

**Technology Transfer: Continuing Education's Hidden Treasure  
for the 21st Century**

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The 1990s are a decade of ambiguity. American prestige has reached a new high as a result of Desert Storm. The potential for world peace has been enhanced by the breakup of the monolithic Eastern Bloc. Yet, as the recent election reflected, continuing recession, workers incapable of implementing ever-changing advanced technology, and a seemingly uncaring federal government herald change.

**The Challenge**

The problem is summarized by the U.S. Congress's Office of Technology Assessment (OTA). American companies, they suggest, will have to spend significant time and money training employees who, while employed, lack the basic skills needed to perform effectively. The OTA considers American corporations to be "remarkably underdeveloped" when compared with the nation's leading international competitors.

In April 1991 President Bush released a plan for

responding to the need for worker development. *America 2000* is a long-range plan designed to overcome the problems besetting American society. Along with *America 2000*, the President requested that all cabinet officers conduct reviews to identify implementation strategies. The Secretary of Labor, Lynn Martin, established a Secretary's Commission on Achieving Necessary Skills (SCANS). The group's report, *What Work Requires of Schools*, suggests that an American educational revolution is needed (Brock, 1991). We must "create an entire people trained to think and equipped with the know-how to make their knowledge productive" (p. 31). The plan is clear. A three-part foundation of communication skills, thinking skills, and personality qualities is designed to make five competency areas operational: resources, interpersonal skills, information, systems, and technology. Martin's design is appropriate. If the challenge of the 1990s is to be met, America's work force must be given the opportunity to achieve its potential. Who are these individuals in the work force?

**Who: The People in the Process**

The demands facing the American public school system are obvious. Not so clear is the status of the nation's work

force. In 1989 the Department of Labor released a report entitled *Labor Market Shortages* (McLaughlin). An important finding of the report is that 80% of all workers who will be employed in the year 2000 are already in the work force (p. 8). These individuals must have the opportunity to align their skills and knowledge with the demands of advanced technology.

The OTA report identifies an expanding gap between the lower tier of poorly paid, unskilled and semi-skilled workers and an upper tier of technology and professional workers. As the need for a universal skill base increases, the need to make training and retraining available to the former group becomes evident. The management consulting firm A. T. Kearney has taken a comprehensive interest in how the process might be developed.

*In Workplace 2000: The Revolution Reshaping American Business*, Bagette and Conn of A. T. Kearney present a design that would create partnerships between education and business. The goal is innovative programs to help improve the quality of education and training. Emphasis will be placed on enhanced skills in the areas of communications, mathematics applications, and technology designs. Is there

an educational agency well suited to implement the partnership process?

**Where: The People's College**

America's community colleges are uniquely suited to develop education/business partnerships. According to the Institute for Future Studies at Macomb Community College (MI), "Our schools *can* produce quality workers. Preparing the new age worker...requires that corporate America [select] the work force strategy" (Lorenzo & Banach, 1991, p. 6).

The challenge has been articulated: we must develop "world class" workers capable of meeting the demands presented by the advanced technology of the 1990s. The individuals most in need of assistance are those already employed along with the out of school, unemployed, and underemployed. The procedure is a partnership between community colleges and business. What strategy is best suited to making the partnership concept viable? **Strategy:**

**Technology Transfer**

Technology transfer is a relatively new phenomenon. Significant attention has been paid to the development of advanced technology in America's research universities and

industrial research and development settings. How this technology was to reach the application centers and be transmitted to the workers who would implement it was unclear. Community colleges have begun to emerge as centers of technology transfer and training. Brient-Smith (1991) reports that community colleges provide education, training, and consultation services designed to enhance awareness and promote the identification and adoption of advanced technology appropriate to the colleges's service area. Special emphasis is placed on rapid response and training delivered at a level useful to the trainee.

Hull and Parnell (1991) propose a national model in *Tech Prep Associate Degree: A Win/Win Experience*. They recommend that adult [learners] upgrade their academic foundation and then build new technical skills on the upgraded and receptive base. Further, special attention must be given to maximizing effectiveness and enhancing the ability of the participants to apply the content of training to their job environment. For technology transfer to work, a process specifically developed to meet the unique mix of advanced technology, worker skill development, and quick response had to emerge. Such a process is available.

**The Process: Transformations**

The Transformations strategy was designed by the Center for Occupational Research and Development (CORD), Waco, Texas. The approach includes three phases of "hands-on" applied learning resulting in job-related skills and a broad base of technical knowledge. The elements are pre-tech, tech core, and tech specialty. The first two elements function as a common core of technical expertise to be mastered by all participants. The last is tailored to meet the advanced technology needs of the people being served. The entire program consists of between 540 and 620 hours of classroom and laboratory instruction.

The process is designed to rebuild the academic and technology foundation of shop-floor technical workers. The design uses a progression from basic concepts through specific applications to specialized technical expertise to overcome the technological illiteracy syndrome (Hull & Parnell, 1991). Applications in Texas, Ohio, and Michigan suggest that the model is effective with nontraditional students.

The responsibility facing community colleges is to integrate Transformations as a "bridge program" within their

technology transfer strategy. Integration will insure that the institutions continue to meet the needs of all sectors of their client base. Further, inclusion will ensure that the institutions are effective in developing the advanced technology work force for their service area. Table 1 describes the process of integrating a "bridge program" into a tech-prep curriculum (L'esperance, 1991). Is there a vehicle within the community college delivery system that is ideally suited to applying the Transformations process?

### **Bridging the Gap**

CORD has provided a blueprint for community colleges to tailor a bridge program for special populations and to meet community needs--Transformations. The Transformations program offers students the opportunity to learn or relearn skills and information needed by today's technological work force. The CORD approach uses an applied, hands on method of teaching traditional subjects such as general physics and elementary algebra.

Therefore, students who learn differently from those who took these courses in high school are able to grasp the concepts more easily. This applied method has proven effective for teaching women nontraditional subjects.

Several resources were pulled together to design Hagerstown Junior College's (HJC) Transformations program: CORD'S curriculum design; funding from the Maryland State Department of Education, Division of Career and Technology Education; and HJC's single parent and homemaker project. The program was designed to enable students to obtain entry-level employment and/or enter an associate in arts degree program in mechanical or electrical engineering. The standard CORD program was adapted to meet the academic needs of single parents and displaced homemakers. By adding a keyboarding, math brushup, and studies skills course to CORD'S model, the 540-hour program was expanded to 620 noncredit hours of study. This 620-hour program meets the criteria for Pell grant eligibility, insuring a solid tuition base for students. In addition, by using Pell grants for tuition, guidelines for using vocational education funds (providing services to those most needy) are guaranteed through a federal certifying agency--United States Department of Education-Student Financial Assistance Programs.

As a part of the sex equity grant, vocational education funds were provided by the Maryland Division of Career and

Technology Education. HJC hired a part-time program coordinator, purchased instructional materials for start-up purposes, and coordinated the CORD curriculum with the regular HJC engineering technology curricula. Because the program is providing nontraditional career training opportunities for single parents and displaced homemakers (most of whom are women), this project was eligible for Carl Perkins Vocational Education dollars. The project coordinator established an advisory committee made up of community agencies and employers.

Historically, advisory committees have worked with educational agencies by assisting in marketing the program to the target population. The advisory committee also provided feedback on the effectiveness of recruiting practices and methods of monitoring participant progress, and served as a coordinating body between the community and the college. A major task for the Transformations advisory committee was to assist in choosing the specialty courses that comprise the last 20% of the program. The selection was based on the needs of the local job market.

HJC is the ideal setting for a Transformations program as we have a relatively new Advanced Technology Center that

supports associate degrees in engineering technologies as well as a bachelor's degree through the University of Maryland's microwave link. Much of the equipment to run Transformations is already in place (computers, electronic equipment, some computer-driven trainers for the Principles of Technology course); therefore, implementation costs are reduced.

Currently, HJC offers credit associate in arts degrees in mechanical and electrical engineering technologies. These programs, which are taught in a traditional manner, are very demanding academically, particularly in math and science. The ability to pass technical physics seems to serve as a sifting device to separate those who will succeed in obtaining a degree and those who will not. The core course in the Transformations program is Principles of Technology-applied physics. In some places this course is a year long and is taught on a high school level. At HJC it is used as a one-credit orientation course for the engineering technologies. Teaching Principles of Technology on a noncredit level with extended hours (120) has provided a more complete understanding of physics for the nontraditional student.

Another CORE course is Applied Mathematics. The course content is related to high school Algebra I. However, the applied approach to teaching math is quite different from the traditional approach. It includes demonstrations on how computation and analytic skills are used in the workplace, using problem-solving techniques through hands-on, activity-centered course materials. Calculators are used to solve problems with scale drawings, ratios and proportions, and statistics. Since the math and science are traditional stumbling blocks for women and for nontraditional students, Transformations is ideal for developing the skills necessary for the Workforce 2000.

**Conclusion: Community Services and Technology Transfer--Unveiling  
a Vision**

In 1988 AACJC formed a commission on the future of community colleges. The commission's report, *Building Communities: A Vision for a New Century*, presents the role of community services in community colleges eloquently. "We define the term 'community' not only as a region to be served, but also as a climate to be created" (Commission on the Future of Community Colleges, 1988, p. 8). Community services, therefore, will "perform a convening function"

through which the needs of various clients and interest groups can be identified, aggregated, and met (p. 8). The creation of a climate of response to advanced technology through technology transfer is the essence of the role.

President Bush's joint statement with the nation's governors is precise. "We have started down a promising path. We have entered into a compact--a Jeffersonian compact to enlighten today's [citizens] and the children of generations to come. The time for rhetoric is past; the time for performance is now" (Brock, 1991, p. 66). If community services educators unearth the hidden treasure of technology transfer through Transformations, they will lead the process. We suggest, if not us, who? If not now, when?

**References**

- Brient-Smith, E. (1991). Responding to industry demands: Advanced technology centers. *Community, Technical, and Junior College Journal*, 62(2), pp. 20-21.
- Brock, W.E. (1991). *What work requires of schools: A SCANS report for America 2000*. Washington, DC: U.S. Department of Labor.
- Commission on the Future of Community Colleges, (1988) *Building communities: A vision for a new century*. Washington, DC: American Association of Junior and Community Colleges.
- Hull, D., & Parnell, D. (1991). *Tech-prep associate degree: A win/win experience*. Waco, TX: The Center for Occupational Research and Development.
- L'esperance, L. (1991). Are we moving toward advanced skills in TPAD? *Connections: The National Tech-Prep Network Newsletter*. Waco, TX: Center for Occupational Research and Development.
- Lorenzo, A.L., & Banach, W.J. (1991). *The top ten issues facing America's community colleges: 1991*. Macomb, MI: Institute for Future Studies.
- McLaughlin, A. (1989). *Labor market shortages: Report of the*

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Labor.

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