



You Can't Get There From Here Gauging the Demand for Education and Training by High-Tech Employers

Everybody knows that in today's economy, high-tech is "where the action is." Ask someone for a working definition of "high-tech," however, and the answer almost always confounds means and ends. Make the question more technical—as in, "Do high-tech firms train their employees differently from other firms?"—and there simply is no ready response.

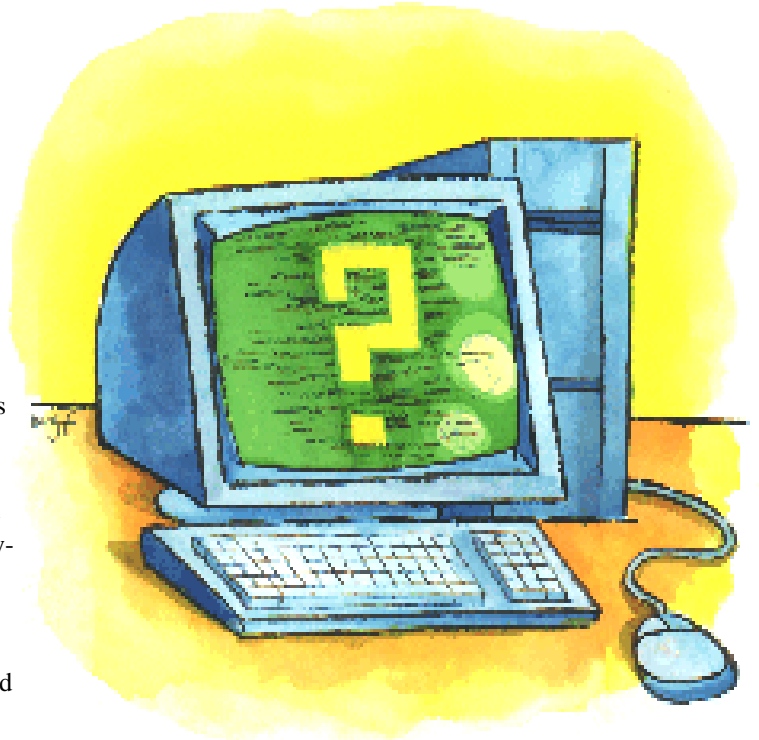
A team of researchers at the University of Pennsylvania's Institute for Research on Higher Education (IRHE) discovered this fact when seeking to help policy-makers wrestle with an apparent technical skills shortage among American workers. Their question simply asked, "Are high-tech employers spending too much money training their workers in skills they should have gained in high school and college?"

The problem was not a lack of data on training. The National Center for Postsecondary Improvement's (NCPI) National Employer Survey (NES) provided a wealth of detailed information on the current training practices of a wide range of employers and job classifications. Rather, the issue was that the standard definition of jobs and industries used by the NES—and every other major labor market data source—emerged from an industrial mindset that predated the technological revolution. Those classifications and definitions reflected the nature of the product rather than the processes of production.

In this installment of *The Landscape*, IRHE researchers Robert Zemsky and Ricki Gever Eisenstein report on their somewhat indirect path to analyzing data from the NES on the demand for training and education among employers who differ in their use of technology in the workplace.

Making Measures

Has the technology revolution affected the need for employers to provide training and education in order to meet industry skill requirements? Data from the 1997 NES, developed by IRHE and administered by the U.S. Bureau of the Census, suggest that it has. As the workplaces in this represen-



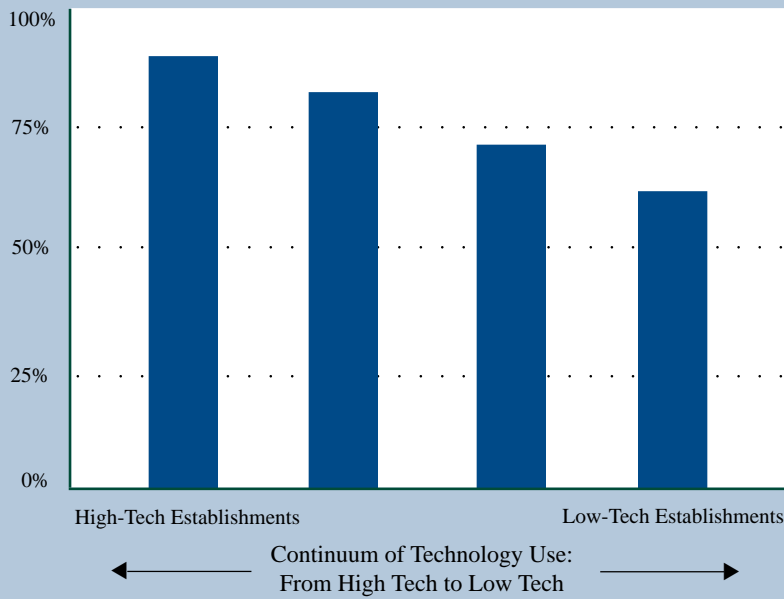
tative sample of U.S. establishments increase their use of technology, they spend more time and money training their workforces.

While the key question is the extent to which high-tech establishments equip their workforces to use electronic technology and new production methods, the initial task is to define and then identify high-tech employers. The IRHE team began by defining "high-tech firms" as having the following characteristics: a high proportion of the establishment's front-line staff uses computers to do their jobs; a high proportion of its workforce is comprised of technicians; and a high proportion of its equipment is less than one year old. For each of these criteria, a "high proportion" was defined as being at or above the 75th percentile for the 1997 administration of the NES. Among the 2,301 establishments reporting data for all three criteria, just 3.3

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Chart 1

Average Percentage of Establishments Providing Training, by Technology Use



tech,” those meeting two criteria are “mid-tech,” those meeting one criterion, “mid-to-low-tech,” and those meeting none are “low-tech.”

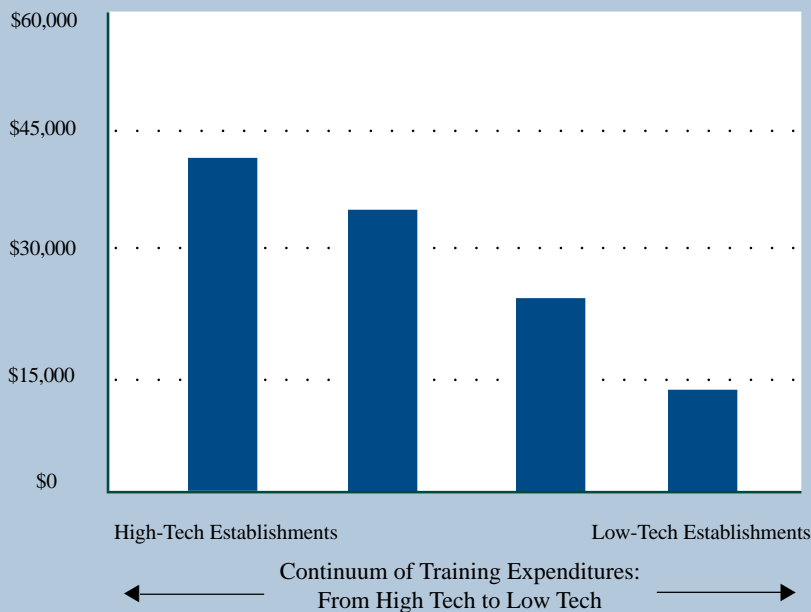
The Tech Factor

Although being a high-tech workplace was not associated with whether or not an employer had a formal training policy, high-tech establishments were more likely to pay for or provide formal training to their employees (86 percent) than low-tech ones (64 percent). As Chart 1 shows, the probability that an establishment paid for or provided training increased proportionally with the use of technology.

High-tech establishments not only offer training at a substantially higher rate than low-tech employers, they also spend almost three times as much on training. Chart 2 depicts the dramatic and proportional drop in training expenditures along the technology continuum. While high-tech employers spent an annual average of \$40,580, low-tech establishments spent only \$14,533. High-tech employers also offered more formal training to their employees during normal working hours.

Chart 2

Average Training Expenditures of Establishments, by Technology Use



Establishments with the greatest technology use are also far more likely to provide varied types of training to their employees—including managerial, supervisory, technical, office/clerical/sales/customer-service, and production-related—than all other establishments combined (Chart 3). For example, as shown in Table 1, a greater percentage of high-tech employers provided computer/new-equipment training to all types of employees. Overall, between 90 and 100 percent of high-tech establishments provided such training to their workforces in 1997, while the average rates of all other employers (called “lower-tech establishments”) ranged from 79 to 93 percent, depending on the type of employee.

percent ranked at the 75th percentile or higher on all three.

To determine differences in firms’ training practices, a scale was created based on the three “high-tech” criteria. Establishments meeting all three criteria are considered to be “high-

High-tech establishments also reported greater investment in the customer-service side of business—but for unexpected groups of employees. Most establishments provided training

in sales and customer service to their office/clerical/sales/customer-service staff in 1997. But the rates for establishments providing such training for other types of employees were markedly different. A higher percentage of high-tech establishments (84 percent) trained their managers and professionals in this area—9 percentage points higher—than their lower-tech peers (75 percent).

The difference between the rates of high-tech establishments that trained supervisors in sales and customer service and those of all other establishments is even more dramatic: 87 percent of high-tech employers provided supervisors with sales and customer-service training, while only 66 percent of lower-tech employers did so. Employers reported an even greater differential for training production employees in this area: 85 percent of high-tech employers versus 72 percent of lower-tech establishments. It seems that, in the high-tech setting, *everyone* is being given customer sales and service training. An emphasis on the customer in these workplaces is clearly becoming a corporate priority.

Interestingly, high-tech workplaces were not considerably more likely than lower-tech workplaces to train their workers in areas often deemed essential to establishing high-performance work systems: training

Chart 3

Average Percentage of Establishments Offering Training, by Training Type

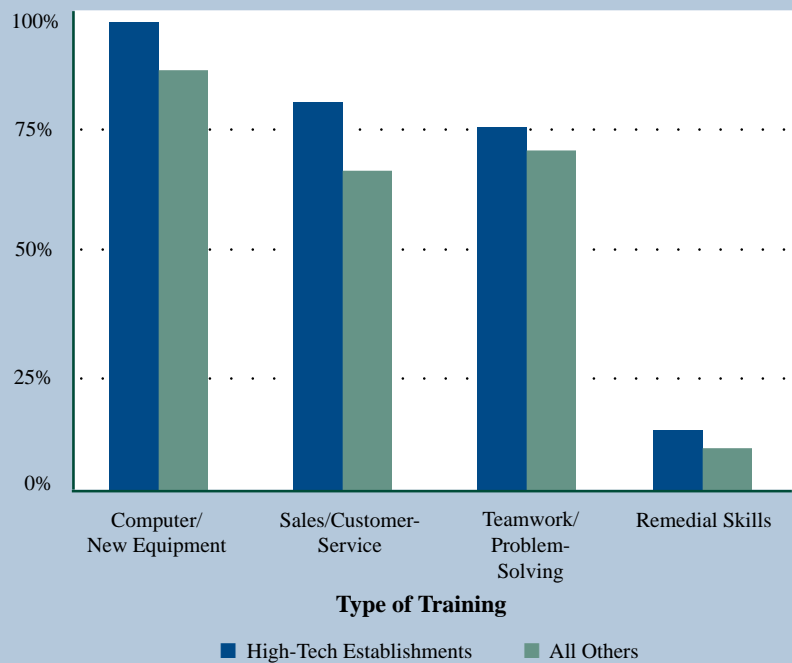


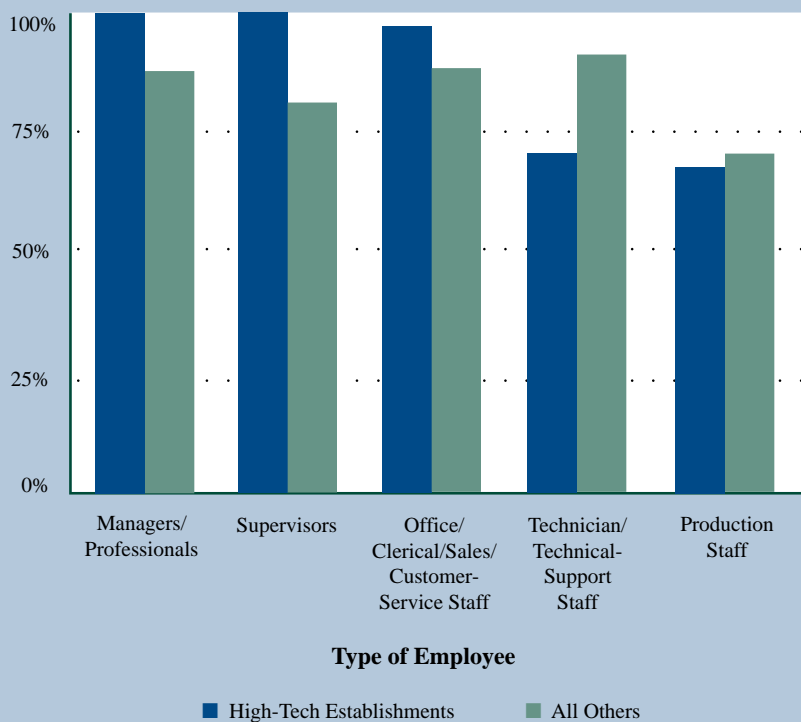
Table 1

Average Percentage of Establishments Providing Training, by Employee and Training Type, and Level of Technology Use

	Computer/ New Equipment		Sales/ Customer Service		Teamwork/ Problem-Solving		Remedial Skills	
	High-Tech	All Others	High-Tech	All Others	High-Tech	All Others	High-Tech	All Others
Managers/Professionals	90%	81%	84%	75%	76%	84%	N/A	N/A
Supervisors	100%	80%	87%	66%	87%	85%	48%	8%
Technicians/Technical-Support Staff	100%	89%	68%	41%	70%	57%	0%	7%
Production Staff	100%	79%	85%	72%	77%	76%	4%	18%
Office/Clerical/Sales/Customer-Service Staff	99%	93%	67%	66%	68%	65%	5%	13%
All Employees	98%	84%	78%	64%	75%	73%	14%	12%

Chart 4

Average Percentage of Establishments Offering Tuition Reimbursement, by Type of Employee and Level of Technology Use



in teamwork and problem-solving is simply not associated with the presence of the criteria the IRHE team used to define high-tech workplaces. Only for technicians did a substantially greater percentage of high-tech employers provide teamwork and problem-solving training: 70 percent of high-tech establishments compared to an average of only 57 percent of all other establishments combined.

On average, a similarly low rate of high- and lower-tech firms provided training on remedial skills across employee types (Chart 3). Yet, one cell in Table 1 stands out: remedial skill development for supervisors at high-tech establishments. High-tech firms provided six times as much remedial training to their supervisors (48 percent) as all of their lower-tech peers com-

bined (8 percent).

On the other hand, a substantial average percentage of both high-tech (87 percent) and lower-tech employers (82 percent) provided tuition reimbursement across their employee types. A vast majority of employers are willing to invest in the educational quality of their workforces.

A look at the rates for individual types of employees reveals interesting patterns. All high-tech establishments reported offering tuition reimbursement to both managers/professionals and supervisors, compared to only 86 and 81 percent respectively of lower-tech establishments. A 10-percentage-point differential that favors high-tech employers also exists in the share of establishments providing this benefit to their office/clerkal/sales/customer-

service staff: 96 versus 86 percent, respectively.

Yet, a greater share of lower-tech employers (87 percent) offered tuition reimbursement to their technicians/technical-support staff than high-tech establishments (71 percent). Given the need to constantly upgrade technicians' skills due to the rapid pace of technological innovation, this finding is puzzling. The most likely explanation is a tendency on the part of high-tech employers to buy rather than make high-skilled employees—though the differences are not as dramatic as some would have policy-makers believe.

Perspective

Beyond supporting the assumption that high-tech workplaces require higher levels of skill from their employees, the IRHE analysis points out the misconceptions that can result when popular notions are more advanced than technical definitions. In many ways, it is all but impossible to determine if the popular lingo is right—that technology use is driving a spiraling increase in demand for higher skills and employer investment in training economywide.

Even when the identity of high-tech firms is interpolated, they still do not represent a very large proportion of American establishments: only 3.3 percent of surveyed employers were ranked as being “high-tech” in this analysis. The nation's instincts may be right—high-tech employers and industries are where the action is. And the differences in the demand for skill and the supply of training between these firms and those with lower uses of technology are startling. But to understand their true impact on major policy issues, educators, employers, and policy-makers will have to rethink Census, industrial, and occupational categories to reflect a changing—but not yet transformed—world. □