

## **Chapter 5**

# **Delivery of Training by U.S. Firms**

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## Chapter 5

# Delivery of Training by U.S. Firms

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### SUMMARY

U.S. companies spend billions of dollars each year to train workers. Still, the extent and quality of training vary dramatically, and firms seldom evaluate their efforts. Only 35 percent of workers say they had any form of training while at their current job.

As interest and investment in training grow, a few pioneering companies, large and small, are designing training programs to support strategic corporate goals. These firms often find that new instructional technologies can deliver high quality training at less cost than traditional teaching methods. Both efforts—to systematically integrate training with business strategy and to apply instructional technologies—are still in their infancy, however. (See ch. 7.)

New training organizations and support structures, including State assistance programs and industry consortia, are emerging. While these sources promise to enhance the scope and quality of training, their efforts are fragmented and not widespread.

While the data are poor, recent estimates of the total annual employer investment in formal classroom training range between \$30 billion and \$45 billion. Expenditures on informal on-the-job training could be greater, because few U.S. workers receive training in a formal classroom or laboratory setting. Most on-the-job training is unstructured—left to chance. Some U.S. firms have found that rapid technological change increasingly requires workers to have broader, more theoretical job knowledge that can be provided best through formal training. (Formal and informal training can be merged at the worksite through job aids, simulators, and other new forms of instructional technology).

Formally or informally, U.S. employers provide little training partly out of fear that well-trained employees will sell their skills elsewhere for higher wages. Human capital theory and subsequent empirical studies suggest that employers can use a variety of mechanisms to protect themselves from such risks. There is some evidence that the most highly trained workers are those least likely to quit or be laid off. Still, the fear of losing their investment as well as a lack of training knowledge and experience

make many managers reluctant to spend major sums on formal or structured informal training.

U.S. workers receive training from many sources: colleagues and supervisors, in-house training departments, equipment vendors, private training companies, and public and private schools and colleges. When firms introduce new technologies and redesign jobs, they rely primarily on in-house training and training by equipment vendors. Once job descriptions become well-established, educational institutions provide more of the training.

The quality of training delivered by these sources varies greatly. In many companies, the in-house training department is seen as a wayside within the corporate hierarchy, and rising young executives hope not to be placed there. Outside sources, in contrast, are eager to serve client companies. However, many equipment vendors give only cursory training to a small group of employees—the vendor's first concern is selling equipment. While many schools and colleges can provide more comprehensive, general training, employers see it as more than is actually required, and may not want to pay for it. Alternatively, there is a huge maze of for-profit training companies and consultants—3,500, by one estimate—and no way to judge their quality except by word-of-mouth. They sell both high quality products and services and untested, off-the-shelf training materials.

Over the past two decades, the States have expanded their business development efforts to include modest support for training. Today, State investments in worker training are aimed not only at wooing new firms to boost the State economy, but also at inducing existing employers to create new jobs or to avoid layoffs.

By the 1988-89 fiscal year, 44 States operated 1 or more company-customized training programs, with annual budgets totaling about \$375 million. In addition to these formally budgeted programs, a few States have spent large sums on training as part of a package of incentives to attract new industries, especially new auto plants. Many State-subsidized educational institutions also provide customized training for employers on an ad hoc basis outside of any formal, statewide program.

Despite this growing investment, few States have evaluated their training efforts. One preliminary study indicates that State assistance has played a positive role in achieving the goal of enhancing the competitiveness of existing firms.

Small employers, who are most in need of training assistance, often need better technology and improved management techniques as well. However, current State technology assistance programs (which provide consulting services to firms seeking to upgrade their hardware, software, and management systems) are limited in scope and poorly linked with State training assistance. Neither State technology assistance nor State training assistance programs are adequate to meet growing employer demand. "One-stop" training and technology assistance for small employers lost in the jungle of public and private training providers is available only in Michigan, Massachusetts, and a few other States.

Growing State involvement in worker training raises important policy questions. Perhaps most fundamental is: Should government intervene in the training marketplace, and what criteria should govern its assistance given that State resources will never be adequate to aid all firms? Closely related is the question of substitution: Are companies using State training funds to support nontraining activities? If the money is being used correctly, would the firms have trained their workers anyway in the absence of State subsidy?

Raising these questions may be less necessary if companies are required to prove financial need and are limited to subsidies for formal training or systematic on-the-job training (such as trainers' salaries while on the shopfloor) which can be clearly identified as training time.

## HOW MUCH TRAINING IS DELIVERED?

Accurate estimates of the extent of worker training do not exist. There are several reasons:

- Few firms respond to surveys; only a handful of firms keep track of training expenditures and these firms account for training costs in very different ways.<sup>1</sup>
- In employee surveys, workers' memories and perceptions of training events maybe unreliable.<sup>2</sup>
- Employers more often train their workers informally on the job than in formal classrooms, making it hard to differentiate between "training time" and "work time."<sup>3</sup>

Not surprisingly, therefore, estimates of the total employer investment in training vary greatly. (See table 5-1.)

Estimates of U.S. employers' investments in *formal training* range from \$30 billion to \$44 billions While these estimates could be off track, there is no doubt that employer-provided training is a large enterprise. How large is a matter of interpretation. The \$44-billion estimate is less than 1 percent of 1988 Gross National Product (GNP) (\$4.88 trillion). Averaged across an employed workforce of 114 million, investments in formal training are, at most, \$385 per worker per year.

In contrast, the total cost to educate America's 58 million full-time students (those in primary, secondary, post-secondary education) in 1987<sup>4</sup> was about \$311 billion<sup>5</sup>—\$5,400 per student, or 13 to 20 times greater than the amount spent on workers. Because training is only a small component of most workers' jobs, its costs should not be nearly as great as those of the full-time education of students.

<sup>1</sup>Ann P. Bartel, "utilizing Corporate Survey Data to Study Investments in Employee Training and Development" discussion paper for the National Assessment of Vocational Education, February 1989.

<sup>2</sup>Nell P. Eurich, *Corporate Classrooms* (Princeton, NJ: The Carnegie Foundation for the Advancement of Teaching, 1985), p. 7.

<sup>3</sup>Anthony P. Carnevale et al., *Best Practices: What Works in Training & Development—Organization and Strategic Role*, report prepared for U.S. Department of Labor (Alexandria, VA: American Society for Training and Development March 1989), p. 36.

<sup>4</sup>U.S. Congress, Office of Technology Assessment, *Technology and the American Economic Transition*, OTA-TET-283 (Springfield, VA: National Technical Information Service, May 1988), p. 129.

<sup>5</sup>The most recent estimate, for 1989, is \$44 billion. This total was extrapolated from a survey of companies with 100 or more employees which received only a 16 percent response rate. The low response rate makes the accuracy of the extrapolation questionable. The survey was published in *Training Magazine*, October 1989.

<sup>6</sup>U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics 1989* (Washington, DC: U.S. Government Printing Office, 1989), p. 29.

<sup>7</sup>*Ibid.*, p. 9.

Table 5-I—Estimates of Employer Investments in Training  
(total annual investment by U.S. employers)

Author	Total (dollars in billions)	Format	Informal	Comments
Oberle (1989) <sup>a</sup> ..... NE	44.4	NE	NE	The survey was sent to 20,000 business units with 100 or more employees in early 1989; 3,130 responded for a 16 percent response rate; estimate excludes wages of trainees. Three-fourths of the total was for wages of trainers. Excludes government training.
Mincer (1989) <sup>b</sup> ..... 105-210	NES	NES	NES	This study used wages while in training as a proxy for training costs. Includes government training.
Bartel (1989) <sup>c</sup> ..... NE	55	NE	NE	The survey was sent to 7,765 business units in early 1987; 493 responded (6 percent response rate). One-third to one-half of responding units had formal training programs. Some respondents may have included trainees' wages in their cost estimates. Excludes government training.
ASTD <sup>d</sup> ..... 120-210	30	90-180	90-180	The formal training estimate is based on average training costs multiplied by the number of trainees and courses from the 1978 Current Population Survey. ASTD excludes wages of trainees and government training from its formal training estimate. The low end informal estimate is based on a Bureau of Labor Statistics survey which found that informal training was cited three times more frequently than formal training as a source of qualifying training. The high end informal estimate is based on Mincer's 1989 estimate (\$210 billion) minus ASTD's formal training estimate (\$30 billion).
Carnevale & Goldstein (1985) <sup>e</sup> .... NE	10-21	NE	NE	The study used 1978 case study survey data from 12 large firms, to determine training costs. This was multiplied by the number of courses from 1978 Current Population Survey. Includes government training. Higher estimate includes wages.
Craig & Evers (1981) <sup>9</sup> ..... NE	30-40	NE	NE	Assumes average firm spends half AT&T's 1981 average per employee training expenditure of \$1,500, and that half of all U.S. employees receive training. Includes government training. Excludes wages of trainees.

NOTE: NE -not estimated; NES not estimated separately.

<sup>a</sup>Joseph Oberle, "Training Magazine's Industry Report 1989," *Training Magazine*, vol. 26, No. 10, October 1989, P. 32.<sup>b</sup>Jacob Mincer, "Labor Market Effects of Human Capital and of its Adjustment to Technological Change," discussion paper for the National Assessment Of Vocational Education, February 1989, pp. 17,33. A December 1989 analysis by Mincer, using much the same methodology, resulted in a revised total of \$240 billion to \$330 billion for formal and informal training combined.<sup>c</sup>Ann P. Bartel, "Utilizing Corporate Survey Data to Study Investments in Employee Training and Development," discussion paper for the National Assessment of Vocational Education, February 1989, p. 5.<sup>d</sup>"Amount Spent on Training by American Businesses—Fact Sheet" (Alexandria, VA: American Society for Training and Development, no date).<sup>e</sup>Max L. Carey, *How Workers Get Their Training*, U.S. Department of Labor, Bureau of Labor Statistics, bulletin no. 2226, March 1985.<sup>f</sup>Anthony P. Carnevale and Harold Goldstein, *Employee Training: Its Changing Role and An Analysis of NW Data* (Alexandria, VA: ASTD Press, 1985), pp. 77-82.<sup>9</sup>As cited in Carnevale and Goldstein, in footnote f above.

SOURCE: Office of Technology Assessment, 1990.

However, training expenditures are also quite modest when compared with other employer investments in their workers. Forty-four billion dollars equals 1.8 percent of the total compensation that American firms and other private employers paid their workers in 1988 (\$2.4 trillion). A few companies spend amounts equal to 4 or 5 percent of their payroll on

formal training while others spend nothing. Overall, employers spent more (2.8 percent of payroll) on coffee breaks, lunch, and other paid rest time for their employees than on formal training.<sup>9</sup>

When the costs of informal training are included, cost estimates range from \$105 billion to \$210 billion or more per year (see table 5-I). However, the

<sup>8</sup>*Survey of Current Business*, vol. 69, No. 7, July 1989, table 1.14, P. 45.<sup>9</sup>U.S. Chamber of Commerce, "Employee Benefits," *Survey Data From Benefit Year 1988* (Washington DC: 1989), p. 27.

\$210 billion estimate is not comparable with the other estimates in table 5-1, because, unlike the others, it assumes that workers share in the costs of training by accepting a lower wage than would otherwise be paid during the training period.

Most informal training is unstructured, consisting of experienced co-workers and supervisors showing newer employees how to do their jobs. Such training does not compare favorably with the highly structured informal training and the growing amount of formal training provided by firms in competitor nations (see ch. 3).

### *Training in Small Firms*

Training is delivered unevenly across firms and among workers. While a few large corporations spend major sums on employee training, many small companies spend little or nothing.<sup>10</sup> Larger firms are more likely to provide structured training because they have lower labor turnover and greater access to capital to finance training.<sup>11</sup> It is also possible that the training tends to further reduce their labor turnover.

Although smaller firms invest little in formal training, they nonetheless do train their employees informally. Typically, workers at firms with less than 100 employees have greater training needs because, in comparison to workers at large firms, they tend to be less well-educated and have a less stable employment history. These needs are usually met by supervisors or co-workers informally teaching new hires.<sup>12</sup>

Strong management commitment at some smaller firms drives investment in formal as well as informal training. A few even develop their own in-house training. For example, General Tool, a family-owned machine tool job shop in Cincinnati, has a

full-time training manager who designs and delivers both an apprenticeship program and ongoing off-hours courses for the company's 300 employees.<sup>13</sup> The company defrays part of these costs by allowing nonemployees to enroll in its classes for a fee.

### *Economic Barriers to Workplace Training<sup>14</sup>*

According to human capital theory, worker training extends across a spectrum ranging from "general" training, which "is useful in many firms besides those providing it,"<sup>15</sup> to "specific" training, which is useful only in the firm where it is provided. Because firms could lose part of their return from general training investments if a newly trained worker took a job with another firm, the theory states that, although firms might provide such training, they do not pay for it. Instead, employers pay a lower wage during the training period to cover the training costs. Employees accept the lower wage because they recognize that they will benefit from the general training. Another theorem of human capital theory is that firms and workers share the costs of specific training (the workers' share is paid in the form of a wage lower than their productivity would otherwise justify) since both parties benefit.<sup>16</sup> To guard against turnover, the theory says, firms pay higher wages following specific training than would be warranted based strictly on productivity.

Some subsequent empirical studies have called both of these basic premises into question, suggesting that firms sometimes pay for general training and that firms and workers do not always share the costs of specific training. More importantly, however, these studies found that, when firms do take the risk of investing in *both* general and specific training, they are less likely to lose their investment through quits or layoffs than the original human capital theory would suggest. This suggests that, at least in

<sup>10</sup>Jerome M. Rosow and Robert Zager, *Training: The Competitive Edge* (San Francisco, CA: Jossey-Bass, 1988), p. 1.; Eurich, *OP. cit.*, footnote 2, p. 9; Sheldon Haber et al., "Employment and Training Opportunities in Small and Large Firms" (Potomac, MD: Simon & Co., under U.S. Small Business Administration Contract No. SBA-8587-AER-84, 1988), p. viii.

<sup>11</sup>John H. Bishop, "On-the-Job Training of New Hires," working paper #89-11, Center for Advanced Human Resources Studies, Cornell University; presented at the symposium on market failure in training, LaFollette Institute of Public Affairs, University of Wisconsin, Madison, May 1989, p. 33.

<sup>12</sup>"Employment and Training Opportunities in Small and Large Firms," *op. cit.*, footnote 10, p. 90.

<sup>13</sup>James Stewart, Director, Manufacturing and Engineering, General Tool Co., personal communication, May 4, 1989.

<sup>14</sup>This discussion is based on a working paper by Michael J. Feuer, OTA, "Economic Analysis of Workplace Training: Human Capital Theory and Beyond," August 1989.

<sup>15</sup>Gary Becker, *Huron Capital: A Theoretical and Empirical Analysis With Special Reference to Education*, 2d ed. (New York, NY: National Bureau of Economic Research and Columbia University Press, 1975), p. 19.

<sup>16</sup>"Economic Analysis of Workplace Training," *op. cit.*, footnote 14, p. 30.

some instances, training is less risky as an investment than many employers believe.<sup>17</sup>

A study of scientists and engineers found that those whose firms financed their general training (by paying for outside courses) earned just as much during training as those who were paying for their own education.<sup>18</sup> The same study found that quit rates were no greater among scientists and engineers whose firms paid for general training than among those who paid the costs of general training themselves, either through lower wages or by paying tuition for courses out of their own pockets.<sup>19</sup> Another study, based on a 1982 survey of over 3,000 employers, provides further evidence that firms do indeed pay at least some of the costs of general training.<sup>20</sup> To recapture some of these costs, wage rates following training were lower than the increased productivity of the workers would warrant. Despite the low wage, the workers were still unlikely to quit or be hired away by rival firms because their new skills were poorly “signaled” to the labor market—that is, rival firms were unaware of these skills and how they might benefit from them.<sup>21</sup>

An earlier study of manufacturing workers found that when workers financed a greater share of their specific training (by accepting lower wages), they were less likely to quit. When the firms paid a greater share of specific training, they were less likely to lay off the workers.<sup>22</sup>

In actual practice, firms rarely offer training that is purely general or purely specific. Instead, the two types of training blend along a continuum. Some empirical studies suggest that when general and specific training are offered jointly, turnover rates are reduced, so the likelihood of losing the invest-

ment is lowered.<sup>23</sup> More importantly, the “risk” of providing general, transferable skills may be outweighed by the benefit to the firm from increased efficiency in specific training.<sup>24</sup> Because employers are most likely to capture the benefits of specific training, and the costs of specific training are lowest when the employee possesses broad, transferable skill, the investment in general training may be worthwhile.

Both in its original formulation and in many subsequent studies, human capital theory suggests that employers can use a variety of mechanisms to minimize the real or perceived risks of training investments. Even so, some managers view training not as a strategic investment to improve human capital, but as either an avoidable expense or an expensive benefit. When profits are up, training increases; in lean years, it is cut back.<sup>25</sup>

Cost is not the only barrier to worker training. Many employers are reluctant to provide training because they do not know the best approach. Senior managers may not fit training into their plans to introduce new technology and/or new work processes.<sup>26</sup> Production managers are often reluctant to disrupt operations by releasing employees for training in the hopes of an elusive future benefit. Many inexperienced managers fear training will fail, while others who have had bad experiences with previous, ill-conceived training efforts are even more wary.<sup>27</sup>

Despite these barriers, the competitive pressures outlined in chapter 3 are forcing companies of all sizes to reevaluate their training needs. Small and mid-sized suppliers to larger companies will need better trained workers to meet the stricter quality requirements of the purchasing firms.

<sup>17</sup>*Ibid.*, p. 37.

<sup>18</sup>Michael Feuer, Henry Glick, and Anand Desai, “Is Firm-Sponsored Education Viable?” *Journal of Economic Behavior and Organization*, vol. 8, 1987, pp. 121-136.

<sup>19</sup>*Ibid.*

<sup>20</sup>Bishop, *op. cit.*, footnote 11.

<sup>21</sup>*Ibid.*

<sup>22</sup>Donald Parsons, “Specific Human Capital: An Application to Quit Rates and Layoff Rates,” *Journal of Political Economy*, vol. 80, No. 6, November/December 1972, pp. 1120-1143.

<sup>23</sup>Michael Feuer, Henry Glick, and Anand Desai, “Firm Financed Education and Specific Human Capital: A Test of the Insurance Hypothesis,” invited paper, symposium on market failure in training, LaFollette School of Public Affairs, University of Wisconsin, Madison, May 1989.

<sup>24</sup>Masanori Hashimoto, personal communication, June 1989.

<sup>25</sup>Eurich, *op. cit.*, footnote 2, p. 5.

<sup>26</sup>Peter A. Creticos and Robert G. Sheets, “Evaluating State-Financed, Workplace-Based Retraining Programs,” forthcoming report to the National Commission for Employment Policy and the National Governors’ Association March 1990, p. 56.

<sup>27</sup>*Ibid.*, p. 58.

## THE IMPACT OF EMPLOYER-PROVIDED TRAINING

A few companies have made major commitments to training. For example, International Business Machines Corp. (IBM) and Xerox Corp., spend 4 percent or more of payroll on training. Motorola, Inc. has a corporatewide policy of budgeting 1.5 percent of payroll for training and in fact often spends more (2.4 percent in 1987).<sup>28</sup> Motorola is now proposing that each employee receive at least 40 hours of education and training each year.

One recent study<sup>29</sup> urged American employers to spend 2 percent of their payroll on human resource development, with the ultimate goal of reaching 4 percent nationwide. However, simply throwing more money at training will not help firms function better.

Some companies have been able to reap substantial savings by evaluating their training programs in light of company goals. For example, in 1985, IBM's top managers found that they did not know what the corporation's total annual expenditure on training was. It took a 3-month study to reveal that IBM was spending \$900 million a year (or 4.7 percent of total compensation) on education.<sup>30</sup> Top management called for a follow-up study to determine whether the \$900 million total was justified in terms of the quality of training and its contribution to productivity.

With top-level commitment to acting on the results of the subsequent study, training was "centralized," under a Director of Education reporting to top management; training courses were redesigned, eliminated, and/or created to match them more closely to company jobs; and cost-effectiveness studies led to greater use of distance learning

technologies. A new 5-year strategic plan for education, closely linked to business goals, is now halfway through implementation, and rapidly rising training costs have been contained.<sup>31</sup>

Other companies, too, have saved money by taking a closer look at their training programs and evaluating the cost-effectiveness of alternative delivery methods. NCR Corp. (formerly National Cash Register) expects to save \$70 million per year in training costs by producing its own training materials on interactive videodisc.<sup>32</sup>

### *Effects on Job Performance*

Most efforts to strengthen the quality of training focus on improved job performance. Recent research as well as anecdotal evidence from companies indicate that knowledge gained outside of the normal job context (such as in a classroom) is difficult to transfer back to the worksite.<sup>33 34</sup> There are many reasons for this nontransfer: Training departments are often left out of top corporate planning, line managers sometimes fail to reinforce application of the newly learned skills, and, in many cases, the course itself may not be really focused on the content of trainees' jobs.

There are techniques for more closely relating training to job performance. Companies that can afford to undertake job analysis, for example, can often improve their training programs. IBM's effort to create a more responsive training system resulted in dropping many courses while adding others to match the 85 major job categories in the company.<sup>35</sup> This pruning used Instructional Systems Design (ISD—see ch. 7 for a more complete discussion) to evaluate the previously existing array of courses for relevance to the content of specific jobs. Through the

<sup>28</sup>Paul V. Delker, "Worker Training: A Study of Nine Companies," contract report prepared for the Office of Technology Assessment, September 1988, p. 47.

<sup>29</sup>Anthony P. Carnevale and Janet W. Johnston, *Training America: Strategies for the Nation* (Alexandria, VA: American Society for Training and Development 1989, p. 5). The study was jointly sponsored by ASTD and the National Center for Education and the Economy.

<sup>30</sup>Ralph E. Grubb, "Training in the Workplace: An IBM Case Study," report prepared for the Office of Technology Assessment under contract L3-2830, February 1990, pp. 12-14.

<sup>31</sup>Patricia A. Galagan, "IBM Gets Its Arms Around Education," *Training and Development Journal*, vol. 43, No. 1, January 1989, pp. 35-41.

<sup>32</sup>Robert R. Miller, "Corporate Strategy and Industrial Training," contractor report prepared for the Office of Technology Assessment under contract L3-5240, February 1990, p. 41.

<sup>33</sup>Helen Kelly, "A Primer on Transfer of Training," *Training and Development Journal*, November 1982, p. 102.

<sup>34</sup>Lauren B. Resnick, "Learning In School and Out," *Educational Research*, No. 16, pp. 13-20; and others cited in David Stern, "Institutions and Incentives for Developing Work-Related Knowledge and Skill," paper presented at the Technology and the Future of Work Conference, Stanford University, Stanford, CA, Mar. 28-29, 1990, p. 6.

<sup>35</sup>Galagan, *op. cit.*, footnote 31, p. 39.



use of ISD, the length of some courses was cut by 25 percent.<sup>36</sup>

The cost savings from eliminating “nice to know” information and keeping only “need to know” information may be substantial. However, managers seeking greater worker participation as part of their business strategy often find that the “need to know” category is quite large. According to one recent study of workplace training:

What employees need to learn, beyond their immediate assignments, depends on what the employer wants them to contribute. Leading companies . . . tell them a great deal about corporate goals and plans, the operation of the job site, the jobs of peers and managers, the functions of adjacent work units, the technology in use, effective problem-solving methods, and actual costs.<sup>37</sup>

In some cases, training does not translate into improved job performance because other steps, such as reorganization of work, have not been taken. For example, operators in a large (900-employee) east coast cookie factory received training in statistical process control (SPC), problem-solving, and troubleshooting. However, their jobs remained unchanged, so that they had little opportunity to use their new skills. Thus, the training had little impact.<sup>38</sup>

In other cases, the lack of transfer is due to a lack of post-training follow up. One study found that students were most likely to apply time management skills learned in a short course when they attended a follow-up session where they set goals for applying their new skills.<sup>39</sup>

### *Linking Training to Management Strategy*

Many observers note that training departments of large companies are often isolated from top management and that training content is often developed haphazardly, in response only to immediate needs.<sup>40</sup> Thus, lower level managers often justifiably doubt the usefulness of training because it sidetracks people from their “real” work with no apparent benefit.<sup>41</sup>

Responsibility for training is necessarily decentralized.<sup>42</sup> A 1988 survey of 12 large corporations revealed that, in all but one company, line managers controlled at least 75 percent of the total corporate investment in training.<sup>43</sup> Although local decisions are important for flexibility, company-wide training commitments may not develop without some centralized guidance. Some large corporations, like IBM, may gain economies of scale and tie training more closely to strategic goals by centralizing oversight of the entire training process at a point high on the organization chart. To be avoided is having a human resource development (HRD) department that produces training videos and courses that may not be used by operating divisions, while field managers act on their own to produce or buy a whole smorgasbord of other training services.

For small businesses, linking training to management strategy may be easier. Because most small companies cannot afford to hire a full-time trainer, there is no danger that training can be isolated from corporate goals. In fact, top management sometimes *is the HRD* department.”

Managers in many U.S. industries rank improving the quality of their products or services high among corporate goals. When the correct links are forged,

<sup>36</sup>Ibid.

<sup>37</sup>Rosow and Zager, op. cit., footnote 10, p. 14.

<sup>38</sup>Larry Hirschhorn, “Training Factory Workers: Three Case Studies,” contractor report prepared for the Office of Technology Assessment, July 1989, p. 5.

<sup>39</sup>Kenneth N. Wexley and Timothy T. Baldwin, “Posttraining Strategies for Facilitating Positive Transfer: An Empirical Exploration,” *Academy of Management Journal*, vol. 29, No. 3, September 1986, pp. 503-520.

<sup>40</sup>Thomas J. Chmura et al., “Corporate Education and Train@,” SRI International Business Intelligence Program Report No. 753, fall 1987, p. 7.

<sup>41</sup>Rosow and Zager, Op. cit., footnote 10, p. \*5.

<sup>42</sup>Richard Gordon et al., “Proposal for Creation of a Research Planning Group submitted to the Council for European Studies,” December 1988, p. 3.

<sup>43</sup>Anthony P. Carnevale and Eric R. Schulz, *Best Practices: What Works in Training & Development: Accounting and Evaluation*, report prepared for U.S. Department of Labor (Alexandria, VA: American Society for Training & Development Mar. 31, 1989), p. 149.

<sup>44</sup>For example, the owner of one small manufacturing company in Cincinnati not only budgets for formal and informal training, but also delivers much of the employee training himself. Typically, he trains the foremen and coaches them as they train the production workers. George Wiles, President, Planet Products, interview of May 4, 1989.

training can play a critical role in quality improvements.

Training has played an important role in Ford Motor Co.'s quality improvement strategy. Following massive layoffs in the early 1980s, Ford instigated an Employee Involvement (EI) process for its unionized workforce. Training in joint problem-solving took place on company time, as did a subsequent program teaching managers how to work successfully with the more participative workers.

At the same time, Ford and the United Auto Workers were jointly developing a broad range of personal development courses offered off-hours. As discussed at greater length in chapter 8, these personal development courses made on-the-job training easier by enhancing participants' self-esteem, interest in learning, and basic skills. According to Ford's former Chief Executive Officer, Donald E. Petersen, training and EI played a major role in the firm's 1986 turnaround from near-bankruptcy to record profits. Petersen, who retired in 1990, views ongoing training as a key to the continual quality improvement needed to sustain profitability.<sup>45</sup> (See box 4-D inch. 4 for further discussion of training in company efforts to improve quality.)

Training can play an important role in achieving other corporate goals too. For example, as global markets mingle, many U.S. corporations seek to increase exports. This requires employees who can operate effectively in other cultures and languages. Aetna's Corporate Education Institute provides courses in cross-cultural issues to support the company's attempt to break into foreign markets. Motorola's Training and Education Center briefs top management on the culture and history of Asia, to better understand the company's foreign competitors and to help tap Asian markets.<sup>46</sup>

Even firms who are not focused on exporting are finding that the demographics of their workforces are changing (see ch. 3). As the number of immigrants grows, language barriers will affect on-the-

job training. More companies will need trainers and supervisors who are adept in multicultural and multilingual environments.

### *Evaluation of Training*

Evaluation can improve training. Although it is rare, managers are becoming more interested in evaluation when they look more closely at their training expenditures and ponder what they got for their money.

A 1986 survey of training professionals in major corporations found that less than half of the training programs offered by their firms were evaluated at all.<sup>47</sup> Similar results were obtained in 1988, when ASTD surveyed several large companies known to keep excellent records of training costs. Of this small group, only 10 percent actually assessed the impacts of training on job performance, and only 25 percent looked at business results. In most of the firms, evaluation of training was limited to participant reactions and, to a lesser extent, knowledge gains.<sup>48</sup>

The ideal evaluation method for training measures:

1. reactions (how participants felt about the course);
2. knowledge/skill (through competency tests);
3. application (impact on job performance, judged by interviews with supervisors and peers following training); and
4. business results (such as increased sales or profits following training).<sup>49</sup>

The difficulty of applying this four-part model is illustrated by the experience of New England Telephone (NET). A rigorous evaluation of a technician training program took a full year to complete. With normal job turnover, the managers who had originally requested the study were gone by the time the favorable evaluation report arrived.<sup>50</sup> Today, NET relies primarily on reaction sheets and on focus groups held several months after training to

<sup>45</sup>"Donald E. Petersen: Chairman of Ford and Champion of Its People," *Training & Development Journal*, August 1988.

<sup>46</sup>Chmura, et al., op. cit., footnote 40, p. 9.

<sup>47</sup>T. Meigs-Burkhart, *Employee Training in America: A Comparative Assessment of Training and Development* (Princeton, NJ: Opinion Research Corp., 1986).

<sup>48</sup>Carnevale and Schulz, op. cit., footnote 43, p. 142.

<sup>49</sup>Donald Kirkpatrick, "Evaluation of Training," in R.L. Craig and L.R. Bittell (eds.), *Training and Development Handbook* (New York, NY: McGraw-Hill, Inc., 1976).

<sup>50</sup>As cited in Carnevale and Schulz, op. cit., footnote 43, p. 117.

Table 5-2—The Skill-Training Life Cycle

Changes in jobs, skills, and training	Phase of technology development			
	Phase I: Introduction	Phase II: Growth	Phase III: Maturity	Phase IV: Decline
Tasks .....	Complex	Increasingly routinized	Increasingly routinized	Narrowly defined
Job Skills .....	Firm-specific	Increasingly general	General; transferable	General; transferable
Skill training provider...	Employer or equipment manufacturer	Market-sensitive schools and colleges	Schools and colleges more generally	Declining number of schools and colleges; some skills provided by employer
Impact on jobs .....	Job enlargement; new positions created with significant change in skills needs	Emergence of new occupations	Relatively rigid job hier- archy; occupations as- sociated with formal ed- ucation and related work experience requirements	Elimination of occupa- tions

SOURCE: Patricia M. Flynn, adapted from *Facilitating Technological Change: The Human Resource Challenge*, T.J. Kozik and D.G. Jansson (eds.), *The Worker in Transition: Technological Change* (New York, NY: Ballinger Publishing Co., 1988), p. 19.

attempt to improve the quality of training and to increase its relevance to strategic business goals.<sup>51</sup>

Obviously, many other factors besides training can affect business results. Nevertheless, it is often possible to evaluate training in terms of bottom-line improvements. For example, customer-relations training should bring a reduction in lost customers and an increase in the accuracy of orders, both factors quantifiable in dollars.<sup>52</sup> When IBM trained all 1,500 employees at its Austin, Texas manufacturing plant to make better use of its continuous-flow manufacturing process, cycle time was reduced by over half, reducing inventory costs and avoiding the necessity of adding an expensive third shift.<sup>53</sup>

The potential payoffs of evaluation are great. Such analyses are necessary not only to justify growing corporate investments in training but also to weigh alternative delivery mechanisms and to improve the quality of training.

## TRAINING PROVIDERS

When adults were surveyed in 1983 about job-related training, the most striking finding was how few workers received training. About 55 percent said they had needed training to acquire their current jobs, but only 35 percent reported receiving any subsequent formal or informal skill improvement

training. Many adults reported receiving training from more than one source. Among those who said they had needed training to acquire their current jobs, almost 29 percent identified secondary or post-secondary schools, 28 percent said they were qualified through informal on-the-job training, and 10 percent obtained their jobs with skills learned in formal company training programs.<sup>54</sup>

Those who had received skill improvement training in addition to their basic qualifying training also frequently reported more than one source of this training. About 14 percent cited informal on-the-job training and 11 percent mentioned formal company training, while 12 percent said their skills were improved through secondary and post-secondary schools.

Many of those who used schools for job training were financially supported by their employers. Among those who reported that schools qualified them for their current jobs, 8 percent were sponsored by their employers, as were a full 41 percent of those receiving skill upgrading in schools.

Who provides training and where it is done may move through a "skill training life cycle" as new technologies are introduced, develop, and mature.<sup>55</sup> As shown in table 5-2, the introduction of newly developed technology into a workplace can create

<sup>51</sup>Ibid., p. 171.

<sup>52</sup>Dana Gaines Robinson and Jim Robinson, "Training for Impact," *Training and Development Journal*, vol. 43, No. 8, August 1989, p. 37.

<sup>53</sup>Grubb, op. cit., footnote 30, p. 25.

<sup>54</sup>Max L. Carey, *How Workers Get Their Training*, U.S. Department of Labor, Bureau of Labor Statistics, Bulletin No. 2226, March 1985, pp. 5-7.

<sup>55</sup>Patricia M. Flynn, *Facilitating Technological Change* (New York, NY: Ballinger, 1988), pp. 16, 27.

complex new tasks.<sup>56</sup> With the uncertain quantity and quality of skills required and the lack of a supply of appropriately trained workers, managers typically tack these tasks onto existing jobs. Because the skills needed are firm-specific, training is usually delivered either in-house or by the equipment vendor. Later, as the technology matures, tasks related to it become more standardized, new occupations related to it may emerge, and the supply of appropriately trained workers expands. Training for these new jobs, created by the adoption of relatively mature technologies, is more general (i.e., transferable among firms) and is more often provided outside the firms in schools and colleges.

According to one estimate, employers provide 69 percent of their formal training themselves and purchase 31 percent from outside providers.<sup>57</sup> (See box 5-A for a breakdown on the Federal Government's training expenditures on its own employees.) This reliance on in-house training may be explained in part by the skill-training life cycle, which suggests that firms rely on in-house sources during periods of rapid technological change.

A 1985 survey of supplier firms to the Michigan automobile industry found such a pattern. Among firms that had adopted use of statistical process control (SPC), computer numerically controlled (CNC) and computer-aided design (CAD) technologies, most training was delivered informally on the job. The firms typically sent technicians or line managers to a formal training class; these individuals then trained the others informally.<sup>58</sup>

The quality of in-house training is directly affected by the skill of training personnel, many of whom lack professional training education. As the number of full-time trainers grows, many trade and professional associations have sprung up to assist



Photo credit: American Petroleum Institute

Employers provide most of their formal training in-house.

them, including the American Society for Training and Development (ASTD), the National Society for Performance and Instruction, the Society for Applied Learning Technology, and the American Management Association.<sup>59</sup> A recent industry directory lists 61 membership organizations serving the training profession.<sup>60</sup> These associations help advance the skills and knowledge of professional trainers through publications, conferences, informal networking, and, in some cases, training courses.<sup>61</sup>

When they turn to outside resources, U.S. firms purchase training from a wide variety of providers including equipment vendors, private training consultants, and public and private schools and colleges. These purchases are estimated to total about \$9 billion per year.<sup>62</sup>

The relationship between in-house and outside training is complex. In-house trainers may assist in the design of a purchased course and maybe trained to teach it. On the other hand, some in-house training departments, such as AT&T's, have become so

<sup>56</sup>Patricia M. Flynn, "Introducing New Technology into the Workplace," in *Investing in People: A Strategy to Address America's Workforce Crisis*, Background Papers, V. 1 (Washington, D.C.: U.S. Department of Labor, Commission on Workforce Quality and Labor Market Efficiency, September 1989), pp. 421-426.

<sup>57</sup>Anthony P. Carnevale et al., *Training Partnerships: Linking Employers & Providers* (Washington, DC: American Society for Training & Development 1990), p. 1.

<sup>58</sup>James Jacobs, "The Training Needs of Michigan Automobile Suppliers" (Ann Arbor MI: Industrial Technology Institute, 1986), P. 7.

<sup>59</sup>Lee Gainer, ASTD, personal communication+ July 27, 1989.

<sup>60</sup>Lakewood Publications, *Training 1988-1989 Marketplace Directory*, p. 306.

<sup>61</sup>For example, the Miami Florida Chapter of ASTD, working with Florida International University, developed a two-semester part-time program leading to certification as a professional trainer. The curriculum included courses in instructional design and evaluation training—Betsy Caster and Willabeth Jordan, "Professional Trainers Go to School," *Training and Development Journal*, vol. 43, No. 7, July 1989, p. 78.

<sup>62</sup>*Training* magazine's 1989 industry survey estimates that \$9.37 billion was spent on purchased training that year—*Training*, Op. Cit., footnote 5, p. 40. Carnevale estimates that 31 percent of total employer investments of \$30 billion, or \$9 billion per year is spent on purchased training—Carnevale et al., (1989) op. cit., footnote 3, p. 1.

### Box 5-A—The Federal Government as Trainer

Federal agencies spent \$1.03 billion on training of their 2.1 million civilian employees in fiscal year 1988.<sup>1</sup> This amounted to nearly 1.7 percent of the government's payroll (salary, wages, and lump-sum payments, but not benefits) in 1988.<sup>2</sup> (By contrast, some training intensive companies may spend 2.5 percent of payroll or more on training.)

Almost 60 percent of the training dollars was used for internal training by agencies. The other 40 percent was used to cover the costs of training provided by public colleges and universities, trade and professional associations, and private training institutions.<sup>3</sup> Managerial, executive, and supervisory employees accounted for approximately 15 percent of total training hours and expenditures; nonsupervisory employees accounted for the remaining 85 percent.<sup>4</sup>

While statistics on training are collected by the Office of Personnel Management, qualitative assessments are more difficult to find. In the years between 1978 and 1988 the number of employees receiving training almost doubled, and the hours spent on training increased by 90 percent. The cost per hour of training increased by 20 percent, while the average length of training received by Federal employees decreased by a quarter.<sup>5</sup> It does not appear to be known how much of this to attribute to use of more effective training methods and technologies and how much to attribute to agency efforts to compensate for rising costs by shortening training sessions.

In the years between fiscal years 1985 and 1987, time devoted to the design and conduct of training by Federal employees increased 4.5 percent. The mix of personnel involved in training activities shifted to involve more instructors, and fewer support and administrative staff.

The U.S. military budgeted over \$18 billion for training in fiscal year 1990. This includes pay and allowances to trainees and trainers. As discussed in chapter 7 and in the appendix, the military has been a major source of research and development funds for learning research and for development of instructional technology. In fiscal year 1990, it spent \$22 million on basic research and exploratory development for education and training, and another \$73 million on subsequent or further development. It also spent \$81 million for research and development of simulators and training devices.<sup>6</sup>

<sup>1</sup>This includes nonuniformed employees of the Department of Defense. It does not include postal employees.

<sup>2</sup>Information provided by Geraldine Hahn, Office of Personnel Management, July 1990.

<sup>3</sup>United States Office of Personnel Management, office of Employee and Executive Development, *Employee Training in the Federal Service, Fiscal Year 1988*, p. 5.

<sup>4</sup>*Ibid.*, p. 7.

<sup>5</sup>*Ibid.*, p. 10.

<sup>6</sup>E.A. Alluisi, L. Richards-Means, and E.B. ViCino, *Training and Personnel Systems: R&D Program Description, Fiscal Year 1989/90* (San Diego, CA: Defense Technical Information Center, MATRIS Office, 1989).

successful that they are profit centers, selling training to other companies: In a few cases, these training divisions have been spun off into independent corporations, increasing the ranks of private training consulting firms. For example, Learning International, now an independent training vendor, formerly sold training as a division of Xerox (Xerox Learning Systems). The American Supplier Institute, which provides training to auto industry supplier firms, used to be a division of Ford.

### Equipment Vendors

Like most training, that provided by equipment vendors is of mixed quality. Equipment vendors sell hardware and software, not training. It is not

necessarily in their economic interest to provide training applicable to a competitors' products. But, because most companies install equipment from more than one vendor, their workers would benefit from broader training. When vendors provide initial training as part of a sales package, they design their courses to highlight their product's strengths rather than its problems. When downtime rises because workers lack maintenance skills, it can cut into the gains in productivity that would otherwise result from the purchase of new equipment.

Typically, vendors provide training on a short-term basis. Sometimes, companies develop longer term training relations with their vendors. Even these can be unpredictable. For example, one small

southern manufacturer of paper and plastic cups sent small groups of workers to its equipment vendor for intermittent training in machinery repair for many years. However, in 1989, the equipment manufacturer expressed reluctance to continue such training, and the manufacturer had difficulty in obtaining appropriate training from other outside sources.<sup>63</sup> Finally, the firm was forced to establish its own training center, near the equipment vendor's facility in Wisconsin. The manufacturer estimates that it costs about \$1,000 per week, including wages and travel costs, to send an employee to the new training center.<sup>64</sup>

Despite these limitations, vendors are often the initial and sometimes the only source of formal training workers receive when using new technology. Some equipment vendors are in fact major training providers. For example, Allen-Bradley, a major manufacturer of programmable controllers, has trained over 4,000 maintenance workers in a year. The enrollment compares to a large community college or vocational school.<sup>65</sup>

In the "skill-training life cycle" (table 5-2), vendor-delivered training is especially important when employers purchase new, innovative technology, because only the vendor knows how to use it. For example, during the 1950s, some firms adopting electronic data processing sent their employees to the computer manufacturers' schools for as long as 8 weeks to develop the needed skills.<sup>66</sup> Today, with training in data processing available from a wide range of public and private schools and colleges, vendor training may last only a few days. An OTA study of office automation found that, when new equipment was purchased, vendor training was limited to a brief orientation; the users were then left

on their own to experiment and learn what applications of the new computer system would best help them with their work.<sup>67</sup>

If vendors do not train everyone, they often instruct the client's key workers to train coworkers; unfortunately, the client firm often fails to give these key workers adequate time away from their ordinary responsibilities to train others. Worse, these lead workers may not be skilled trainers and may not reach all who will operate the equipment. A 1987 survey of large manufacturers and utilities found that vendors typically trained only the engineers, who were often poor teachers; they tended to assume a level of operator knowledge that was unrealistic. As a result, operators did not fully understand the new equipment and were not able to cope with system breakdowns.<sup>68</sup> Similarly, vendors of CNC equipment often train managers in small firms, rather than line workers who use the technology on a daily basis.<sup>69</sup>

A few equipment vendors are providing more generic in-depth training. For example, Allen-Bradley formed a joint venture with Control Data Corp. in the early 1980's to develop computer-based courses on programmable logic controllers, variable-frequency drives, and CNC fundamentals. These three courses, now marketed separately by the two firms, are applicable not just to Allen-Bradley equipment but also to other brands of controllers.<sup>70</sup>

New instructional Technology can be used to replace short, vendor-provided courses with ongoing instruction. For example, Control Data has developed a generic simulator of a programmable controller, which is produced and marketed by Amatrol, Inc., a vendor of fluid power systems.

<sup>63</sup>U.S. Congress, Office of Technology Assessment, *Making Things Better: Competing in Manufacturing*, OTA-ITE-443 (Washington, DC: U.S. Government Printing Office, February 1990), p. 182.

<sup>64</sup>Virgil Sperry, Imperial Cup, personal communication, July, 1990.

<sup>65</sup>Larren Elliott, former Allen-Bradley training official, personal communication, July 20, 1989.

<sup>66</sup>Patricia M. Flynn, "Technology Life Cycles and Career Paths," in T. J. Kozik and D. G. Jansson (eds.), *The Worker in Transition: Technological Change* (New York, NY: American Society of Mechanical Engineers, 1989), p. 250.

<sup>67</sup>U.S. Congress, Office of Technology Assessment, *Automation of America's Offices*, OTA-CIT-287 (Washington, DC: U.S. Government Printing Office, December 1985).

<sup>68</sup>R. B. Helfgott, *Computerized Manufacturing and Human Resources* (Lexington, MA: Heath, 1988), p. 39.

<sup>69</sup>Maryellen R. Kelley and Harvey Brooks, "The State of Computerized Automation in U.S. Manufacturing" (Cambridge, MA: John F. Kennedy School of Government, Harvard University, 1988), p. V-21.

<sup>70</sup>Rosow and Zager, op. cit., footnote 10, p. 100.

Maintenance workers can use the simulator to practice troubleshooting; they are timed in how long it takes to repair each of the 47 simulated failures in the system.<sup>71</sup>

Amatrol's participation in this joint venture is based on its experience in training for its own equipment. The company trainers learned first that customers wanted more generic training because their manufacturing systems were typically made up of components from a variety of vendors and *second that* customers want to deliver more training in-house but lack the equipment to do so. To fill this market niche, Amatrol began manufacturing computerized training work stations.<sup>72</sup>

### *Private Training Consultants*

Private training firms have experienced high rates of growth in recent years. Annual sales of outside services and off-the-shelf training programs and materials grew from \$1.5 billion in 1984 to \$3 billion in 1989.<sup>73</sup> Many entrepreneurs are attracted to this low-overhead business with its potentially high earnings.<sup>74</sup> One recent industry directory lists 500 training companies and consultants.<sup>75</sup> Another industry source estimates that there are at least 3,500 companies supplying training programs and seminars.<sup>76</sup>

As with other training sources, for-profit firms vary widely in quality. In theory, because of market incentives, private training firms can rapidly spread training techniques across the United States. They often respond to emerging training needs faster than public educational institutions.<sup>77</sup> For example, the number of private companies selling basic skills courses, both in print and through computers, is proliferating (see ch. 6).

The best consultants tailor training to meet the needs of individual employers. However, many others sell or rent off-the-shelf packages that may or may not apply to the employer's business goals and workforce. A few offer training techniques whose effectiveness is unproven. For example, several firms sell motivational tapes that purport to reach a deeper level of consciousness by sending messages separately to the two hemispheres of the brain. Studies by behavioral psychologists indicate that this technique fails to enhance learning.<sup>78</sup> Independent evaluations, with experimental and control groups would be needed to substantiate the claims made about some training products. Such evaluations are seldom conducted.<sup>79</sup>

Even as more small firms enter the private training industry, larger, established firms are undergoing a wave of mergers and acquisitions. For example, Zenger-Miller, one of the largest supervisory and management training firms, was acquired in 1989 by Times Mirror Co., the Los Angeles-based newspaper publisher.<sup>80</sup> Times Mirror had earlier acquired Xerox Learning Systems, specializing in sales training, and Mirror Systems, Inc., an interactive video disc training firm. Since that time, Times Mirror has purchased Kaset, Inc., a company specializing in customer service training.<sup>81</sup> With corporate training directors looking for courses to meet a variety of strategic goals, including higher quality, better service, and improved productivity, such mergers could offer clients a one-stop shop.

Increased centralization of the private training industry could improve the efficiency of worker training. The Instructional Systems Association, a trade group representing the industry, reports that the most positive results of the merger and acquisition trend are additional funds, which could be used

<sup>71</sup>Lauren Elliott, personal communication, July 20, 1989.

<sup>72</sup>Paul Perkins, Vice President for Marketing, Amatrol, Inc., personal communication, July 25, 1989.

<sup>73</sup>As cited in *Training Magazine*, October 1984 and October 1989.

<sup>74</sup>Carnevale et al. (1989), op. cit., footnote 3, P. 158.

<sup>75</sup>*ASTD Buyer's Guide & Consultant Directory*, (Alexandria, VA: ASTD, 1989), P. 3.

<sup>76</sup>Vincent W. Hope et al., "Packages and Seminars," in Robert L. Craig (ed.) *Training and Development Handbook*, 3d edition (New York, NY: McGraw Hill, 1987), p. 828.

<sup>77</sup>Patricia Flynn Pannell, "Occupational Education and Training: Goals and Performance," in Peter B. Doeringer and Bruce Vermeulen (eds.), *Jobs and Training in the 1980's* (Boston, MA: Martinus Nijhoff Publishing, 1981), p. 64.

<sup>78</sup>National Research Council, *Enhancing Human Potential* (Washington, D.C.: National Academy Press, 1988), p. 21.

<sup>79</sup>*Ibid.*, p. 17.

<sup>80</sup>"Zenger-Miller bought by Times Mirror: Consolidation A Trend," *Training*, vol. 26, No. 1, January 1989, p. 14.

<sup>81</sup>Terry Broomfield, Executive Director, Instructional Systems Association, personal communication, July 26, 1989.

for research and development, improved delivery systems, and improved quality.<sup>82</sup> However, it is also possible that mergers and acquisition will lead to greater emphasis on off-the-shelf packages and standardized approaches that fail to meet employers' unique needs.

### *Proprietary Schools*

Privately owned and operated vocational schools traditionally fill an important niche in pre-employment training for young people. These proprietary trade and technical schools serve a population largely unreached by other educational institutions—low-income, young adult minorities—and have a lower dropout rate than their publicly funded counterparts.<sup>83</sup> On average, proprietary schools place 81 percent of their graduates, which suggests to some that their graduates' skills match labor market needs.<sup>84</sup> However, graduates of proprietary schools are more likely to wind up unemployed than are graduates of public post-secondary institutions.<sup>85</sup> Perhaps the narrow training proprietary school students get is useful for entry-level jobs but does not provide a good basis for further advancement. Small firms are more likely than larger firms to rely on these schools as a source of skilled workers.<sup>86</sup>

Many proprietary schools have excellent records. For example, over 95 percent of graduates of one Washington, DC school are placed as electronics technicians with large computer manufacturers.<sup>87</sup>

In contrast, reports of fraud and abuse of Federal financial aid<sup>88</sup> by other schools have hurt the reputation of the whole system.

For example, a computer school in New York City arranged for \$25 million in guaranteed student loans for its enrollees between 1984 and 1987. Students testified that teachers frequently slept in class or did not show up at all. The school closed in September 1987, leaving its students without any appreciable skills but saddled with student loans averaging \$2,500 each.<sup>89</sup> The U.S. Department of Education launched a new initiative in June 1989 to try to control loan defaults at proprietary schools.

Now that enrollment of young adults from the "baby boom" has ended, proprietary schools are beginning to offer employers their services as a source of upgrade training. For example, in 1985, National Education Corp. (NEC) operated 43 proprietary schools in 10 States and obtained about 65 percent of its revenues from federally guaranteed loans and grants.<sup>90</sup> By 1988, although the chain had grown to 53 schools, enrollment growth was modest, and NEC refocused its marketing toward employers. Through an agreement with United Auto Workers (UAW) and Ford, NEC launched technical literacy courses for over 1,000 Ford workers at 17 auto plants that year.<sup>91</sup>

The experience of some GM workers with proprietary schools turned out poorly: Shortly after the UAW negotiated generous tuition assistance payments with GM in 1985, a Lansing, Michigan computer training firm attracted UAW members to its classes by offering free computer components, but it provided little training. The Michigan Department of Education found that the firm employed "a janitor without experience or degree in the field, a

<sup>82</sup>Terry Broomfield, "ISA Survey on Mergers and Acquisitions" (Sunset Beach, CA: Instructional Systems Association, July 1989).

<sup>83</sup>Women comprise approximately 10 percent more of the student enrollment than at public postsecondary institutions, blacks comprise 13 percent more, and Latinos approximately 7 percent more. Over half of proprietary school students have household incomes of less than \$23,000 per year—is 20 to 40 percent more than the proportion of students with household incomes of less than \$23,000 per year in public institutions), and are under 23 years old—U.S. Department of Education, *National Assessment of Vocational Education, Final Report, Vol. I* (Washington DC, 1989), p. 103. See pp. 104-106 for data on retention rates.

<sup>84</sup>JBL Associates, *Facts About Private Career Schools, Their Students, and the Postsecondary Education Context* (Bethesda MD: The Career Training Foundation, 1989), p. 3.

<sup>85</sup>U.S. Department of Education, op.cit., footnote 6, p. 109.

<sup>86</sup>U.S. Small Business Administration, Office of Advocacy, *Small Business in the American Economy* (Washington, DC: U.S. Government Printing Office, 1988), p. %.

<sup>87</sup>Nell Eurich (ed.), *Learning to Work: Resources for Adult Training* (forthcoming from the Carnegie Foundation for the Advancement of Teaching, 1990), p. 204.

<sup>88</sup>About 70 percent of all students enrolled in proprietary schools receive federally guaranteed loans—JBL Associates, "Facts About Private Career Schools, Their Students and the Postsecondary Education Context" (Bethesda, MD: JBL Associates, 1989), p. 3.

<sup>89</sup>Gary Putka, "Shady Trade Schools Imperil Federal System of Loans to Students," *Wall Street Journal*, vol. CCXIII, No. 60, Mar. 28, 1989, pp. A1, A12.

<sup>90</sup>Oppenheimer & Company, "New Recommendation: National Education" (New York, NY, 1985), p. 4.

<sup>91</sup>"National Education Corporation 1988 Annual Report" (Irvine, CA: National Education Corp., 1989), p. 3.



plumber, a waitress, a construction worker, a real estate salesperson, advertiser, minister, and dietician who apparently have no qualifications for the areas they are teaching.”<sup>92</sup> The firm collected over \$1 million intuition payments from the UAW-GM joint training fund before the UAW-GM Human Resource Center stepped into suspend payments.<sup>93</sup>

As proprietary schools become more involved in efforts to upgrade the skills of employees, employers will need to select carefully. Trade and technical schools with good reputations and track records clearly can offer useful training. Moreover, the better trade and technical schools respond quickly to changes in the labor market and technologies.

## SHARED TRAINING

One way firms can find their way through the maze of training providers is by pooling their resources to jointly buy or develop training. Sharing the high costs of developing new courses could potentially make training financially feasible for many more firms, particularly small firms. However, until recently, such efforts have been quite limited in the United States. One factor in firms’ general reluctance to pool their training efforts is the perceived threat of violating anti-trust laws.<sup>94</sup> As discussed in chapter 2, legislation now under consideration might alleviate this problem.

Despite the limitations, there are several avenues through which two or more firms can share training. They include:

- unions and professional associations;
- trade associations; and
- educational institutions.

In addition, as interest in training grows, firms may begin to form consortia specifically for training purposes.

### *Unions and Professional Associations*

High quality training is expensive. To support the costs of such training within a company or an industry, the firm or industry must, in effect, tax

itself. In unionized companies, collective bargaining provides a mechanism for collecting such fees. Because industrial unions typically seek uniform wages and benefits across an industry, they can be the catalyst for the formation of industry associations. This is most obvious in the United States in the construction industry, where local and national trade associations formed to bargain with strong unions. A key activity of these trade associations is development and implementation of apprenticeship training with the unions (see ch. 8).

Without unions, financing shared training can be more difficult. Industry associations may be unable to obtain voluntary contributions from member firms, and a single firm acting alone may be unwilling or unable to support such extensive training.<sup>95</sup> However, professional associations sometimes play a role similar to that of unions. For example, the Institute for Auto Service Excellence (ASE) operates a voluntary certification program for automotive technicians. Although ASE does not dictate what type or where the technicians receive their training, they must pass uniform tests to win certification. Another example is the National Council for Early Childhood Education, which has developed a competency-based curriculum for child-care providers. This curriculum includes modules that can be included or excluded, depending on the knowledge required to meet varying State licensing exams.

### *Trade Associations*

Trade associations and industry groups in the United States are less involved in training than those in Europe.<sup>96</sup> In response to a 1987 survey, State and national trade association executives said that current training activities cost the associations more in terms of money and time than they made from the fees charged for training delivered. National trade associations were not as concerned as State and local associations, presumably because they had a larger funding base. A closely related problem is the incompatibility between training activities and trade associations’ mission statements. In cases where the

<sup>92</sup>Stephen Franklin, “GM, Union Learn a Lesson on Retraining,” *Chicago Tribune, Sunday, Jan. 25, 1987*, pp. B-1, B-13.

<sup>93</sup>*Ibid.*, p. B-1.

<sup>94</sup>Lauri J. Bassi, “Multi-Employer Training Consortia: An Idea Whose Time Has Come” (Washington DC: NFIB Foundation 1990), p. 7.

<sup>95</sup>Robert W. Glover, “Expanding the Use of Apprenticeship,” report submitted to the Bureau of Apprenticeship and Training, U.S. Department Of Labor, September 1988, p. 26.

<sup>96</sup>Bassi, *op. cit.*, footnote 94, p. 6.

association did not have a specific mandate to deliver training, funding was available only through other programs, and a fair amount of work had to be done voluntarily by staff members with other job descriptions.<sup>97</sup>

These attitudes may help explain why a Federal effort to promote apprenticeship training through national trade associations in the late 1970's had little long-term impact. Once the Federal funds were gone, none of the national associations continued training programs on their own initiative. A few programs in unionized industries, such as fire fighters and health care workers, continue at the local level (see ch. 8). However, the fragmentation of industries such as auto repair made it impossible to develop a uniform curriculum and train a substantial number of apprentices.<sup>98</sup> There are notable exceptions to U.S. trade associations' generally poor track record in training. The National Tooling and Machining Association (NTMA) was founded in 1943 expressly to train machinists to replace those going to war. Today, the association has three training products: 1) curriculum modules, which they sell to firms; 2) a 4-year machinery training apprenticeship, or MTA; and 3) a 12-week, 40-hours-per-week, pre-employment screening and training program usually offered in conjunction with community colleges. The Chicago affiliate of NTMA operates a successful apprenticeship program that has now trained 50 journeymen. Although the effort received a small seed grant from the State Of Illinois, it is supported primarily by *metier* companies.<sup>99</sup> Another example is the American Institute of Banking (AIB), an arm of the American Banking Association. AIB currently trains about 300,000 workers per year and offers 3 levels of accreditation in banking skills.

The success of joint union-trade association training programs in construction has led a growing number of nonunion construction firms to pool their resources for training. For example, the Associated Builders and Contractors (ABC) operates apprenticeship programs for member firms. However, these

programs are less formal and have higher attrition rates than those in unionized firms.<sup>100</sup> In 1989, ABC joined forces with three other construction industry trade associations, representing both union and nonunion construction firms, specifically to address expected shortages of skilled craft workers. Their new, nonprofit, Construction Industry Workforce Foundation, offers promise of developing shared training approaches throughout the industry.<sup>101</sup> The Business Roundtable, a national industry association located in New York City, launched a major effort to promote nonunion construction apprenticeship in 1989. This effort focuses on the creation of local Users Councils (LUCs), or groups of local contractors, who would work together to influence the training curricula of local vocational schools to match their training requirements. The LUC in Baton Rouge, Louisiana appears to have had some success in developing the type of training they require.

### *Educational Institutions*

**Local** educational institutions are a natural vehicle through which individual firms may pool their training resources. As discussed in the following section, more and more community colleges are providing training customized to meet the needs of an individual employer. In some cases, such efforts spin off improved curricula that can help meet the needs of a larger group of employers. For example, some educational institutions work with trade associations to develop generic training for an industry. In the survey cited above, the few trade association executives that reported that they delivered training to their members noted the cooperation of vocational education personnel as a key element of their success.<sup>102</sup> The availability of State funds to back cooperative training was also cited as a key element of a successful trade association training program.

customized training for individual firms can, over time, lead to more formalized structures, in which firms support the colleges' training and other programs on an ongoing basis. For example, the

<sup>97</sup>Wayne E. Schroeder and Roy L. Butler, *Improving Vocational Education Programming through Greater Involvement of Trade Associations* (Columbus, OH: National Center for Research in Vocational Education, 1987), p. 29.

<sup>98</sup>Glover, 1988, op. cit., footnote 95, p. 28.

<sup>99</sup>Don E. Frey, Northwestern University, personal communication, May 25, 1990.

<sup>100</sup>Bassi, op. cit., footnote 94, p. 5.

<sup>101</sup>Judy Schriener, "Ganging upon work force problems," *Engineering News-Record*, vol. 224, no. 2 (January 11, 1990), p. 39.

<sup>102</sup>Schroeder and Butler, op. cit., footnote 97, p. 28.

Unified Technology Center (UTC) at **Cuyahoga Community College** in Cleveland, Ohio was initiated by the community college president in the early 1980's.<sup>103</sup> The new program was aimed at helping industry with technology adoption and training. Although it was initially funded through the State and the community college, it currently receives half of its support from the private sector, one quarter from the community college, and another quarter from State and Federal funds (Federal funds come from designation as a National Institute of Standards and Technology technology transfer center). UTC now sells both training and technology consulting services, particularly to small and medium-sized firms.

The Southern Technology Council's (STC) Consortium for Manufacturing Competitiveness (CMC) has a similar mission on a regional scale. An offshoot of the Southern Growth Policies Board, STC includes representatives of Southern Governors, legislatures, and industry. CMC was formed with Federal as well as State support in 1988 with three goals:

1. to demonstrate that public vocational schools and community colleges can help small and medium-sized manufacturers with new technology;
2. to provide more information about the training needed for the factories of the future; and
3. to produce graduates who are able not only to adapt to technological change but to facilitate it.<sup>104</sup>

The 14 State-supported educational institutions that make up the CMC have expanded their services to employers and have leveraged private funding with consortium monies. For example, Southern Arkansas University Technical School has received business support to upgrade its CAD and computer-aided manufacturing (CAM) training and to serve as a demonstration facility for firms who want to pilot new processes there. The school has also equipped three mobile training facilities: tabletop robotics laboratory, a CAD/CAM center, and a hydraulics and pneumatics laboratory-which travel to other

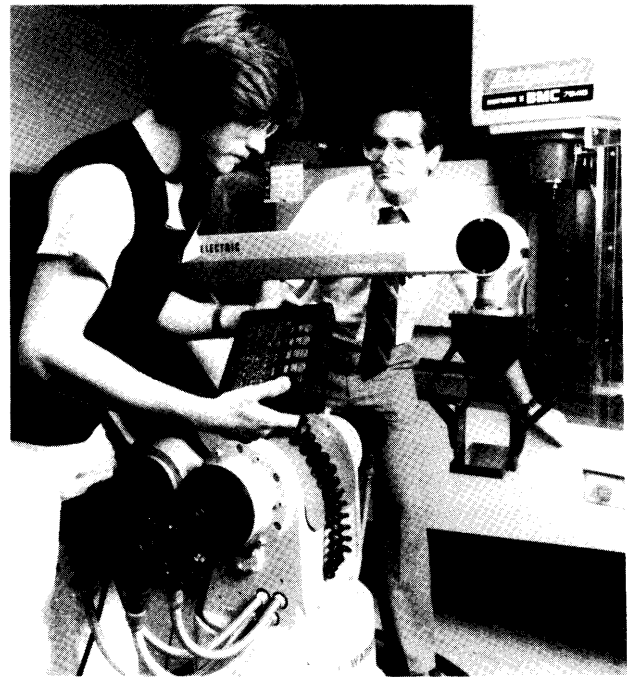


Photo credit: American Association for Community and Junior Colleges

Community colleges face the challenge of providing training broad enough to prepare individuals for a technically changing world, but specific enough to meet the immediate needs of employers.

colleges, vocational technical **institutes**, and manufacturing firms.<sup>105</sup> Thus, each member school in the consortium acts as a catalyst for its own local industries, providing a shared source of expertise on training and technology transfer. On a regional level, with support from the U.S. Department of Education, the Consortium is conducting an ongoing poll to assess the skill needs of small manufacturers who are in the process of automating.<sup>106</sup> This information may be used to revise school curricula throughout the region, to the benefit of many employers.

Like UTC, the CMC, since 1989, has received financial support from the National Institute of Standards and Technology. Funds come through the Southeastern Manufacturing Center at the University of South Carolina-one of three federally supported centers whose goal is to bring advanced

<sup>103</sup>Sandra Hodge, Cuyahoga Community College, personal communication Mar. 1, 1989.

<sup>104</sup>Southern Growth Policies Board, *Technical and Community Colleges: Leading the Way Into the Nineties* (Research Triangle Park, NC: Southern Growth Policies Board, 1989), p. 3.

<sup>105</sup>Ibid.

<sup>106</sup>Southern Growth Policies Board, *Turning to Technology: A Strategic Plan for the Nineties* (Research Triangle Park, NC: Southern Growth Policies Board, 1989), p. 26.

manufacturing technologies to small U.S. manufacturers. The Southeastern Manufacturing Center plans to use State community colleges to deliver these services throughout the region, and the CMC is seen as the link to these institutions.

## THE GROWING STATE ROLE

State governments have fostered cooperation between educational institutions and employers for many years. In 1957, North Carolina launched anew program of customized training that helped induce New England textile mills to move south.<sup>107</sup> In 1964, this program was formalized in the creation of a community college system with the dual function of training young people for jobs in the newly industrializing North Carolina economy while also providing the customized skills needed by employers moving into the State.<sup>108</sup> Soon afterward, South Carolina and Oklahoma created similar networks of schools.

Over the past two decades, the States have expanded their uses of training as an economic development tool. Today, training is used not only to woo new firms, but also to induce existing employers to create new jobs and to help existing employers that are not expanding to improve their business performance.

### Funding

**In 1989,44** States operated 1 or more customized training programs, according to an OTA survey.<sup>109</sup> The 51 training programs identified in the survey spent approximately \$375 million on customized training projects during their most recently completed fiscal year. Most of the programs served a variety of purposes, including industrial recruitment and aiding expansions of existing businesses. However, the States reported increasing demand for upgrade training of employed workers: Almost one-third of the State training programs spent more than 35 percent of their funds on in service training for

firms that were not adding new jobs to the State economy.<sup>110</sup>

The \$375 million that States spent on customized training programs is only a portion of their total expenditures on worker training. When recruiting large industrial firms, some States provide one-time training subsidies not counted in the figure above. The State of Illinois made a one-time expenditure of about \$64 million in hiring and training assistance when it recruited a Mitsubishi/Chrysler joint venture plant to Normal, Illinois in 1988.<sup>111</sup> Most of this special spending was not part of the State's three customized training programs, which together had annual budgets of \$36.3 million.

OTA also did not identify indirect forms of State support for vocational-technical institutes and community colleges that perform customized training on an ad hoc basis at employer request. Employers pay less for this training than they otherwise would because the State picks up some of the community colleges' costs for facilities and trainers.

The typical State customized training program is small. Half serve under 4,000 employees, and involve less than \$2,500,000 in State expenditures. (See table 5-3.) California has by far the largest program, accounting for one-fourth of the spending. Three others (Illinois, Iowa, and Michigan) account for another quarter.

The most common uses for the State training funds are vocational skills upgrading, teamwork training, quality control, and managerial or supervisory training. As discussed in chapter 6, some States also offer workplace basic skills instruction with industrial training assistance.

The State programs serve companies of all sizes; however, firms with 200 to 500 employees seem to get much of the funding. A majority of the programs spend most of their funds to assist manufacturing firms.

<sup>107</sup>David W. Stevens, "The Role of Vocational Education in Missouri's Economic Development What Can We Learn From Other States?" (Jefferson City, MO: Missouri State Council on Vocational Education, 1989), p. 1.

<sup>108</sup>Commission on the Future of the North Carolina Community College System, *Gaining the Competitive Edge: The Challenge to North Carolina's Community Colleges* (Chapel Hill, NC, 1989).

<sup>109</sup>The survey only included programs that: 1) spend at least 50 percent of their funds for customized training projects with particular businesses of groups of businesses and 2) receive at least 30 percent of their funds from State sources. See Peter Creticos, Steve Duscha, and Bob Sheets, "State-Financed, customized Training Programs: A Comparative State Survey," report prepared for the Office of Technology Assessment under contract L3-3810, Feb. 18, 1990, p. i.

<sup>110</sup>*Ibid.*, p. ii.

<sup>111</sup>State of Illinois, Office of the Auditor General, "Management and Program Audit of the Department of Commerce and Community Affairs Economic Development Programs," July 1989, p. 106 (table VII-7).

**Table 5-3-Selected Characteristics of State-Financed Customized Training Programs (most recent fiscal year)**

	Median	Low	High
Number of contracts with firms . . . . .	64	5	500
Average contract amount per program. . . . .	\$43,313	\$6,500	\$1,046,000
Range of total program expenditures among States. .	\$2,400,000	\$111,700	\$106,000,000 <sup>a</sup>
Number of employees trained in FY 1988-89 . . . . .	3,940	99	55,243
Expenditure per enrollee . . . . .	\$460	\$75	\$3,461

<sup>a</sup>Includes some carryover.

SOURCE: Peter A. Creticos and Robert G. Sheets, *State Financed, Customized Training Programs: A Comparative State Survey*, report prepared for the Office of Technology Assessment under contract #L330810, 1990, tables 4,6.

### *Effectiveness*

State-subsidized customized training programs have an uneven track record. This is not surprising—most of the programs were not designed solely to train employed workers. Instead, most States expect the programs to serve mixed, often conflicting, goals—attracting new industries, avoiding layoffs at existing plants, aiding in company expansion, enhancing workers' careers, and providing benefits to the larger society.

#### Employed Worker Training

However, a National Governors' Association study of four State programs—New York, Illinois, California, and Missouri—suggests the programs have helped retain jobs by enhancing the effectiveness of existing firms.<sup>112</sup> The four programs represent the newest type of State training programs; they provide training grants to companies with very few strings attached, allowing the company to decide on the content and the provider. The researchers studied 24 companies that received financial and, in some cases, technical assistance for training. Although the purpose of the case studies was not to evaluate the success of the State programs but rather to develop a methodology for future evaluation, the results provide preliminary evidence of positive outcomes.

All 24 firms showed improvements in business performance from the training.<sup>113</sup> These improvements were due not to training alone; the training was part of a broader effort to improve productivity, quality, and profitability. For example, Northwest-

ern Steel and Wire Co., in Sterling, Illinois, wanted to raise profits by bringing its costs down to meet those of other U.S. mini-mills. (An industry-sponsored study had shown that Northwestern's maintenance costs were much higher than the industry average). The company used a State grant to cross-train its maintenance workers; at the same time, Northwestern changed its product mix and took other steps to reduce maintenance costs. Taken together, all of these actions, including the training, succeeded in reducing maintenance costs.<sup>114</sup>

The 24 case studies also showed that the State funds allowed the firms to train more workers more quickly than was possible using only company funds and that top managers in all companies came to view training much more positively.<sup>115</sup>

#### Industrial Recruitment

Customized training has proven a valuable tool in attracting new industries. originally, Southern States used customized training delivered through their community colleges to attract northern firms, especially textile mills. As the pool of recruits has shrunk, both Northern and Southern States are recruiting foreign companies. For example, between 1986 and 1988, Michigan provided \$19 million to train 3,000 new workers as part of a package that attracted Japan's Mazda Corp. to suburban Detroit.<sup>116</sup>

The States usually provide tax abatements, new infrastructure, and other incentives as well as training to recruit new industry. However, as busi-

<sup>112</sup>Creticos and Sheets, op. cit., footnote 26, p. 83.

<sup>113</sup>Ibid., p. 83.

<sup>114</sup>Ibid., p. 211.

<sup>115</sup>Ibid., p. 85.

<sup>116</sup>Louise Kertesz, "Injury, Training Woes Hit New Mazda Plant," *Automotive News*, Feb. 13, 1989, p. 52.

ness interest in a high quality workforce grows, training is becoming a central part of the incentive package. When the German silicon wafer manufacturer, DNS, was searching for a U.S. site, the company chose North Carolina over Colorado and Texas because of North Carolina's excellent community college system and its "carte blanche offer of assistance."<sup>117</sup> This assistance, provided by Durham Technical Community College, included hiring new faculty, sending them to DNS' plant in Italy, developing new training materials, and screening and training new employees.<sup>118</sup>

Despite its short-term effectiveness, some State officials now doubt the value of customized training in industrial recruitment:<sup>119</sup>

... recruitment has been compared to the great buffalo hunts of the last century. The stampede is over; herds are no longer plentiful; and 1986 would be a bad year to go into the buffalo hide business.<sup>120</sup>

Questions about this economic development tool arise because many of the firms that initially relocated to benefit from a low-wage workforce trained to company specifications have now moved abroad in search of even lower wages.<sup>121</sup> Some research suggests that branch plants of nonlocal firms, which provide large numbers of new jobs in the short term, may offer less long-term benefit to local economies because of their tendency to relocate again, and because they provide relatively low-skilled jobs based on standardized production.<sup>122</sup>

Industrial recruitment was, and still is, considered an important tool for providing jobs in the South's rural counties, where wages are low and jobs are few. However, a detailed analysis of growth trends throughout the region demonstrates that, between 1977 and 1988, rural counties experienced high unemployment and declining real per capita income, despite attracting new factories. By contrast, Southern urban counties with better educated populations experienced strong job growth and lower unemployment.<sup>123</sup>

Other concerns have been raised about using training in industrial recruitment.<sup>124</sup> One is that short-term, company-specific training may not provide the broad skills workers need to survive in today's turbulent job markets. Also, existing businesses may suffer when their newly arrived competition is subsidized by the State.<sup>125</sup>

### *Community Colleges and Vocational-Technical Institutes*

Many (19) of the 51 State-customized job training programs in OTA's survey relied on community colleges or vocational-technical institutes.<sup>126</sup> These programs often serve existing as well as new firms.<sup>127</sup> In addition, many post-secondary institutions provide occasional customized training in response to the requests of individual employers. Estimates of the fraction of community colleges and vocational-technical institutes providing training customized to the needs of employers (whether through formal State programs or on an ad hoc basis) range from 63 to 75 percent.<sup>128</sup>

<sup>117</sup>Paul Delker, "Worker Training: A Study of Nine Companies," report prepared for the Office of Technology Assessment under contract H3-6785, September 1988, pp. 14-15.

<sup>118</sup>*Ibid.*, pp. 15-16.

<sup>119</sup>Southern Growth Policies Board, "Halfway Home and A Long Way To Go: The Report on the 1986 Commission on the Future Of the South" (Research Triangle Park, NC, 1988), p. 21.

<sup>120</sup>*Ibid.*

<sup>121</sup>*Ibid.*

<sup>122</sup>Patricia M. Flynn, "Vocational Education Policy and Economic Development: Balancing Short-Term and Long-Term Needs," *Design Papers for the National Assessment of Vocational Education* (Washington DC: U.S. Department of Education, National Assessment of Vocational Education, 1987), p. III-13.

<sup>123</sup>Stuart Rosenfeld and Edward Bergman, *Making Connection* (Research Triangle Park, NC: Southern Growth Policies Board, 1989), p. ix.

<sup>124</sup>"Taking Care of Business" *The Economist*, vol. 310, No. 7590, Feb. 18, 1989, p. 28.

<sup>125</sup>*Ibid.*

<sup>126</sup>Creticos, Dusha, and Sheets, op. cit., footnote 109, p. 19.

<sup>127</sup>Examples include North Carolina's "Focused Industrial Training" program and Massachusetts' Bay State Skills Corp.

<sup>128</sup>Janet Swartz, "State and Local Response to the Perkins &~" report prepared by Abt Associates for the National Assessment Of Vocational Education, January 1989; personal communication with Jim Palmer, Associate Director of the Center for Community College Education, George Mason University, Mar. 22, 1990.

There are numerous examples of community colleges providing customized training for business. When the Boulder, Colorado, IBM plant changed its mission from manufacturing to software development in 1986, Front Range Community College retrained almost 1,200 of the 2,000 employees for new positions at the plant.<sup>129</sup> IBM now contracts with Front Range instructors to teach a "programming fundamentals" course previously taught in-house.

In response to the increasing complexity of auto repairs, General Motors developed the GM Auto Services Education Program in 1980.<sup>130</sup> GM trains instructors, provides the curriculum, and donates between \$90,000 and \$100,000 worth of current equipment to each of 50 community colleges across the country. These community colleges in turn train between 600 and 800 GM technicians annually through a 2-year cooperative education program. GM also encourages the community colleges to design related courses for other local service stations and for GM technicians interested in maintaining and upgrading their skills. Other automobile manufacturers are developing similar programs.

Despite these successes, many employers perceive post-secondary schools to be ineffective and inefficient. A 1983 survey of 522 corporate trainers in the Southwest (which had a 72 percent response rate) found that allocations of training budgets reflected trainers' perceptions of the most effective sources of training. Not surprisingly, the trainers rated their own in-house training as the most effective source for both technical training and professional development, followed by private consultants. Trainers preferred delivering training through workshops, seminars, and custom courses as opposed to educational institutions' typical offerings of formal credit and noncredit courses.<sup>131</sup>

A 1987 survey of manufacturers in the South reached similar conclusions. Among the 104 firms responding to the survey, the vast majority (98

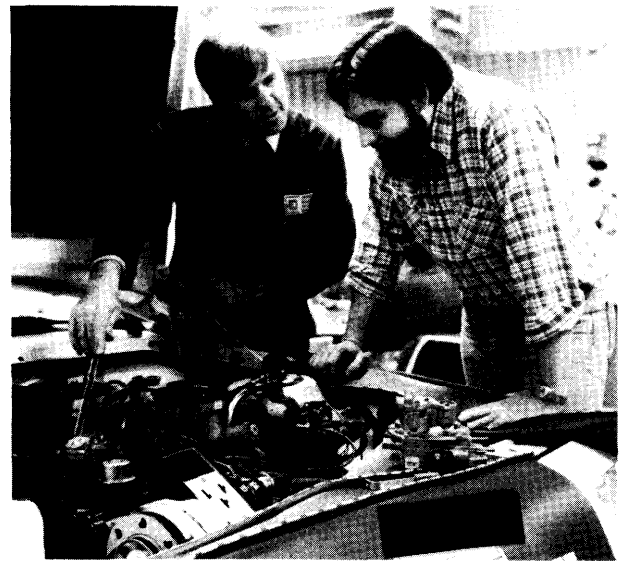


Photo credit: American Association for Community and Junior Colleges

Some U.S. automobile manufacturers have cooperative education programs with community colleges to train service technicians.

percent) relied on in-house training, while 84 percent also used training supplied by equipment vendors. Less than half (41 percent) reported using community colleges as training providers, and only 10 percent used universities.<sup>132</sup> The availability of community colleges was not considered important in the location decisions of these firms.<sup>133</sup>

State-funded post-secondary institutions are not in business only to serve individual employers with customized training. Both public and private vocational training institutions try to simultaneously serve three masters-the individual, the employer, and society.<sup>134</sup> In many States, community colleges evolved out of junior colleges designed to serve individuals by providing a broad education in preparation for transfer to a 4-year college. Since the 1950s, State-supported, 2-year, post-secondary institutions have increasingly emphasized full-time

<sup>129</sup>Information from the American Association of Community and Junior Colleges Partnership Awards, 1989.

<sup>130</sup>Information provided by General Motors.

<sup>131</sup>Katherine Moser and Don Seaman, "Implications for Potential Linkages Between Business-Industry and Higher Education," *Adult Education Quarterly*, vol. 37, No. 4, Summer 1987, pp. 225.

<sup>132</sup>Stuart A. Rosenfeld et. al., *Reviving the Rural Factory, V.I: The Final Report* (Research Triangle Park, NC: Southern Growth Policies Board, 1988), p. xii.

<sup>133</sup>*Ibid.*, p. 53.

<sup>134</sup>Patricia Flynn Pannell, op. cit., footnote 77, p. 50.

vocational courses for young people: this is now these schools' primary focus.<sup>135</sup>

Providing ongoing training to employed workers has only recently joined the many other goals of State-funded community colleges and vocational technical institutions, and State management of these institutions reflects this history.<sup>136</sup> Most States subsidize these institutions based on full-time equivalent (FTE) enrollments. Such funding formulas, originally developed for 4-year colleges whose students enroll full time, do not reward community colleges and vocational-technical institutes for providing the short courses employers want. For example, courses offered by Colorado community colleges must last at least 15 hours and use a standard, Statewide curriculum approved by a State board in order to qualify as "accredited" courses leading to FTE reimbursement.<sup>137</sup>

South Carolina is more lenient, reimbursing colleges for shorter, noncredit "continuing education" courses targeted to individual employers. However, here, too, student contact hours must be added up into FTEs, and courses must be approved by a State board.<sup>138</sup> These requirements are time-consuming, yielding relatively small rewards. The colleges can get more money more easily by either enrolling full-time students or tapping the State's program for new and expanding businesses.

Community colleges typically seek large employers that will fill up their classrooms, offering economies of scale. At the same time, the larger employers may have full-time training staff with the time and energy to seek out training assistance. Small firms are less likely to seek community college customized training services.

While some community colleges are beginning to target small businesses, the training offered is frequently designed for managers and entrepreneurs, rather than for nonsupervisory employees. Daytona Beach Community College, for example, runs the

Mid-Florida Research and Business Center, providing counseling and seminars on topics ranging from contracts research to trade and export.<sup>139</sup> While this assistance is undoubtedly welcomed by local small businesses, it cannot replace customized training for employees.

Community colleges in North Carolina use a process called "DACUM" (Developing a Curriculum), to match their vocational curricula for full-time students to the changing needs of local employers. This process involves convening a panel of 8 to 12 expert workers who work with a college coordinator to identify lists of competencies needed in a particular occupation.<sup>140</sup> The competencies are used by community college instructors to match the courses more closely to real-world jobs. Use of such techniques, which require ongoing communication between employers and schools, can help overcome negative perceptions and encourage more companies to use educational institutions to train their workers.

### *Training and Technology Extension*

*Small* employers often need better technology and improved management techniques as well as training assistance. However, current State technology transfer programs are limited in scope and poorly linked with State training assistance. About 10 States currently spend an estimated \$25 million to \$40 million on industrial extension services, which provide technical assistance to small manufacturers installing advanced technology.<sup>141</sup> Although these programs are often housed in State universities, their links to State training programs and 2-year institutions are typically weak. An exception is the Michigan Modernization Service (MMS) which provides training assistance and helps businesses obtain funds from State training programs.

On each site visit, MMS sends training and technology specialists to conduct the diagnosis and write the report, which includes an assessment of

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<sup>135</sup>U.S. Department of Education, *National Assessment of Vocational Education Final Report, vol. 1* (Washington, DC: National Assessment of Vocational Education, 1989), p. 99.

<sup>136</sup>The role of postsecondary institutions in serving individuals is discussed in chapter 8.

<sup>137</sup>Shelli Bischoff, Red Rocks Community College, personal communication, Mar. 28, 1990.

<sup>138</sup>Joe Hopkins, South Carolina Board for Technical and Continuing Education, personal communication, Mar. 28, 1990.

<sup>139</sup>Example drawn from American Association of Community and Junior Colleges, *Keeping America Working Through Partnerships with Small Businesses*.

<sup>140</sup>Information provided by Kathryn Baker Smith, North Carolina Department of Community Colleges, Apr. 13, 1989.

<sup>141</sup>U.S. Congress, Office of Technology Assessment, *Making Things Better*, op. cit., footnote 63, p. 177.



training needs, and to help clients design or procure training.<sup>142</sup>

Massachusetts has also started to link industrial extension with training. The Center for Applied Technology (CAT), a division of the Massachusetts State Centers of Excellence Corp., promotes “skill-based automation.”<sup>143</sup> Its agenda includes information and support, research, and technical assistance to small and medium-sized manufacturers. CAT consultants conduct audits not only of client firms’ technology but also their workforces. Typically, the consultant forms a team of managers and shopfloor workers to identify both training and technology needs. Although CAT is less than 3 years old and has provided direct technical assistance to only 15 firms thus far, its initial efforts look successful.<sup>144</sup>

For example, at Pneumatic Scale Corp., a 100-year-old manufacturer of packaging equipment, a CAT consultant helped form a joint union-management committee. The committee involved shopfloor workers in designing training to integrate their mechanical work with the automated manufacturing cell that was to be installed. The workers identified a need for integrated training in machining and electronics. CAT worked closely with a State training agency—the Bay State Skills Corp.—to obtain funding for the training and found a local technical institute to provide it. The workcell was installed in September 1989, and 70 percent of the company’s 60 shopfloor workers are currently enrolled in the newly designed training. The company president feels that CAT assistance has been vital to his attempts to increase both domestic and export sales.

In a smaller project for the Southbridge Sheet Metal Corp., CAT helped the company integrate its automated design and manufacturing systems. Over an 18-month period, CAT designed the software to link the two systems and worked with a private technical school to train the workers in how to translate the CAD drawing to the CNC punch.

State and Federal industrial extension services are slowly learning that small firms need more than just

the latest hardware—they need help in benefiting from the technology, which includes training the workers. At the same time, studies of State training programs show that training is most effective when it is part of a broader strategy to achieve clear business goals.<sup>145</sup>

### *The Substitution Question*

The growing State role in funding employer training raises important public policy issues. When the programs are focused exclusively on industrial recruitment, critics contend that existing businesses suffer from subsidized competition.<sup>146</sup> In reply, many States have added programs subsidizing training for existing firms that create new jobs, and other States have created training programs for existing firms. But this effort to spread the subsidies more evenly can never be completely successful. The States cannot afford to provide training subsidies to all businesses, and those who are not helped can justifiably complain that they are being hurt by government intervention in the market.

Closely related is the substitution issue. There are two questions: 1) Are companies using State training funds to support nontraining activities? and 2) If the money is being used correctly, would the firms have trained their workers anyway, in the absence of the State subsidy?

The first question was raised by unhappy workers at Mazda Corp.’s Flat Rock, Michigan, plant, which received \$19 million in State training assistance. The workers contend that many of the hours billed to the State as “on-the-job training” were actually spent in other activities, including production work with the assembly line at full speed, and maintenance.<sup>147</sup> This danger—that the employer can use the State training assistance for productive work—was assessed in the NEA study of training grant programs in California, New York, Illinois, and Missouri. The study concluded that the danger would be less if the States limited subsidies to formal

<sup>142</sup>*Ibid.*, p. 181.

<sup>143</sup>Frank Emspak, “Skills-Based Automation: Can It Succeed in America? A Case Study,” paper prepared for the 11th Annual Congress Of the International Federation of Automation and Control, Tallinn, Estonia, July, 1990 (New York, NY: Pergamon Press, forthcoming in 1990).

<sup>144</sup>John Hoops, CAT, personal communication, May 30, 1990.

<sup>145</sup>Creticos and Sheets, *op. cit.*, footnote 26, p. 7.

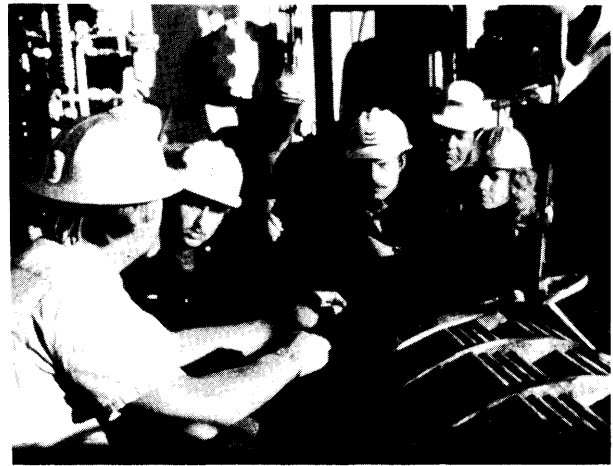
<sup>146</sup>“Taking Care of Business,” *op. cit.*, footnote 124, p. 28.

<sup>147</sup>Kertesz, *op. cit.*, footnote 116, p. 52.

classroom or laboratory training, which can be clearly identified as training time.<sup>148</sup>

The second question appears less serious in light of the case studies of 24 firms that received State training grants. State funds helped the companies overcome many barriers to doing their own training—poor access to training experts, lack of knowledge about how training might improve business performance, poor labor-management relations, concerns about the loss of trained workers, and bad experiences with prior training efforts.<sup>149</sup>

Illinois' Prairie State 2000 Program requires firms to demonstrate financial need for the training grant. Although this requirement is an important way to safeguard public funds, most of the case-study firms saw training as a low-priority investment. Without State assistance, even those companies that did have the internal funds to support training were unlikely to spend it for this purpose.<sup>150</sup>



*Photo credit: American Petroleum Institute*

Many forces drive the need for increased investment in worker training. Here, offshore oil platform workers receive a briefing on safety procedures before starting to clean and replace a heat exchanger bundle.

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<sup>148</sup>Creticos and Sheets, *op. cit.*, footnote 26, p. 84.

<sup>149</sup>*Ibid.*, p. 58.

<sup>150</sup>*Ibid.*