

# FORTUNE

## TRAINING WORKERS BETTER, FASTER, AND CHEAPER

by Gene Bylinsky

*Following is a condensed and annotated version of an article in which MTS and several of its customers and affiliates are featured.*

....Jerry Jasinowski, president of the National Association of Manufacturers, says that increasing the productive potential of America's factory employees is "challenge No. 1." The total number of U.S. factory workers is expected to remain flat or increase only slightly in years to come. But because of impending retirements, teaching new recruits—by live instruction or, increasingly, by computer—will be a monumental task. Despite the growing numbers from community colleges and technical institutes, most new hires have only a high school education. They need to learn ever faster, increasingly sophisticated production methods as well as OSHA safety rules and the process and quality controls required of companies that want certification under the ISO 9000 standards.

A recent University of Michigan study estimates that half of today's automobile workers will start drawing pensions by 2003, leaving 240,000 vacancies to be filled. In growth companies like Motorola, which expects to hire 120,000 production workers in just the next five years, the task is not only to teach waves of newcomers but also to retrain those already on board to make redesigned products. Patricia C. Barten, vice president and general manager of Motorola's cellular phone and pager division in Arlington Heights, Illinois, says that about 5% of her work force is constantly in training. Says she: "If I can't move somebody to a new job within a week, we won't survive."

In the quest for efficiency, industry is making some of the biggest changes in traditional classroom instruction, still a must for many types of training. At companies like Westt, classroom teaching has been stripped down to a bare minimum of ad hoc problem solving. Not long ago a question arose: how to machine parts to an accuracy of 0.0004 of an inch in three dimensions and measure the accuracy? In a small classroom, Craig Lewis, vice president for engineering, spent about an hour explaining the general principles of 3-D measurement to three machinists by drawing diagrams on a whiteboard with colored markers. Then he accompanied the machinists to the quality control room, where they tested their newly learned measuring ability on parts they had already made. End of short course.

At Motorola University, the electronics company's big education and training facility in Schaumburg, Illinois, boring lectures are out, and instructors play a passive role in many classrooms. Assemblers are essentially self-taught on 3-D virtual-reality simulators, in which production machinery quits functioning if the trainee fails to supply it with enough virtual parts; instructors are on hand mainly to answer questions. In an adjoining classroom, an instructor stands ready to help would-be software writers who are learning by the method that educator John Dewey said a century ago was best: by doing. In this case, the trainees practice writing instructions for tiny working robots, similar to those used to assemble pagers and cellular phones, which can pick up plastic cubes and build structures from them. Says Sanjiv Patel, Motorola U.'s manager of advanced manufacturing technology training: "Traditional classroom instruction is giving way to active, laboratory-like training by the learners themselves."

Teaching is changing even more at Ford Motor Co. "There isn't a traditional classroom anymore," says Renee S. Lerche, the company's director of education and training. "It's now everywhere at Ford. It's on the line; it's actually in the workplace." Some subjects still require teacher and classroom and always will, Lerche says, but the setting can be anywhere. Right now, for example, Ford is informing workers about its new product-devel-

opment system in meetings that allow them to react and ask questions. To overcome some workers' deficiencies in basic skills, Ford bypasses the classroom by sending instructors right to the assembly line. At its Dearborn engine plant near Detroit, public school math and English teachers help workers on the spot with math-based quality-control problems and in writing suggestions.

Ford has a better idea for another old training standby: using hands-on models of the equipment workers will operate in the plant. The company's training centers boast small portable versions of assembly lines and other production facilities. At the Huron training center in New Boston, Michigan, which Ford operates jointly with the United Auto Workers union, machinists and other workers train on full-size versions of the equipment they'll be using. To broaden its reach, the center is looking at the possibility of transmitting learning materials to remote plants by satellite.

One-on-one apprenticeship, another age-old training technique, is recorded on Egyptian wall paintings. But the search is on for ways to impart knowledge faster, even when computers don't play a big helping role as they do at Westt. In the past, says Vicente F. Estrada, the Cuban-born CEO of Manufacturing Technology Strategies (MTS) in St. Louis, "the quality of training depended on how the mentor felt at 3 A.M. on the night shift." Founded 30 years ago, with clients ranging from AT&T to Texaco, MTS has made apprenticeship more systematic by devising a rigorous skill-assessment test that painstakingly measures each worker's knowledge and uncovers gaps to be filled.

Along with the test, now available in computerized form, MTS can provide both instructors and props for on-site training. It has been using all three to prepare 100 newly hired industrial technicians—Nineties-speak for blue-collar workers—to operate a plant that Eastman Chemical Co. is building in San Roque on Spain's Costa del Sol, within view of the Rock of Gibraltar. Since the workers have to be trained before the plant is finished, MTS has flown in Spanish-speaking instructors from affiliates in Mexico and

Colombia, who have demonstrated actual pumps, control systems, piping, and motors that the training company air-freighted from the U.S. When the plant goes online this fall or next spring, MTS promises, the trainees will be ready to run it....

...David Shaw, CEO of Computer Enhanced Learning<sup>1</sup> of Slippery Rock, Pennsylvania, says his company will incorporate the mock disaster into some of its Process Control Training programs, which are already used in the paper industry and elsewhere. At present, the worst that can happen in the company's software is a thunder clap-like "cavitation" noise when, in an unrelated situation, a trainee damages a pump by allowing insufficient water flow. Fred Nolan, who works at a paper plant owned by Canada's Abitibi-Price learned the ropes using Computer Enhanced Learning's software. The program showed him the right way to manipulate valves and other instruments to control liquids flowing through a network of pipes that appears on the PC screen. "This presentation was quite a revelation to me," says Nolan. At Abitibi-Price's mill in Iroquois Falls, Ontario,<sup>2</sup> human-resources manager Don McCroome says that by using U.S. consultants and training tools, the company expects to break out of the middle of the pack and become a top player in the paper industry. Says McCroome: "Today everybody can buy the same technology and make high-quality products. Your better-trained work force is your only competitive edge."

CD-ROM training programs don't come cheap. Depending on how elaborate a show your company wants to put on, an hour's worth of instruction can cost \$15,000 to \$200,000 to prepare, and design companies charge accordingly. For a relatively modest \$15,000, a company can buy "authoring" software from Warren-Forthought in Angleton, Texas,<sup>3</sup> that enables it to write its own programs in-house. One enthusiast of the do-it-yourself approach is Wayne Huckeba, training manager at Citgo's huge petroleum refinery in Lake Charles, Louisiana. Huckeba says he's saving \$250,000 a year by substituting interactive PC training for classroom instruction.

Another user of Warren-Forthought software, Amoco's big Cooper River chemical plant near Charleston, South Carolina,<sup>4</sup> created a program to teach OSHA safety standards. Dennis J. Charles, the plant's maintenance training coordinator, says it has eliminated on-the-job injuries. Linda Casey, who until recently was a maintenance technician at Amoco, found its software superior to the training she received at a Navy yard, her previous employer. At the Navy yard, Casey recalls, "you had to sit in a classroom for three or four hours, even if you didn't need the information. At Amoco, if you're familiar with some of the material, you can move on to other things." While some of her training took place in the classroom, Casey says, "in my first two weeks at Amoco, I learned all the OSHA safety regulations on the computer."

In the new world of training, in short, computers and teachers needn't be enemies. Given those legions of raw recruits who will be swarming into industry, both will have their work cut out for them.

1 Computer Enhanced Learning (CEL) is an affiliate of MTS.

2 Abitibi-Price is a customer of MTS.

3 Warren-Forthought is an affiliate of MTS.

4 Amoco, Cooper River is a customer of MTS.

For more information contact:



11426 Dorsett Road  
St. Louis, MO 63043-3414  
Phone: 314-298-0004  
Fax: 314-298-0006  
Websites: [www.mtsworld.com](http://www.mtsworld.com)  
[www.mtselearning.com](http://www.mtselearning.com)