the chairman of the governing board) is important. In order to ensure that well-qualified individuals will apply, salaries will be appropriate, and the needs of employers will be served, the positions should generally not be within the civil service. This has direct ramifications for the selection of the host agency for the standards organization and staff.

Finally, a large number of short-term local consultants will be needed to develop standards and write related performance/knowledge assessments. Full-time staff can train and monitor these short-term consultants, but they cannot and should not attempt to write individual standards because the job is too large and they do not have the necessary range of occupational expertise. One approach is to ask key stakeholders, in particular employers, to donate the services of short-term specialists for occupational standards writing teams. This is essential to build ownership of the products. When this approach is used, resources from the standards organization are normally made available to pay the direct costs of the donated staff (e.g., travel and per diem, materials and supplies required by the writing teams). This activity is potentially a very expensive exercise, and every effort should be made to have employers and other stakeholders contribute personnel resources to offset costs and build ownership.

National Dissemination and Public Information

It is critical that standards be continually updated and disseminated throughout the country to key stakeholders. This issue needs to be addressed at the outset. If the key stakeholders are fully involved in development, dissemination will be greatly enhanced, but it will need to be augmented by specially developed orientation, marketing, and training programs. These programs should be run by standards staff to ensure that each stakeholder and potential user of standards products and services knows what products are becoming available and how they can use them to improve the efficiency and effectiveness of their organization. Finally, a schedule and priorities for reviewing and updating of standards should be planned and implemented in parallel with the initial development program.

To support dissemination activities, the core staff will need to maintain (1) a paper copy of an automated repository of international and locally produced standards and certification programs; (2) general publicity programs, including an initial awareness campaign for stakeholders and more specific publicity programs to use initial standards as they become available; (3) onsite training programs developed for stakeholders; and (4) a central registry for institutional and worker certification. These activities will require the allocation of several full-time core staff, plus support hardware and infrastructure.

International Linkages

How will the standards organization ensure that they have access to standards from other countries? Many countries and enterprises have already invested a great deal of time and money in developing standards. Although each country is unique, care needs to be taken that work is not unnecessarily duplicated. As noted at the outset of this paper, trends in international trade and the need to improve efficiency and productivity support the importance of developing common skill standards between countries. It is imperative that a new standards organization have resources to visit other standards organizations, review procedures, and obtain existing standards, with the objective of benchmarking and at times even adapting them for local use. Professional associations can facilitate such linkages.

Summary and Key Recommendations

Development of occupational and training standards produces economic and social benefits. Countries are faced with multiple alternatives when developing standards. The experience of OECD countries is useful, but developing countries need to select alternatives that are appropriate for local conditions and that reflect the availability of resources to sustain development.

Local or National Standards

Developing countries may start with pilot activities at the local level, then move to a national approach. However, continued local development will lead to fragmentation and duplication and will not promote internal and external labor mobility. Some national leadership is needed once pilots have been completed, as resources are available.

Stakeholder Involvement

Employers, professional associations, and labor representatives need to be involved formally from the beginning to ensure that the process is demand and output driven. Employer involvement is crucial for drafting of occupational standards, but less so for design of assessments and training standards. Employer participation will be difficult to maintain, particularly in the informal/small business sector, unless they see the benefits.

Labor Market Information (LMI)

Multiple sources of LMI should be used. Overreliance on short-term "job bank"-type information should be discouraged. Medium-term employer surveys can provide qualitative economic and employment information, with low investments, in developing countries where other sources of information are not available.

Developing Occupational Standards

Several major approaches are available. In selecting an approach, the costs of staff training and replication should be estimated prior to making a final commitment. Developing countries should obtain standards from other developed and developing countries for benchmarking purposes and with a view toward adapting selected standards, particularly those that are international in scope. This will save resources, speed development, help ensure the quality of standards, and facilitate labor mobility.

Summary

Assessing Occupational Standards

Key choices need to be made with regard to approach and types of assessments. Whatever the approach taken, performance and knowledge assessment should be directly linked to occupational, as opposed to training, standards. Assessments must be both valid and reliable if they are to be credible to stakeholders (i.e., employers, labor, training institutions). Development of assessments requires highly trained personnel and some countries may need initial external assistance to accomplish this task.

Linking Occupational and Training Standards

The leadership for this activity can reside with training institutions. It is critical that there be a direct link between the occupational employment outputs and the educational inputs. This linkage is sometimes not clear in developing countries and the skills of trainees are not respected in the marketplace.

Governance, Financing, and Administration

Stakeholder involvement must be formalized as a country moves toward development of national standards. Funds must be set aside for development and recurrent expenses to ensure sustainability. Careful consideration must be given to which institution will host the national system and how core staff will be selected to ensure credibility of the products. Dissemination and public information is needed to get products understood and used by stakeholders. Countries that embark on national standards development need a long-term view. Stakeholders must provide minimal ongoing support to expand and update standards and assessments or the system will fail.

Appendix 1
Defining Occupational Standards

Job Analysis

Historical Background

Taylor's approach involves actual observation of workers performing their jobs. Equipped with a clipboard and stopwatch, a job analyst observes, times, and records each action of the worker. Frank and Lillian Gilbreth began the practice of filming workers and describing each action in terms of its basic *therbligs* (search, find, grasp, etc.). The term is their name spelled backward except for the *th* (Gilbreth and Gilbreth 1917). The work of these pioneers laid the foundation for improved methods of production, as well as creating the stereotype of the *efficiency expert* who is responsible for the design of ways workers can do their jobs better and usually quicker. Additional methods to gather information were added over time to refine the process, including analyzing documents on the work process in plants; interviewing experts, workers, and managers; and analyzing scientific work in relevant fields. The analysis process that started with Taylor and the Gilbreths has survived to this day and is also known as task analysis. The aim of the analysis is to divide and subdivide jobs and tasks in their constituent parts, in order to provide information for training and to develop benchmarks for piece rate wages.

Application

Job analysis is suitable to analyze and define jobs and tasks for organizations that are based on a Tayloristic concept of labor. This implies a maximum division of work of standardized tasks. It was particularly popular in the United States, based on the presumption that all the wisdom and insight and entrepreneurial daring were concentrated in a very few professionals and managers at the top. The vast number of people at the bottom of the pyramid were valued for their muscles, not for their mind (Tucker and Ruzzi 2000). However, analysis through actual observation is time consuming and usually limited to a small number of workers. Often, it is not in the personal interest of workers to demonstrate for an analyst the most efficient ways to perform specific tasks. The speed with which the observed tasks are performed typically becomes the baseline for setting the number of operations to be completed or production quotas that must be met within specified time limits.

Current Use

In spite of fundamental changes, job and task analysis is still used for specific purposes and in specific sectors. It is used in ergonomics to identify how to improve working conditions. It is used in some human resource management work in the United States to bring job descriptions in line with more classical American leadership principles. In Europe, where the emphasis has been on broad human resource development, it is not widely used in industry, although there are recent trends suggesting that this approach is increasingly being adopted to define jobs in new administrative occupations in some

subsectors (e.g., telephone call centers). The armed forces are a sector that does most of its occupational analysis on the basis of job and task analysis. For example, the U.S. Navy uses a task analysis-based program called NOTAP (Navy Occupational Task Analysis Program) for the definition of occupational standards. The U.S. Air Force has also applied the techniques, including development of automated methods of clustering and identification of core tasks within career ladders and between related occupations. Job analysis was used widely in command economies for analyzing and defining tasks and jobs. In the Soviet Union, as in many centrally planned economies, most people worked in large collective industrial and agricultural complexes. The collective production process implied a division of work into small dependent components. The definition of standards was highly centralized in the Soviet Union. An All-Union Institute of Labor in Moscow dealt with job and task analysis for most occupations. The method is still strongly rooted in the successor states of the Soviet Union, often in an adapted scientific format such as is currently the case in Poland (Sepowski and Kwiatkowski 2000).

DACUM

Background and Methodology

DACUM uses guided group discussion. A trained facilitator leads a small group of expert workers in a discussion of what they do on a day-to-day basis. Groups vary in size but a range of not less than 5 or more than 12 is recommended. A typical analysis takes 2 days. The workers are guided to describe their activities in terms of tasks expressed as behavioral competencies that involve a verb, an object, and usually a modifier (Mansfield and Schmidt 2001). For example, one task on a DACUM chart for Computer Support Specialist is "monitor hardware status, install peripheral devices, and configure network equipment." Each member of the group is encouraged to describe all of the activities in which they engage. This whole-group brainstorming provides the basis for identifying the major duties of a job. The tasks that make up the duties are then specified. As each work activity is proposed, the group discusses it and comes to consensus on how it should be stated as a task. As more and more tasks are listed, the facilitator asks the group to sort them into the workflow sequences in which they are usually performed. The results are then checked with other workers outside the discussion group.

Application and Current Use

The DACUM process also includes the separate identification of work enablers including general knowledge and skills, worker behaviors (personal traits and interpersonal skills), and tools and equipment used. The experts are also asked to identify future trends and concerns that may affect what they do and how they do it. The group discussion serves as an ongoing verification of each task, but the DACUM process is not complete when the group has finished its work. It is recommended that the duties and tasks identified by the original group be verified by surveying 50 or more similar workers and/or supervisors of such workers. Those surveyed are asked to rate the importance of each task and how difficult it is to learn to perform it. These ratings are essential information for identifying

tasks that are both important and difficult to learn. These tasks become the focus of curriculum development. DACUM is used in many developed countries (United States, Canada, Australia), as well as some developing countries that are establishing national occupational standards (Malaysia, Turkey, Hungary, Mexico, Nicaragua, Sri Lanka, Venezuela).

Functional Analysis

Basic Approach

Functional analysis starts with the identification of the key purpose of an occupation in the major sectors where it is found and identification of the main functions, breaking down these in turn into subfunctions until outcomes for each function are identified following a strictly logical sequence. The technique can be applied to multiple sectors, to a single sector, or at an individual enterprise level (where it would produce a job, as opposed to an occupational, analysis). By concentrating on the functions or results/outcomes instead of the activities, the descriptions produced are independent of the technology or methods used to achieve the function. In other words, instead of describing what people are doing, FA describes what people have to achieve. The logic behind FA is that functions are not independent, but are in strict relation to the working environment.

Methodology

The consultative process with stakeholders is used twice—first to develop the standards and second to confirm their accuracy. The methodology starts with functional mapping, which is an analysis of the sector starting with the key purpose statement and subsequently analyzing down to individual functions. For example, "making bread products that meet clients' needs" could be the key purpose for a functional analysis of the occupation of baker. The major functions might be "preparing the work space," "checking the quality of raw materials," "calculating material requirements and mixing the dough," etc. Each of these functions can be analyzed again to form functions that represent the responsibilities and duties of people in employment. The final level of analysis, in the original methodology, is referred to as a "Unit of Competence." In the version developed within the ETF, the final level of analysis is called a "Module."

The modules are analyzed one by one to identify the performance requirements. The performance requirements do not identify the technology and methods used, which makes the approach more flexible and applicable to the occupation in varying circumstances. The methods and technology used are described separately, in what is called the "range." Outcomes that apply to the key purpose or main function as a whole are described separately (e.g., organizational, interactive, and environmental [including safety] functions). In FA these are called "overarching requirements" and are described in separate modules.

Current Use

The FA method has been used in several countries (United Kingdom, Egypt, and Mexico).[1] The ILO is piloting its application in South America. The EU has piloted applications to develop occupational standards at the local level in selected countries in the Newly Independent States and Mongolia (Mansfield and Schmidt 2001).

[1] In the UK, 95% of OS are defined using FA. Note also that within the UK there are separate qualification systems in Scotland and in the rest of the UK, both using FA.

Appendix 2
Linking Occupational and Training Standards

DACUM

Example of a Learning (Performance) Objective Developed for a Task from a Specific Occupation

The following is an example of how curriculum developers, working in cooperation with subject-matter experts, translated a task from a DACUM analysis into a learning, or performance, objective. The occupation analyzed was *Fleet Maintenance Technician* for a major electrical power company. This analysis was conducted with eight master technicians who had been selected by the power company to participate. They identified 25 duties (groups of related tasks), one of which was *maintain steering system*. One of the tasks in this duty was *perform wheel alignment*.

A performance (learning) objective has three parts:

Performance (task or competency) that the learner should be able to do
Conditions under which the performance is expected to occur
Criteria of successful performance (through reference to an appropriate measure)

This statement is accompanied by enabling objectives, which lead to (enable) the achievement of the performance objective and prerequisites that specify the background knowledge the learner must have to acquire the competency. Here is how these three components were written for the task *perform wheel alignment*:

Performance Objective for the *Perform Wheel Alignment Task* for a *Fleet Maintenance Technician*

Given the need to maintain the proper operation of the steering system (*condition*), perform wheel alignment procedures (*performance*); performance must meet the manufacturer's and Fleet Management's criteria for wheel alignment procedures as noted on the Performance Exam (*criteria*).

Enabling Objectives

Gain knowledge of wheel alignment principles.
Practice recognizing proper and improper wheel alignment.
Practice performing wheel alignment.

Prerequisites

Knowledge of steering system

Curriculum Development and Assessment

As part of the DACUM process, learning activities, practice exercises, and self-assessment materials are developed for each enabling objective.

A final performance examination is also developed for use by the learning facilitator. This typically consists of a checklist of the criteria that the learner must meet to be judged capable of performing the task. These criteria usually refer to process (sequence), product, safety, worker behaviors, and time measures.

Functional Analysis

Example of an Employment and Learning Specification of a Task from a Specific Occupation

Functional analysis provides three related specifications :

The employment specification indicating what the person must be able to do in employment
The learning specification—what a trainee needs to learn to be effective in employment
The assessment specification—how to document what the trainee has learned, compared to the employment specification

Functional Map. The following is a sample of a functional map of an occupation in a restaurant:

Key Purpose: Prepare the restaurant, serve food and drinks, and process accounts	Prepare a restaurant for food service and special events	Prepare a restaurant for food service Plan and prepare for special events
	Prepare and serve food and drinks to customers	**Serve food and drinks to customers** Prepare, cook, and serve food at the table Mix and serve drinks and manage the bar service
	Take payment for services and accounts	Take payment for food and drinks Reconcile and process amounts
		Contribute to the organization of work, effective relationships, and social environmental requirements

Employment and Learning Specifications. The following is a sample of the employment and learning specification for one task—*serve food and drinks to customers*:

Employment Specification		Learning Specification	
Performance Requirement	The Range	The Skills Required	The Knowledge
(a) Welcome customers politely, take and store coats and other personal items	Customers: individuals, groups, special needs (e.g., disabilities)	Recognizing and responding to customers' special needs Effective communication with customers	The characteristics and needs of different customers The principles of effective communication Storage of customer property and legal responsibilities
(b) Check reservations, offer options where tables are not available, and show customers to a table	Options: waiting for a table to clear, making later reservations, suggesting an alternative restaurant	Effective communication with customers Interpreting reservation books	The principles of effective communication Reservation systems

Appendix 3
Sample Occupational Legislation

Romanian Government Decision Regarding the approval of the establishment of the Council for Occupational Standards and Certification (Assessment)[1]

In accordance with art.107 (1) of the Romanian Constitution and Appendix no. 2 part A (5) of the Governmental Ordinance no. 24/1994 regarding the endorsement of the Loan between Romania and BIRD for pre-university education reform, signed at Washington at 23rd May 1994, approved by the law 126/1994. Romanian Government decides (Bucharest, 23 September 1999):

Art. 1. It is approved the establishment of the Council for Occupational Standards and Certification—COSA, as a tripartite body—Government, employers confederation and trade unions, autonomous, standing, nongovernmental, nonprofit, national public interest with juridical personality, entitled to develop a new system of assessment and certification of vocational competencies based on occupational standards.
Art. 2. Venue of COSA is in Bucharest, 26 Eremia Grigorescu St., sector 1, and building belonging to Ministry of National Education.
Art. 3. (1) COSA aim is to establish the institutional framework, which allows ensuring of a trained, assessed, and certified workforce based on occupational standards.
(2) For achieving its aim, COSA is entitled to assure the quality of the proposed system and to issue vocational competency certificates.
Art. 4. COSA is organized and works in accordance with this Governmental Decision and with its internal regulations which will be developed in accordance with the Loan between Romania and BIRD for pre-university education reform, signed at Washington at 23rd May 1994, approved by the law 126/1994.
Art. 5. COSA, as a tripartite body, within all the parties decide together about occupational standards and assessment and certification practices, has the following tasks:
(a) establish specific criteria and procedures regarding the development of occupational standards;
(b) endorse the new occupational standards, modifies and cancel the existing occupational standards;
(c) recognize, based on its own criteria, agencies as standards developers,
(d) develop of an unitary methodology of personnel assessment based on occupational standards;
(e) certifies the assessors of occupational standards based on vocational competencies ; it can select and train the assessors of vocational competencies;
(f) issue the COSA certificates to individuals recognized as meeting occupational standards;
(g) accredit using its own criteria organizations to conduct assessments against the endorsed occupational standards;
(h) develop databases for occupational standards, accredited assessment centers, recognized occupational standards developers, certified assessors and individuals receiving COSA certificates;
(i) represent and sustain Romanian interests in the vocational competency certification at the international level;
(j) contribute at the preparing of the laws in order to put in accordance the Romanian legislation with European norms in vocational competency certification area;
(k) provide training, know-how transfer and technical assistance in its activity field;
(l) sell occupational standards, specific materials in accordance with Romanian and the international laws;
(m) Perform any other activities in accordance with the existing legislation in its activity field.
Art. 6.
(1) Organizational structure of COSA consists of
(a) General Assembly
(b) Administrative Council (9 members), which includes the president, two vice presidents elected by the General Assembly
(c) Specialized departments
(2) Tasks, duties and responsibilities of the organizational structure will be established by COSA internal regulation.
Art. 7. COSA patrimony consists in acquired goods in accordance with the Loan
Art. 8. The expenses regarding the COSA activities are assured from the Loan and also by own revenues for services and products, subscriptions, sponsors, and other funds in accordance with the law.
Art. 9. COSA internal regulation will be developed in a month after the publication of the present decision in the official newspaper and will be approved by COSA General Assembly.

[1] A private translation by Cristina Ionescu

Appendix 4
Summary of Selected Standards Systems

Canada

The Canadians have approved a limited number of industry groups to develop skill standards. The formal vehicle for such development is the Sectoral Partnership Initiative, which started in 1992 under the administration of the Partnerships Directorate of Human Resources Development Canada (website: www18.hrdc-drhc.gc.ca/programs/spi/desc.asp). Some of the sector partnerships were in existence prior to the federal initiative. In 2000, there were 30 active sector councils. The Alliance of Sector Councils provides a coordinating and communication forum for the activities of the separate sectors (www.councils.org).

The councils that guide the partnerships have broad representation including, in addition to employers and labor, other federal government departments, provincial governments, and educational bodies. These councils have considerable discretion in how they decide to organize and operate. Skill standard development is not required but is one of the primary methods that most partnerships have adopted to achieve their several objectives. Most of the partnerships that have developed standards also attempt to align curriculum for training programs, establish accreditation/certification procedures, and fund or leverage training for the competencies they have identified.

Since the inception of the partnerships, much of the responsibility for human resource development has devolved from the federal to provincial government and funding for the sector councils has declined. This appears to have slowed the development and implementation of skill standards. A recent evaluation, however, was generally positive and encouraged increased support from the federal level (Expert Panel on Skills 2000).

Chile

Chile has recently initiated a 3-year project to develop a Competency Certification and Training Quality System. This project will define and pilot a methodology for development of competencies (skill standards) and will create and install systems needed for a National Competency Certification System. The project staff will initially work in three important sectors of the Chilean economy: construction, mining, and tourism. The number of skill standards to be developed will vary depending on the human resource needs in the sector and the decisions of a group representing companies and workers in the sector. The focus will be on certifying competencies demonstrated in the workplace, rather than acquired knowledge. Competency will be demonstrated via a portfolio of evidence that will demonstrate in terms of actual results that the person has achieved a consistency in competently performing functions in real work situations. As with skill standards systems in many other countries, one goal is to separate demonstration of competency from training. Competency may be acquired through formal training or through experience. The goal is to create skill standards that help companies meet their

skill requirements while also helping workers to demonstrate their skills, obtain jobs, and stay employed. The project includes seven types of activities: institutional articulation, sectoral analysis, identification and validation of competencies, design of assessment and certification system, training quality assurance, competency piloting, and evaluation and marketing.

The Chilean government and the Inter-American Development Bank are the primary funders of the initial, 3-year skill standards project. The Canadian International Development Agency is providing additional support. Following this initial public investment, the government of Chile hopes to create a self-financing system. Government support will continue in the form of tax discounts equal to the value of company investments on training and certifying competence, up to a maximum of 1% of the company's wage bill. However, the majority of the funding will be raised through sales of products and services including certification, accreditation, quality control, and competency consulting.

Germany

The social partners—business associations and unions—work closely together to develop skill standards for apprenticeship training. The Federal Institute for Vocational Education (Bundesinstitut für Berufsbildung— BiBB) supports and coordinates their efforts. When apprenticeship standards are to be developed or updated for a certain occupation or industry sector, BiBB convenes two committees. One, representing employers and unions, focuses on the basic standards (skill standards) for the content of apprenticeship training on the job. The other committee, including employers, unions, and state vocational education institutions, develops basic standards for the school-based portion of apprenticeship training. The committees work until they achieve consensus, which ensures rapid implementation of the final skill standards.

BiBB promulgates national training ordinances that state what apprentices should know and be able to do to qualify as workers. These training ordinances, or skill standards, specify the recognized occupation, duration of training, knowledge and skills to be imparted, guidelines for the organization of training, and requirements for the final exam. In addition to apprenticeship, vocational skills may be certified at two higher levels. Experienced journey workers may take courses leading to certification. These certificates are used to qualify for supervisory positions or to set up one's own business. Advanced courses are available in many sectors of the economy, including manufacturing, skilled trades (e.g., auto mechanic, baker, electrician), and services (e.g., banking, retail trade, and insurance). Like apprenticeship, the courses end with a comprehensive qualifying exam.

At the beginning of 1998, the German government's annual budget for development of national apprenticeship standards through BiBB was $26 million. A full-time staff of 366 employees at BiBB works to continually develop and update standards and encourage apprenticeship training. The German government invests additional funds to encourage implementation of skill standards. Subsidies are available to help employers in the former

East Germany by offsetting some of the costs of apprenticeship training. Other subsidies encourage employers in both west and east to hire apprentices from disadvantaged groups, such as recent immigrants. In addition, government funds to local chambers of commerce and industry and chambers of handicrafts are used to establish and operate regional training centers.

Japan

In Japan, most vocational training is conducted in the workplace as part of Japan's commitment to lifetime employment (for at least some core workers in large firms). As a result, training is often focused on specific skills needed to perform a job rather than general occupational skills. However, skill standards and certification do play a role in Japanese training, and their significance may grow because the country's economic difficulties have increased worker mobility. The Vocational Training Law of 1958 inaugurated national vocational skills testing system for the specific purpose of increasing the social status of blue-collar workers. More recent legislation has emphasized the role of national skill standards and certification as a way of upgrading worker skills.

Under current legislation, the Japanese Ministry of Labor (MOL) encourages worker training and certification at three levels. The content of all three types of training is determined by training standards, which are somewhat analogous to skill standards. The MOL develops these national training standards in consultation with the tripartite Central Human Resource Development Council, which consists of employers, unions, and educators. This council establishes expert committees to develop training standards and assessments. Training standards specify admission requirements, duration of training, curriculum, instructor qualifications, and facilities and equipment needed. The MOL uses these standards to review public and private training courses, accrediting courses that meet the standards. Following completion of approved courses, a worker may take a national trade test for a specific skill area.

The government of Japan supports both the development and implementation of national training standards and assessments. The MOL's capacity-building program provides subsidies for company training, supports public vocational training centers, and subsidizes national trade tests. Small and medium-sized firms that follow government guidelines may qualify for capacity-building grants, which can be used to establish training, assessment, and certification systems. Although operated by the federal government, the capacity-building program is financed in part by employer contributions to the unemployment insurance system. These employer contributions are combined with general revenues from the national, state, and local governments.

Malaysia

Skill standards are a central element in the current strategy, which aims to make Malaysia an advanced industrial economy by the year 2020. The National Vocational Training Council (NVTC) established in 1989 is developing a system of national occupational skill

standards and certification. The NVTC works with skill advisory committees for each industry sector, made up of employers and expert workers. These committees first identify critical occupations for which skill standards are needed and then develop skill standards. The construction industry is represented by the public-private Construction Industry Development Board, which has established skill standards for many trades and offers certification to domestic and foreign workers. However, this is the only industry sector that has created an independent organization; other sectors work through the Skill Advisory Committees.

The government provides about $0.9 million annually for development of national OS and another $0.13 million for implementation of the skill certification system, for a total of about $1 million. Seven full-time government employees work with hundreds of expert workers to develop skill standards, using a DACUM approach. In addition, the certification division of NVTC employs 39 staff.

New Zealand

New Zealand appears to have the most articulated and comprehensive system of occupational skill standards in the Commonwealth and perhaps in the world. The core of its system is the National Qualifications Framework (NQF), which is developed and maintained by the New Zealand Qualifications Authority (NZQA) (website: www.nzqa.govt.nz). All qualifications currently recognized in the framework are composed of registered unit standards: statements that describe what a learner knows or can do. Standards specify learning outcomes. Because there are national definitions of unit standards, learners' achievements can be recognized in a number of contexts, transferred across training providers, and applied to related occupations. All unit standard credits, National Certificates, and National Diplomas achieved in a year are entered into individualized Records of Learning that are maintained by the NZQA.

The National Qualifications Framework is unique in that it allows for the formal recognition of the traditional knowledge of New Zealand's indigenous people, the Maori. The expert groups that set standards and take part in the accreditation of education and training providers are known as standards-setting bodies (SSBs) of which there are four types: National Standards Bodies (NSBs), Industry Training Organizations (ITOs), Standards Implementation Bodies (SIBs), and Whakaruruhau or advisory groups for the Maori. SIBs represent fields of learning, e.g., humanities, science, and business; ITOs represent industries, e.g., forestry, manufacturing, and tourism. A total of 178 SSBs are recognized by NZQA.

Philippines

A national system for establishing and certifying occupational skill standards has been in existence in the Republic of the Philippines since 1974. A needs assessment conducted in the summer of 1997 found that, although many workers were taking the certification tests (almost 100,000 in 1996), the standards are having relatively little impact on hiring decisions and training programs (Center on Education and Training for Employment

1997). The following summarizes the main finding of the 1997 needs assessment. The website of the agency responsible for skill standards, the Technical Education and Skill Development Authority (TESDA), is at www.pworld.net.ph/user/tesda/index.html, but the content at this site has not been updated since December 1997.

TESDA's overall strategy at the time of the needs assessment was to encourage employer involvement by providing extensive training in job analysis and test development. The goal was to build a cadre of trained workers in private companies who could assume primary responsibility for these functions. It appears to have been an unattainable goal. Few companies were willing to release their employees for the amount of training TESDA wanted to provide. Even obtaining workers for 1- or 2-day job analyses using the DACUM process was difficult. Lacking a high level of employer involvement, the TESDA skill standards are perceived by most potential users as a government function with limited utility for them. Interviews with employers that have been conducted for a needs assessment indicated that a TESDA skill certificate means relatively little in hiring decisions. A wider study of employer perceptions (Nathan 1997) found contradictory claims about skill certificates. Some respondents simply said the certificates were of little value in hiring decisions, and they relied on reports from other employers. Other respondents, however, said some employers discourage their employees from taking the qualification tests, because workers who obtain the certificates may leave for better jobs.

Romania

The Council of Occupational Standards and Assessment (COSA) was established in 1994 as a representative forum of employers, unions, and government by the signing of a Statement of Principles and on the basis of Law No. 126/1994 (see Appendix 3). With the Governmental Decision No. 779/ September 23, 1999, COSA is authorized to implement the new system of assessment and certification of vocational competencies. The Governmental Decision states that COSA is a tripartite, autonomous, standing, nongovernmental, nonprofit, public organization. Occupational standards endorsed by COSA will be the benchmarks of quality for both new workers entering the labor force for the first time and existing workers seeking retraining in new occupations. COSA will endorse occupational standards developed by professionals, thereby providing occupations with a relevant basis for education, training, and assessment.

COSA is not a regulatory authority and its endorsement of standards is not a prescription for any organization. COSA's methods are cooperative and advisory within the context of its policies. COSA establishes itself and its policies through working with occupational groups in the public and private sectors to produce material of quality and value to Romania. COSA's policy is to represent the interests of key employer, union, and government agencies in the introduction and implementation of an occupational standards-based system of assessment and certification.

COSA creates a relevant, transparent, and predictable policy framework by developing and monitoring policy relationships with governments and social partners, identifying and promoting best practice for its operations, and establishing a Working Party on Standards-

based Certification. Another goal of COSA's policy is to promote an understanding of and shared commitment to certification based on assessment against occupational standards among government, unions, employers, and the wider Romanian community. In this way, COSA establishes a reliable and accessible database documentation center and works to be recognized as the authoritative source of advice on standards-based certification in Romania.

In order to promote recognition of the Romanian Standards and Assessment Certification program, COSA maintains and develops productive international contacts and integrates Romanian standards-based certification practices with EU practices and approaches. Any legal person or entity can become a member of COSA. COSA aims to provide access to its work to any individual or group wishing to use or promote certification based on occupational standards. The new system of assessment and certification refers to a certificates of professional competence that must be a testimony that the person holding it has been assessed as capable of performing the competencies identified in the occupational standard. To implement the new assessment and certification system, COSA will set up and accredit assessment centers where any person, youth or adult, can be assessed against occupational standards in order to obtain a COSA certificate. A COSA certificate is the recognition of professional competence. Accreditation means that an assessment center has the knowledge and expertise to issue certificates of competence recognized by COSA for defined areas. Assessment centers will be agencies and organizations located throughout Romania that are experienced and qualified in the process of standards-based assessment. A condition for recognition or continuing recognition as an assessment center will be that the organization will allow COSA or its representatives to inspect its processes in order to maintain a high-quality system. COSA will work with other agencies involved with national reforms to ensure the recognition and understanding of its work as a significant component of the transition process.

COSA operates through its Research and Technical Services Unit (RTSU), for which staff with a diversity of backgrounds were recruited. The staff was trained to conduct the development of standards, train trainers, train assessors, and implement the system of assessment and certification based on occupational standards. RTSU works with a network of 25 local consultants trained for working as an extension of own staff. All assessors are trained and certified for specific competencies. Assessors will be certified and registered in COSA's database. The registration is necessary to ensure that the person has developed the skills required to conduct assessment.

United Kingdom and Scotland

The system in the United Kingdom has undergone periodic modification since 1986 when the National Council for Vocational Qualifications (NCVQ) was created. The council approved over 150 industry associations that developed 881 sets of National Vocational Qualifications (NVQs) that apply to about 90 percent of occupations and industries. In 1993, General National Vocational Qualifications (GNVQs) were introduced to combine the standards for specific occupations into broader clusters. The

GNVQs are designed to be integrated into the secondary education curriculum and to provide preparation for both employment and additional education.

In 1997, to further coordinate standards and curriculum, the NCVQ was combined with the School Curriculum and Assessment Authority to create the Qualifications and Curriculum Authority (QCA). Together with this merger, the number of industry associations that are approved to develop standards was reduced by more than half. The remaining associations, now called National Training Organizations, both develop standards and provide training. The number of NVQs awarded per year increased tenfold in the 1990s from 40,000+ to 400,000+. During the last half of the decade, the number has been fairly steady—around 450,000 (Department for Education and Employment 2000).

Additional information on QCA is available on its website, www.qca.org.uk. Information on educational implications of the qualifications system is available on the website of the Department for Education and Skills: www.dfes.gov.uk. The Scottish system is similar in many ways to that of England, Wales, and Northern Ireland, but responsibility for administration of all qualifications is centralized in the Scottish Qualifications Authority (SQA). As in the rest of the United Kingdom, two other agencies were merged to better align economic development with education and training through the creation of the SQA. The Scottish approach is built upon curriculum units that document attainment of specified competencies and are cumulative and transferable across training providers. The New Zealand system, discussed previously, drew heavily in its design upon the Scottish model.

United States

A national framework for occupational skill standards is evolving in the United States. Authorization of a formal federal role did not occur until 1994 when the National Skills Standards Act was passed as Title V of the Goals 2000: Educate America Act (EAA). There were, however, already a number of regional/national standards agencies operating in the United States for a number of years (e.g., Vocational Technical Education Consortium of States—VTECS) as well as several occupation- and sector-specific organizations (e.g., National Institute for Automotive Service Excellence). The purpose of Title V of EAA is "*to establish a National Skill Standards Board to serve as a catalyst in stimulating the development and adoption of a voluntary national system of skill standards and of assessment and certification of attainment of skill standards*" (P.L. 102-227, Sec. 502).

Two words are key in this statement, *catalyst* and *voluntary*. The intent is clear: the National Skill Standards Board (NSSB) is not to establish skill standards but to encourage and fund voluntary efforts to do so. The strategy that has been adopted is to require the main stakeholders in a defined industrial sector to come together and request that the NSSB recognize their partnership to develop standards for that sector. In the past 6 years, the NSSB has granted partnership status for four sectors: manufacturing, sales and service, education and training, and restaurants, hotels, and hospitality. The board has funded three other convening groups that may advance to partnership status if they meet established criteria. These groups are in the following sectors: communications, enter-

tainment, and information; finance and insurance; and utilities. These 7 sectors represent almost half of the total 15 sectors that the NSSB has identified as candidates for standards-developing bodies.

References

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Barr, Nicholas, ed. ***Labor Markets and Social Policy in Central and Eastern Europe, the Transition and Beyond.*** New York: Oxford University Press, 1994.

Biervliet, W., and Morfe, A. ***Strengthening Private Sector Participation in Philippines Technical and Vocational Education and Training. Specialist Report No. 2. The Emerging Training Market in the Philippines: The Technical and Vocational Education and Training Sector.*** University of Amsterdam Consortium, United Nations Industrial Development Organization, 1996.

Cavalli, Gudrun. ***Forecasts—A Method of Forecasting Developments in the Employment Sector.*** Stockholm, Sweden: Swedish National Labor Market Board, ISEKEN, April 2000.

Center on Education and Training for Employment. ***TESDA's Capability in the Development of Skill Standards, Curriculum, and Training Materials: A Needs Assessment and Recommendations for Training.*** Columbus: CETE, the Ohio State University, 1997.

Department for Education and Employment. ***Vocational Qualifications in the UK: 1998/99. Statistical Bulletin.*** London: DfEE, 2000. http://www.dfes.gov.uk/statistics/DB/SBU/b0169/index.html

Evaluation and Data Development. ***Final Evaluation Report on the Sectoral Partnership Initiative.*** Human Resource Development Canada, 1997. http://www11.hrdc-drhc.gc.ca/edd/SPI.shtml

Expert Panel on Skills. ***Stepping Up: Skills and Opportunities in the Knowledge Economy.*** Ottawa, Ontario: Advisory Council on Science and Technology, Industry Canada, 2000. http://acst-ccst.gc.ca/acst/skills/home_e.html

Farla, Ton. ***Transnational Analysis of Vocational Education and Training in the New Independent States and Mongolia.*** Turin, Italy: European Training Foundation, 2000.

Gilbreth, F. B., and Gilbreth, L. M. ***Applied Motion Study: A Collection of Papers on the Efficient Method to Industrial Preparedness.*** New York: Sturgis & Walton Company, 1917.

Lythe, David. ***Setting and Maintaining World Class Skill Standards.*** Wellington: New Zealand Qualifications Authority, National Skill Standards Board, June 1997. Excerpts at http://www.nssb.org/international.htm

References

Mansfield, Bob, and Schmidt, Hermann. ***Linking Vocational Education and Training Standards and Employment Requirements. An International Manual.*** Turin, Italy: European Training Foundation, February 2001.

Mason, W., and Richter, L. ***Reporting by Key Informants on Labor Markets.*** Geneva, Switzerland: International Labour Office, 1985.

Nathan, J. ***From Participant to Partner: The Role of Industry in the Development of TVET in the Philippines. Paper no. 6.*** Canberra, Australia: Department of Employment, Education, Training and Youth Affairs, and Philippines: MADECOR Career Systems, 1997.

Norton, Robert E. ***The DACUM Handbook. 2d ed.*** Columbus: Center on Education and Training for Employment, The Ohio State University, 1997. (ERIC Document Reproduction Service No. ED 401 483)

Oliveira, José, ed. ***Occupational Standards: International Perspectives.*** Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1995. (ERIC Document Reproduction Service No. ED 386 559)

Organization for Economic Cooperation and Development. ***The Role of National Qualification Systems in Promoting Lifelong Learning.*** Paris, France: Education Committee, Directorate for Education, Employment, Labour and Social Affairs, OECD, October 2000.

Sepowski, Z., and Kwiatkowski, S., eds. ***Developing Professional Qualification Standards in Poland.*** Warsaw, Poland: Institute of Educational Research, Institute for Terotechnology, 2000.

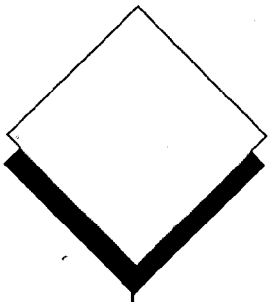
Szeleòu. Judith. ***Short-term Labor Market Projection for the Second Half of 1998.*** Budapest, Hungary: National Labor Center, 1998.

Tan, Hong. "Firm Level Efficiency in Developing Countries, The Determinants and Distribution by Firm Size." Paper presented at the Conference on Enterprise Training Strategies and Productivity, World Bank, Washington, DC, June 1995.

Taylor, F. W. ***The Principles of Scientific Management.*** New York: Harper & Brothers, 1911.

Tucker, Marc, and Ruzzi, Betsy. "A System of National Skill Standards and Certificates for the United States: Early Stages of Implementation." In ***In Search of World Class Standards in Vocational Education and Training***, edited by Ute Laur-Ernst and Jeffrey King, pp. 45-61. Bonn, Germany: Bundesinstitut für Berufsbildung, 2000.

Vikers, Margaret. ***Skill Standards and Skill Formation: Cross-National Perspectives on Alternative Training Strategies. Jobs for the Future.*** Washington, DC: German Marshall Fund of the United States, May 1994.



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