Research Capsules

TOWARD IMPROVED PRODUCTIVITY

Research and the data it generates can be powerful tools to improve organizational productivity and competitiveness, which are key concerns in many industries.

The three projects described below illustrate ways in which quantitative and qualitative research methods can be used to identify industrywide concerns about productivity, to analyze training needs and design training agendas that lead to productivity advantages, and to measure productivity increases that occur as a result of total-quality management efforts.

These research projects were conducted in the construction, automotive, and defense industries—all hard hit by today's economic climate. But the findings and approaches are valuable for other industries as well.

Focus Moves From Staffing to Productivity

In 1992, FMI Corporation surveyed about 2,500 U.S. contracting firms. The purpose of the survey was twofold. The researchers wanted not only to identify the industry's training practices, but also to compare the findings with those from surveys of training practices conducted in 1989 and 1990. That comparison could help them set baseline measures to gauge significant training trends in construction.

The survey report may be especially valuable to HRD practitioners who work with the construction industry and to those who want to undertake similar studies in other industries.

The survey's 29 questions covered such topics as market and management challenges, the sources of training investments, and TQM processes. Responses are grouped by a variety of factors including construction type, revenue, and the role of unions. The figure, "Construction-Industry Survey Results," shows the responses to a question on how the training function is managed in respondents' organizations.

Three major trends emerged from the survey:

- Contractors believe in the value of management training and act on their convictions.
- Contractors see productivity as the key to greater competitiveness.
- Contractors are discovering that one of the best tools for improving productivity is more effective planning.

According to the study, contractors thought in 1989 that the industry had concluded perhaps its most successful period in history. But by 1991 the longest peacetime expansion had ended, and contractors had a more sobering view of the future. From the vantage point of 1992, priorities had been shuffled. The researchers saw the effect of the recession on training and the ways in which contractors are adjusting for an era with vastly different priorities.

For example, in the prerecession years of the 1980s, the greatest challenge to future success in the construction industry, according to respondents, appeared to be a looming staff shortage. But with the recession came downsizing, layoffs, and often a surplus of skilled available labor. Now, larger companies see competition as the greatest challenge; smaller companies see declining markets as the greatest challenge. Both views reflect the reality of a more competitive marketplace in 1992.

In the 1989 survey, responding companies saw leadership and supervisory skills as critical for future success. In 1992, the skill identified for future success was project

Three research projects help organizations improve productivity in the construction, automotive, and defense industries.

Construction-Industry Survey Results

Here are the responses to the survey question, "How is the education or training function of your company managed?"

By Construction Type	General	Heavy			Total
"It's a full-time responsibility."	19.14%	9.68%			18.58%
"When time from other responsibilities permits."	33.95%	41.94%			35.18
"We use an outside instructor or consultant."	6.79%	6.45%			7.51%
"We have no formal function."	28.40%	38.71%			29.64%
Other	11.73%	3.23%			9.09%

By Revenue of Respondent's Firm	Under $30,000	$30,000 to $74,900	$75,000 to $199,900	$200,000 or more	Total
"It's a full-time responsibility."	10.17%	16.67%	19.35%	32.50%	18.33%
"When time from other responsibilities permits."	40.68%	35.56%	32.26%	32.50%	35.46%
"We use an outside instructor or consultant."	5.08%	7.78%	12.90%	2.50%	7.57%
"We have no formal function."	40.68%	35.56%	23.19%	10.00%	29.88%
Other	3.39%	4.44%	11.29%	22.50%	8.76%

By Union Status of Respondent's Firm	Union	Nonunion			Total
"It's a full-time responsibility."	18.99%	17.35%			18.33%
"When time from other responsibilities permits."	30.38%	41.84%			35.46%
"We use an outside instructor or consultant."	8.86%	4.08%			7.57%
"We have no formal function."	36.71%	25.51%			29.88%
Other	5.06%	11.22%			8.76%

management, followed by leadership and supervisory skills, scheduling, and TQM.

In the 1989 survey, quality-management skills ranked low, even with large contractors. In 1992, quality management took a significant upward swing, particularly with large contractors, probably reflecting the prevalence of TQM efforts.

Among the survey findings:

Growth in internal management training significantly outpaced that of technical and safety training. The amount of money spent on internal technical and safety training is up slightly. But the amount of money spent on internal management training is up substantially.

For example, in 1989, 21 percent of contractors spent more than $25,000 on internal technical or craft training. In 1992 the percentage was 23 percent. In 1989, 34 percent of contractors spent more than $25,000 on internal safety training. In 1992 that percentage rose to 39 percent.

On the other hand, in 1989, only 19 percent of contractors spent more than $25,000 on management and supervisory training. In 1992 the percentage rose significantly, to 35 percent.

Most contractors spend $250 to $499 per person annually on office-management and field-management training. But they spend less than $100 per person for training their technical and craft employees.

Contractors see many benefits to supervisory training, including improved productivity and reduced turnover. More than 65 percent of contractors of all types, sizes, and status believe that every dollar they spend on supervisory training yields at least a 10 percent return.

Improving field management is still the best method of increasing productivity. In 1990 and 1992, field-management effectiveness was rated as the greatest predictor of increased productivity. It still outdistances the next most important factor (declining skill of craft labor) at least 3 to 1 by company type, revenue, and status.

Although all contractors rated planning as their top challenge, the perceived importance of planning—and the time spent planning—declined between 1989 and 1992. Despite the perceived need to plan—and to improve planning skills—the average superintendent spent a full two hours less time planning on the job in 1992 than in 1989.

At the same time the gap narrowed between large and small firms in their perceptions of the need for planning. In 1990, nearly twice as many large as small companies said planning improves productivity by at least 10 percent. In 1992, more small

companies than in 1990 are also saying planning improves productivity by that margin.

About 93 percent of all the companies surveyed believe that effective planning increases labor performance by at least 5 percent. About 60 percent of the respondents believe the improvement is more than 10 percent.

For a copy of the *U.S. Construction Industry Training Survey,* contact David Cheatham, FMI Educational Services Group, 5151 Glenwood Avenue, Raleigh, NC 27612; 919/782-8400.

Training Needs for New Technologies

In *Auditing Technological Readiness: Requirement For Competitive Success,* Robin Widgery and Jack Martin report on the process by which a large industrial firm examined the skill levels of its engineers-in-manufacturing. The firm surveyed 5,000 employees and received responses from 3,800. The purpose of the survey was to identify training needs that would help it prepare for a smooth integration of the new technologies and methods that it expected to use in the immediate future.

Researchers pointed out that, more today than ever before, competitiveness is a matter of continuous pro-

ductivity and quality improvement. In order to compete in an international environment, domestic manufacturers have invested billions of dollars during the past decade in cutting-edge technologies and new techniques.

But employers face significant problems related to the integration of new technology—among them is a concern for the level of misfit between employee skills and job requirements. This study provides an example of how one firm coped with a knowledge and skills crisis resulting from the demand for swift integration of new technology.

The essential research question was this: What does the engineering staff know and what does it need to learn? From the survey results, management developed training curricula and personnel policies to help the firm get the most out of new technologies.

Some of the specific objectives of the survey:
▶ to define current and future technologies, methods, and processes used to manufacture the product
▶ to measure the technical competencies of all engineers-in-manufacturing within these technologies, methods, and processes
▶ to measure the discrepancy between present technological skill applications and skills needed for future applications
▶ to prescribe training priorities among all technologies, methods, and processes in order to help the organization integrate new technologies smoothly and efficiently.

In preparation for the survey, a steering committee of industrial engineers spent several weeks identifying 64 technologies, methods, and processes required for manufacturing the company's products.

Each of the 64 technologies, methods, and processes became a questionnaire item. Researchers asked respondents to indicate their levels of knowledge in each area.

Respondents also answered questions about the likelihood of change over the following five years in the amount of usage of each technology, process, and method. The two questions: "To what degree do you currently use these technologies, processes, and methods in your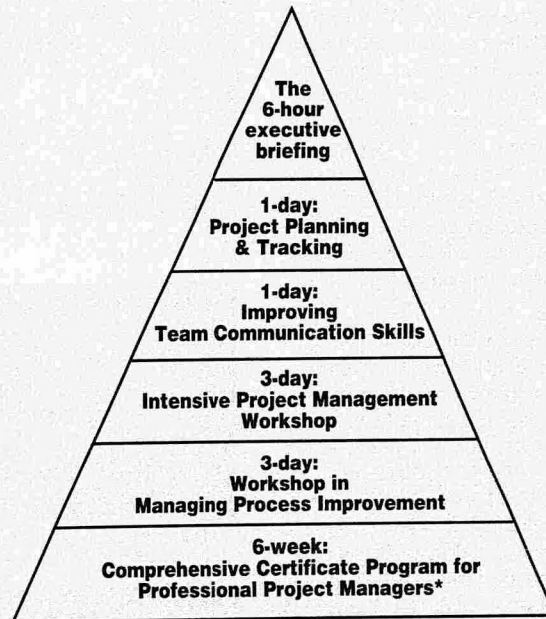 job?" and "To what degree will you likely use these technologies, processes, and methods in your job in the next five years?" Responses ranged from "no usage" to "high usage."

The responses to the knowledge question and the usage questions for each item yielded a change score. From this was calculated the amount of training emphasis needed in the different subjects in order for the company to prepare for the smooth integration of the new technologies and methods.

From those comparisons, the firm was able to create a scored list of the 69 technologies, processes, and methods. Those falling near the bottom of the list represented knowledge surpluses or obsolescence within the organization at the time of the survey.

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The technologies, processes, and methods near the top of the list, on the other hand, represented knowledge and skill liabilities. Too few employees possessed competence in those subjects to prepare the organization to meet its future competitive challenges. Of the top 15 deficit technologies, processes, and methods, 13 related to various computer applications.

According to the researchers, this method of analysis enabled the company to design training agendas for the entire corporation, for each division, and for each plant. Over the next five years, the company realized an important productivity advantage in its industry.

The audit of company knowledge and skills enabled the firm in this study to develop its training curriculum based on a productivity imperative. Specifically, it enabled the firm to assess the discrepancy between its present knowledge assets and the assets it would need to compete in the future.

Researchers noted that this type of far-reaching research can provide a model for other manufacturing firms that have been caught in the race for the cutting edge of technical applications. For a copy of the report, contact Robin Widgery, Social Systems Research Institute, 1176 Robert T. Boulevard, Flint, MI 48503; 313/694-3537.

TQM Improves Productivity

Thomas Blackburn, Jr.'s, recent dissertation, "A Report of the Department of Defense's Implementation of Total Quality Management," studied one Department of Defense organization's process in implementing TQM. The research questions for this study covered four areas:
▶ the organization's attempt to change its corporate culture through the implementation of TQM
▶ upper-level management's involvement in and commitment to TQM implementation
▶ TQM's effectiveness in improving employee productivity
▶ TQM's effectiveness in improving employee attitudes.

This assessment—conducted four years after DOD issued a 1988 TQM master plan and two years after the organization started its own implementation of TQM—found different degrees of success in each of the areas analyzed. The researcher found evidence that some progress had been made toward achieving a change in corporate culture and increasing productivity. But the results regarding the commitment of senior leaders and improvements in employee attitudes were inconclusive.

Subjects responded to survey questions concerning culture change, commitment, productivity, and attitude. The responses were grouped according to organization level. Thirty-two respondents were workers (including first-line supervisors and action officers), 11 respondents were division chiefs (the organization's midlevel managers), and eight respondents

were directors (senior managers).

Let's look at an analysis of the responses to the research questions in each of the four targeted areas.

Culture change. The study led to a positive conclusion that a culture change is not yet complete, but definitely is occurring.

A significant number of respondents thought quality was having a positive effect on organizational culture (47.9 percent of workers, 27.3 percent of midlevel managers, 58.8 percent of senior managers, and 46.0 percent of all respondents).

But a sizable number of respondents were neutral with regard to TQM's effect on culture (29.2 percent of workers, 24.2 percent of midlevel managers, 35.3 percent of senior managers, and 29.4 percent of all respondents).

Respondents with a negative view of TQM were in the minority (24.5 percent overall), with a disproportionate percentage (48.5 percent) at the middle-management level. Several respondents noted that TQM may be viewed negatively by this group because it has the potential of doing away with their jobs.

Commitment. In the second subject area—senior leaders' commitment to TQM—the study's results were ambiguous. Senior managers saw themselves as being committed to TQM (77.8 percent gave positive responses). But workers and middle managers were unconvinced:

▶ Among workers, 37.1 percent said senior managers were committed, 22.7 percent answered neutrally, and 40.2 percent answered negatively.

▶ Among middle managers, 21.2 percent said senior managers were committed, 21.2 percent answered neutrally, and 57.6 percent answered negatively.

Workers and midlevel managers cited numerous examples of upper managers who reverted to the old-style, "do what I tell you because I tell you" approach in stressful situations. The researcher concluded that this does not mean the upper managers were not committed to TQM. More likely, it reflects the pressure of managers' jobs, their unfamiliarity with TQM, and the fact that the cultural change was not yet complete.

Productivity. In response to the third area of concern, the researcher con-

cluded that there had been some improvement in productivity. More than 60 percent of the responses to the question on this issue indicated that TQM was having a positive effect on productivity, with workers (65.6 percent) being the most positive.

Attitudes. In response to the issue of attitudes, the study results were once again ambiguous. Overall, a sizable number of people thought attitudes had improved (46.1 percent of workers, 26.3 percent of midlevel managers, 55.0 percent of senior managers, and 42.4 percent of all respondents).

But many respondents were either neutral or negative about TQM's effect on attitude. Neutral responses were given by 20.2 percent of workers, 32.9 percent of midlevel managers, and 20.0 percent of senior managers, with 23.3 percent of all respondents answering neutrally. Negative answers were given by 33.7 percent of workers, 40.8 percent of midlevel managers, and 25.0 percent of senior managers, with 34.3 percent of all respondents answering negatively.

Other observations. During the interviews, several issues surfaced that the researcher believes merit further consideration. Among these are concerns about empowerment, which was a

key issue for many respondents.

There were many positive comments about empowerment, but several people thought that empowerment should be extended to staff people as well as people in the field. They saw lower-level people with very limited experience being empowered, while very experienced staff people were not empowered even to do their own jobs.

It was not only workers who had concerns about empowerment. Senior managers made comments along the same lines. They said that empowerment was not being passed down in the headquarters itself. Others, including two workers, a middle manager, and two senior managers, complained about "micromanagement" and the lack of responsibility.

Blackburn believes that empowerment is the key to the successful adoption of TQM in this organization. The staff people who felt empowered by their supervisors were the ones who had the most positive view of the value of TQM. Staff members who felt they were not empowered were the most dissatisfied with TQM.

Blackburn speculates that perhaps one reason senior managers are buried under crushing workloads is that they are busy doing work that should and easily could be delegated to their employees. He suggests that one way for senior management to determine just who is capable of more responsibility is to give it to them.

If leaders are to be perceived as supporting TQM, and if the organization is to reap TQM's other benefits, Blackburn suggests that it will be necessary for leaders, especially at the most senior levels, to become more visible to all employees. He urges them to concentrate on promoting and protecting the core values of their organization.

For a copy of an article based on the dissertation, contact Thomas D. Blackburn, Jr., Bales Blackburn Associates, 103 North Alton Street, Lebanon, IL 62254; 618/537-2474.