Educational system and training programs should be adjusted.

The baby boom generation, the last one that produced significant numbers of craftspeople, is retiring. Between the retirements and the scarcity of entry-level craftspeople, we have a severe and accelerating crisis—a nationwide shortage of technically qualified people for our manufacturing industries.

It is a dual shortage:

1. a shortage of qualified, technically skilled managers to supervise plants, and
2. a shortage of qualified, technically skilled craftspeople to operate and maintain plants.

If present trends continue, our deficit in skilled, educated people to operate and maintain manufacturing facilities will worsen at a time when technological change continues to make plants more automated. Exacerbating this trend, transfer of knowledge from seasoned professionals to their replacements happens less and less.

Solving our nation's skills shortage requires a change in the way we think about manufacturing-related employment. It also requires changes in the ways we educate and train people for such employment. In assessing how well we are meeting our workplace skills needs and finding ways to meet them better, we need to examine our educational system and company-provided training programs.

Educational system has possible solution

Traditionally, we have expected the U.S. educational system to produce people with the skills we need in the workplace. The educational system may be our best ally in finding ways to expand our pool of skilled people for automated manufacturing and thus get our production capability back on track. To move in this direction, we need to seek ways to better use this important resource.

One way to gain workplace skills is tuition reimbursement programs—companies' conventional answer to the skills shortage. Often, companies offer tuition reimbursement, widespread in employee benefit plans, as an incentive for workers to pursue additional education and training. Management hopes many who are reimbursed for individual courses will continue their studies and eventually obtain degrees.

Tuition reimbursement programs are helping us get the skills we need back into the workplace. However, not enough employees are taking advantage of these programs to make a large enough dent in our skills shortage. One reason: pursuing a degree under a tuition reimbursement program requires a huge commitment of time and energy—particularly difficult for those with families. We need to interest more employees in using this important resource.

When employees pursue college degrees under tuition reimbursement programs, some of their courses help create skills applicable to automated facilities and some do not. Early in their college careers, instead of technical courses, students take courses required for graduation: English, philosophy, history, sciences, mathematics, foreign languages, etc. These studies are important but have no direct effect on reducing downtime or troubleshooting a machine.

In the later years of college, engineering students encounter some courses covering the technology in manufacturing. However, they may not be hands-on, may be too few, and may not be rigorous enough to develop workplace skills. By the time an electrical engineer graduates from college, for example, he or she has taken a limited number of electrically focused courses—possibly as few as six or seven.

It seems clear that our educational system, while it is a valuable resource in providing part of the solution to the skills shortage, may need adjustments increasing its ability to get the job done. But there is a second educational option that deserves attention.

Another educational option

A second option for those seeking additional education through tuition reimbursement is pursuing studies toward a degree at a technical college. It has some advantages over the conventional college degree track.

On the plus side, technical schools focus on knowledge the student will need on the job. But here again, a substantial individual time and energy commitment is required. Technical studies, combined with several years of hands-on training and continuing education, can enable an individual to achieve proficiency. If the student wants to go beyond a technical college degree, though, there is a problem—technical college credits are seldom transferable.

The main accrediting bodies for technical institutions are the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC of ABET) and the Accrediting Commission for Career Schools/Colleges of Technology. In both cases, acceptance of credits is limited (one course in 10 or fewer) at universities. That means the student must start over. Technical schools might consider pursuing a strategy to achieve more widely acceptable accreditation.

Most companies find achieving a skilled workforce requires more than sending employees out to take courses under tuition reimbursement programs. Many companies have developed proactive strategies to participate even more directly in meeting their needs for skilled employees in the workplace.

Company-sponsored training effective

Company training programs are proving effective in achieving technically competent workforces. Ideally, company training programs and educational institutions can work hand in hand. Many are combining formal training programs with on-the-job training and apprenticeships in a coordinated effort to fill the skills gap.

Training programs offer seminars on hydraulics, pneumatics, PLCs with focus on maintenance, and troubleshooting. Their courses provide useful technical knowledge of equipment employees may be called upon to troubleshoot.

Ideally, this training occurs on the job or in a classroom using hands-on training modules. When employees are trained at an operating site, the class often works with the site's production and maintenance equipment. If the site has a persistent problem, the training class seeks a solution using its developing troubleshooting skills.

Experience shows such hands-on training provides a measurable improvement in employees' technical knowledge, leading to measurable reductions in downtime and accidents. These improvements can be worthwhile for companies, which receive a return on investment reportedly reaching 10 to 20 times the dollars spent providing training, together with the intangible benefits of consistent production and fewer employee injuries.

Companies wishing to achieve these returns first should do a training needs assessment. This assessment compares a company's situation with a training model and identifies what overall training programs a company requires and what specific seminars within those programs will enable it to meet its objectives.

In-house vs. outsourced training

Companies planning to begin or expand training programs generally consider two options: in-house training departments or outside training experts. Companies should look at both options carefully, keeping in mind the need for a thorough training needs assessment and for careful planning to minimize safety risks and assure compliance with applicable regulations.

Many companies have excellent in-house departments able to meet a broad range of training needs. In-house training experts can focus on the particular technologies and training situation of the company. They can stay attuned daily to the company's changing training requirements and operate within key company facilities, enabling them to emphasize hands-on training in their courses.

Working with outside training experts has its advantages, too. Outside training contractors can offer public seminars or customized onsite seminars featuring hands-on training. These companies often have unique experience or expertise to supplement what in-house training departments may lack. Good outsourcing training providers know how to make the best use of:

• Cross training. Because all mechanical systems have electric or electronic circuitry, both electrical and mechanical skills are required to troubleshoot equipment. Cross training can help assure prompt troubleshooting, high skill levels, and smoothly running plants. Only trained experts, however, should attempt its use. Outsourced training providers can determine when cross training can safely be used and when skilled specialists are needed.

• OSHA-based safety training. Outsourced training providers can determine how best to achieve compliance with Occupational Safety and Health Administration (OSHA) regulations and other applicable safety procedures. These experts routinely study OSHA interpretations, surveying the latest in safety regulations and best practices to incorporate the best thinking into training programs.

Today, outsourced training providers seek ways to enrich the value of training programs for trainees pursuing degrees through tuition reimbursement programs. They do so by working with community college systems to achieve accreditation, enabling transfer of credits earned in company-sponsored training to universities and other institutions of learning. One organization that can provide this benefit, and does so in cooperation with outsourcing training providers through an “extension campus,” is the North Central Association of Schools (NCA). Technical colleges might consider a similar strategy for expanding transfer credit acceptance.

When deciding whether to emphasize in-house training departments or working with outside training experts, many companies opt for both. Given today’s head count restrictions, it is often difficult for a company to staff an in-house group to meet all training needs, which tend to vary over time. And it is not easy for in-house training experts to keep up with all the changes in technology, regulations, decisions, interpretations, etc., that happen constantly.

The solution is often use of in-house training experts for most day-to-day and routine training needs and for seminars on the equipment the company has in place. But in cases involving special or unusual training needs or new equipment, companies often decide that outside contractors can provide a needed assist to the in-house group.

Making the best use of our education and training capabilities

Training programs offered by companies, together with our U.S. education system, provide our two best chances to solve the skills shortage in manufacturing. If our economy is to prosper, both areas must work together to facilitate creation of a technically capable workforce. The only way to combat the $1.68 hourly wage overseas is to develop a trained, skilled workforce able to troubleshoot and maintain smooth operation of automated plants.

The answer to the dilemma is two-part:

• Adjust our educational system to create new incentives promoting technical education and making technical education easier to pursue.
• Intensify our use of company-sponsored on-the-job training by offering hands-on technical training seminars and programs.

We need to move boldly and decisively to accomplish both tasks. Then, we will find ourselves

well on the way to solving our national skills shortage. Our ability to support manufacturing is contingent on having the technical competence to create and market truly world-class products. **MT**

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