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Work Force Preparation for the  
New Economic Environment

by

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## WORK FORCE PREPARATION FOR THE NEW ECONOMIC ENVIRONMENT

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The impact of workplace modernization on the skill requirements of front-line workers calls for the development of new training systems in the United States. Recent changes in the modern workplace will force us to rethink how we finance and deliver virtually all of our work force preparation programs. The most promising new developments in public policy are federal and state efforts in worker retraining, new school-to-work transition programs including Tech Prep and youth apprenticeship, and new initiatives to establish a national-state system of occupational skill standards.

### Job Redesign and New Skill Requirements for Front-line Workers

Front-line workers generally refers to workers who are in jobs that currently require no college degree (about 70 percent). World-class manufacturing emphasizes decentralized flexibility by combining one or more of the following features.

First, world-class manufacturers are moving toward computer-integrated manufacturing which integrates production, computer, and telecommunications technology. This integration requires front-line workers to move from routine machine operation to production planning, monitoring, and continuous production adjustment.

Second, world-class manufacturers are moving away from the traditionally functional organization to one that is customer- or product-centered. Such a change will create stronger customer responsiveness and stronger employee involvement through continuous process improvement, total quality management (TQM) and quality-centered design, production, delivery, and service processes.

Third, world-class manufacturers are moving toward decentralized and integrated product and process development between management, engineering, key suppliers, and front-line workers. This requires an integration of both theoretical and practical knowledge of product design and production processes for management and for front-line workers as well.

Finally, world-class manufacturers are using multiskilling job rotation, and are crosstraining within broader job classification and internal career systems to promote worker flexibility, teamwork, and continuous worker training and upgrading. This approach is accompanied by increased employee involvement, decentralized decisionmaking, and self-managed work teams. Front-line workers are increasingly being given more responsibility in planning, executing, and evaluating their own work within these self-managed work teams.

These major workplace changes will require front-line workers to have stronger academic skills in science and math and stronger technical skills in areas such as electronics and computers. These new basic skills emphasize traditional reading, writing, and math skills as well as traditional concepts of work attitude and responsibility. In addition, they emphasize knowing "how" to learn and an overall adaptability through critical thinking and problem-solving skills, communication skills, and interpersonal skills necessary for team-building and group leadership.

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<sup>1/</sup> This material is drawn from Robert E. Sheets, "Work Force Preparation for the New Economic Environment" in *Shaping the Great Lakes Economy*, published by the Federal Reserve Bank of Chicago, The Great Lakes Commission and the Institute for Development Strategies at Indiana University (October 1992).

## **Building a World-Class Work Force: Germany Versus the United States**

American companies must create new types of learning organizations that utilize front-line workers to gather, create, and apply knowledge in all aspects of the organization. These new types of learning organizations must balance the traditional learning from the top down with continuous learning from the bottom up in which all front-line workers are actively involved with fellow workers, managers, suppliers, and customers in improving the organization's competitiveness. This will require new internal education and training systems that build "bottom up" learning capacity. Based on leading research in cognitive science and work-based learning, these new training systems should be based on new forms of work-based learning that integrate academic, technical, and basic skills through authentic workplace applications. This will also require new career systems in which workers are trained and developed from the bottom up so that managers and engineers have a strong practical understanding that can be used to work cooperatively with front-line workers.

This alternative approach for building a world-class work force is perhaps best illustrated by comparing Germany and the United States. The German apprenticeship system has been widely recognized as one of the leading school-to-work transition systems among our major international competitors. In contrast, American manufacturers have largely dismantled their traditional apprenticeship programs for manufacturing engineers and lower-level industrial managers. The graduates of these traditional internal training programs are now retiring and leaving the industry. Most manufacturers now rely on informal, on-the-job training systems for these critical occupations or have opted for university-trained engineers and managers with very little exposure to front-line production and front-line workers. This shift means the work force is not fully prepared for world-class manufacturing based on decentralized flexibility. Few industrial managers and engineers have the practical training to work cooperatively with front-line workers in continuous product and process improvement. They simply do not know how things are made, and they do not know how to work with front-line workers. Front-line workers are also hampered by their lack of theoretical training and the basic skills necessary to solve problems and improve processes in teams with managers and engineers. There simply is not enough common ground between managers, engineers, and front-line workers to implement modern manufacturing practices for the world-class workplace.

## **Public-Private Strategies for Building a World-Class Work Force**

This emerging training system is based on workplace-based training for both youth and adults, the expanded use of the growing private sector training industry, and the improved coordination between the public and private system.

The first major challenge is how federal and state governments can encourage businesses and industries to establish new training and career systems in the workplace that provide training to front-line workers. Currently, most formal training investment within companies is directed at managers and technicians. The challenge is to change both the level and focus of private training investment to include front line workers.

The second major challenge is how to expand the utilization of workplace-based training systems for educating and training school age youth and how to promote an alternative pathway to four-year colleges and universities based on bottom-up training systems. The most promising developments in this area are the implementation of Tech Prep and youth apprenticeship programs. The American Tech Prep model emphasizes integrating academic and vocational education with a strong emphasis on applied academics within vocational programs. It also emphasizes the linkage to further education. Tech Prep students are given the necessary academic education in high school to continue toward a two-year or four-year post-secondary degree. The American youth apprenticeship model, fashioned from European apprenticeship models, emphasizes the private sector's central role in providing workplace-based training through formal internal training systems based on formal learning objectives and industry-wide standards.

The federal and state government invest heavily in adult education and vocational training; this public investment accounts for only 50 percent of all organized instruction in the United States. The other 50 percent is financed and delivered through a variety of private sector organizations including companies, labor unions, professional associations, proprietary schools, training vendors and consulting firms. The bulk of the government's investment is in highly regulated degree markets with largely public sector training providers such as secondary schools, community colleges, and universities. The bulk of the private investment is in non-degree instructional programs that operate in largely private unregulated markets. How do we begin to coordinate these diverse training systems? One possible answer is to develop national-state skill standards systems that define national skill standard for all public and private training programs. These national systems are already being developed by our major international competitors such as Germany and Japan. Recently, the U.S. Departments of Education and Labor funded thirteen industry projects ranging from retail trade to metalworking as they worked to develop industry-based systems of occupational skill standards and certification.