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The Effects of New Work Practices on Workers

Michael J. Handel and David I. Levine¹

Abstract

The study of work and employment in the 1970s was shaped by a widely-cited report taking stock of the current workplace and proposing broad changes (*Work in America* [HEW 1973]). In this chapter we review research on how employee involvement practices affect job quality and assess the extent to which they have delivered on their promise. Overall, we find that new workplace practices increase employee satisfaction and (on average) increase wages a small amount. Effects on employee injury rates are less clear. It is unclear if the small and inconsistent findings across many studies reflect variation in the seriousness of implementation (with many workplaces making few real changes), variation in the quality of the studies and measures, or true variation in effects. We conclude with some considerations of policy options.

Keywords: Work organization, employee involvement, employee satisfaction, wages, profitsharing, training

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The study of work and employment in the 1970s was shaped by a widely-cited report taking stock of the current workplace and proposing broad changes. Appearing after nearly thirty years of prosperity and economic growth, the *Work in America* (HEW 1973) report focused on how work could be made more satisfying, skilled, and participatory. Similarly, the 1990s also began with a widely-cited report advocating fundamental changes. However, *America's Choice: High Skills or Low Wages* (National Center on Education and the Economy 1990) focused on the need to restore American competitiveness and wage growth through tougher education standards, structured school-to-work transitions, one-stop job service and information centers, and incentives and assistance for firms adopting high-performance work systems to compete on quality rather than low wages.

Although policy-makers paid a lot of attention to these issues, policy changes were modest. Perhaps in spite of this relative neglect, the economy did very well in the 1990s in terms of job growth. The economic recovery in the 1990s left one agenda item conspicuously unresolved: securely improving the quality of jobs for the middle and lower segments of the workforce. Thus, as the 1990s boom ended, inequality remained extraordinarily high, living standards improved little for the vast majority (Mishel, Bernstein, Allegretto 2005), and doubts lingered as to whether a credible model of high-quality employment had emerged to compensate for the waning influence of unions.

New work practices with higher levels of employee involvement and skill were viewed favorably by academics, policy makers, and firms, to judge by various studies of their prevalence (Osterman 1994, 2000; Frazis, Gittleman, Horrigan, and Joyce 1998; Cappelli 1996; Cappelli and Neumark 2001; Freeman and Roger 1999). While definitions vary, most would agree that employee involvement (EI) practices include job rotation, quality circles, self-directed teams, and

most implementations of Total Quality Management, as well as supportive practices such as enhanced training and non-traditional compensation (e.g., pay for skill, bonuses, gain sharing, and profit sharing). In this chapter we review research on how employee involvement practices affect job quality and assess the extent to which they have delivered on their promise. We conclude with some considerations of policy options.

A number of arguments suggest employee involvement can help workers. Workers have insights into how to improve their jobs and most find that the opportunity to influence their work environment is intrinsically satisfying; employers find that productivity is enhanced as well. Management and workers can both gain if workers receive higher pay, greater job security, and improved working conditions in return for their contributions. Such involvement appeared to be one key to Japanese manufacturing success in the 1980s. In addition, the difficulty of sustaining traditional American industrial jobs has only increased as low-value-added jobs are moving abroad, and many have argued that American manufacturing workers can retain jobs in high-value-added operations, particularly those serving rapidly changing markets and using information technology, high skills and high employee involvement (Piore and Sabel 1984; Zuboff 1988; Appelbaum et al. 2000, pp.10f.).

However, studies also support a more cautious view, noting middle and lower management resistance to change (Zuboff 1988), token or faddish adoption (Abrahamson and Fairchild 1999), and poor execution (Vallas 2003). The harshest critics describe workplaces in which management uses employee involvement to control workers and intensify work (Graham 1993; Barker 1993) as part of a more general strategy to control labor cost, which may also include real wage reductions, union avoidance, outsourcing, offshore production, and less stable employment arrangements.

Adding to these theoretical disagreements are methodological challenges and differences in the execution of research on how new work practices impact worker outcomes, particularly wages. We summarize the research on wages and selected other outcomes and conclude with suggestions for how future research and policy can build on the lessons learned.

Theories relating workplace practices and employee outcomes²

There are at least five theories that might explain why workplaces with employee involvement, profit-sharing, and other new workplace practices might have different outcomes for employees than more traditional workplaces: human capital, compensating differences, efficiency wages, incentives and complementarity, and theories centering on conflict over distributive issues within the firm.

Human capital theory. Human capital theory argues that workers with higher skill levels receive higher compensation because they are more productive. Employee involvement may require workers with more general skills to perform more complex tasks, which might result in more rigorous selection and hiring criteria and increase the demand for and wages of more educated workers. New practices may also require more firm-specific skills, which would increase employer-provided training and wages as well.

Compensating differences theory. This theory argues that workers who face particularly desirable (undesirable) working conditions will receive lower (higher) wages (Williamson 1985, pp. 268 ff.).

If employees regard employee involvement as a benefit because problem-solving tasks and job redesign relieve the tedium of traditionally-organized work (Hackman and Oldham

² This section draws on Helper, Levine, and Bendoly (2002).

1980), then firms that have it could offer lower wages and workers would not be worse off. Conversely, if employee involvement requires extra effort and tighter work demands, then plants with employee involvement might offer better compensation.

Efficiency wage theories. Efficiency wage theories predict that paying higher wages may increase workers' productivity through three main channels. (Katz [1987] and Levine [1993] review this literature.) A higher wage may increase worker effort due to the greater cost of job loss, so workers would want to reduce the chances of being dismissed for low effort. A higher wage may also increase effort by increasing workers' loyalty to the firm, which may be especially important in systems that require greater discretionary effort from employees and in group activities such as problem solving in which effort and output are costly to monitor (Akerlof, 1982; Milgrom and Roberts, 1995). Indeed, the core concept of the mutual gains enterprise or high commitment systems (Walton 1985) is consistent with Akerlof's (1982) theory of labor contracts as partial gift exchange and the role of fairness conceptions in determination of expectations, effort, and wages. Finally, a higher wage may reduce firms' turnover and recruitment costs, which might also be important if EI (employee involvement) requires more careful recruitment or increased firm-specific training.

Incentives and complementarity. The prescriptive literature on organizational design emphasizes the importance of aligning decision making rights with incentives to make good decisions. If undertaken seriously, the use of greater employee involvement involves substantial changes in decision making rights because frontline employees collect and analyze more data and suggest and implement improvements. In these circumstances, it makes sense to structure incentives in ways that reward quality and improvement and align frontline workers' goals with their new authority (Milgrom and Roberts 1995; Levine 1995). Because workplaces with greater

employee involvement depend more on employee initiative, the theory of complementarities between involvement and incentives implies pay practices such as gainsharing, profit sharing, and stock ownership plans will be more common. If these forms of variable compensation substitute for base pay, shift earnings risk to workers, or are introduced in the context of concession bargaining (Bell and Neumark 1993), then one would observe lower regular wages in their presence, though perhaps less employment variability in some cases as well. However, if the firm's strategy is to introduce a supplement or at least avoid putting current pay levels at risk, then total earnings may be no different or slightly higher. If the practices work as intended and increase motivation and productivity, earnings may be significantly greater, assuming firms share gains with workers.

Conflict theories emphasize that employee involvement can shift bargaining power within the enterprise. To the extent employers become more dependent on hard-to-monitor discretionary effort of employees, employees' bargaining power can increase. High-involvement workplaces with just-in-time inventory make it easier for employees to disrupt the production process so that worker non-cooperation or other reactions to perceived unfairness are more costly to the firm.

At the same time, several authors have referred to high-involvement systems as “management by stress,” positing that employee involvement is simply a method of sweating the workforce and curbing worker power and influence. Firms reduce employee and union power by using ideological appeals, suggestion systems, and peer pressure in small work groups to instill a culture of company loyalty, appropriate workers' tacit knowledge, and enforce discipline (Graham 1993; Parker and Slaughter, 1988; Sheahan, et al., 1996). This view predicts increased

work loads, faster work pace, closer monitoring, and more job stress, without offsetting compensating differences such as higher wages.

Case studies provide examples of firms that devolve responsibilities to workers but refuse to increase wages (Bailey and Bernhardt 1997, pp.30f.; Zuboff 1988, pp.298f.). Press reports indicate that some employers, particularly when times are tough, ask for wage cuts, more skills, and increased participation simultaneously; such an effect implies employee involvement might be correlated with wage declines, but not cause them. Other press reports, though, suggest participatory workplaces are willing to pay higher wages.³ Some researchers argue that workers require union representation to give them the leverage to compel firms to share gains resulting from EI programs given the unequal bargaining power of firms and workers in the current environment (Black, Lynch, and Krivelyova 2004).

Total Quality Management and standardized work pose additional threats to worker safety and health. TQM emphasizes reduction in variation and is often combined with just-in-time inventory practices that eliminate buffer stocks and worker control over work pace in order to maximize total work time. The result can be more standardized and repetitive work and increased work loads that raise the risk of repetitive motion injuries such as carpal tunnel syndrome, confirming the suspicions of many that TQM represents a more developed form of Taylorism (Adler, Goldoftas and Levine 1997; Brenner, Fairris and Ruser 2004).

³ For business press accounts of wage concessions in firms that adopted high performance practices, see "The New World of Work," Business Week (Special Report, October 17, 1994, pp.86), "The Factory Worker," Business Week (September 30, 1996, pp.66), "The New Deal: What Companies and Employees Owe One Another," Fortune (June 13, 1994, p.50). For a contrary view, see "Breaking the Chains of Command," Business Week (Special Issue, "The Information Revolution" 1994, pp.113).

The possibility of conflict was most apparent with the reengineering movement in the 1990s, where the redesign of jobs (often involving both new information technology and increased worker autonomy) was explicitly tied to laying off the workers no longer needed after the resulting increase in efficiency (e.g., Hammer and Champy, 1993).

Methodological challenges

While theory and intuition suggest numerous hypotheses regarding EI's effects on workers, testing them conclusively can be difficult. For example, new work practices are not assigned randomly to employers or to workers, which can lead to bias. In some cases, prosperous firms both pay high wages and are more likely to introduce new work practices. In other cases, desperate firms both try new workplace practices and cut wages (Caroli and van Reenen 2001, p.1475). In addition, firms that enjoy above-average success with their workplace innovations may be more likely to respond to surveys than are those that are less successful. Thus, we cannot even be sure whether the average selection bias is positive or negative.

Selection effects also exist on the worker side because new work practices may lead firms to use more rigorous selection procedures and hire workers with greater human capital. Such selection can induce a positive correlation between wages and involvement even if the employees would have earned the higher wages without the involvement.

Cross-sectional data, which is a single snapshot of conditions at a number of workplaces, make it very difficult to rule out the possibility that preexisting differences between adopters and non-adopters account for observed differences in worker outcomes. Data collected before and after an organization adopts different practices would help isolate the effects of introducing the

change. However, longitudinal data can compound problems with measurement error and raise questions regarding the lag that is expected between treatment and outcome.

Measurement problems may be great because surveys almost always rely on a single informant per workplace. Multiple respondents in the same workplace typically have very different views of the same workplace practices (Wright et al. 2001). Even when respondents agree, they may all use different definitions than at other workplaces; thus, at one firm a "semi-autonomous work team" may be a totally autonomous group without outside direction while at another it may be a traditional workgroup with a supervisor who held a single team meeting six months ago. Such measurement error can make it very hard to detect true effects of new workplace practices.

Most of the different theories reviewed earlier imply that the different dimensions of employee involvement—increased task complexity, responsibility, autonomy, training, and gain sharing—are interdependent and mutually reinforcing. For example, it may be far more effective to both train frontline employees in problem-solving and permit them to solve more problems than to make either change alone. This interdependence implies that correctly specifying “high” versus “low” levels of employee involvement is quite difficult.

However, there are many EI practices, and theory does not provide clear guidance as to which bundles may be most effective, whether some practices are substitutes (e.g., employee stock ownership or profit-sharing) or complements, or even how to measure bundles (e.g., interaction effects, additive indices, factor analysis, cluster analysis, or *ad hoc* indexes). It is difficult to identify which workplaces have introduced a theoretically sound bundle of practices and which have not.

Some studies suggest the confusion extends beyond researchers to employers themselves. Most workplaces adopt a few practices (Osterman 1994; Gittleman, Horrigan and Joyce 1998; Forth and Millward 2004; Blasi forthcoming), not the coherent bundle of practices recommended by theory (Levine 1995; Milgrom and Roberts 1995). When employee involvement is not tried seriously, its lack of effects is not surprising. The research challenge is to identify the subset of workplaces with meaningful changes for workers.

Research on the relationship between EI and wages

Elsewhere we have reviewed in detail the results of over twenty academic studies of the effects of various EI practices and bundles on wages (Handel and Levine 2004). The results of the various estimates (adding a few more recent studies) are summarized in Table 1 according to effect size and study characteristics. In Panel A we distinguish whether the studies use nationally representative samples (which have the advantage that the results generalize to the whole economy) or focus on particular industries, firms, and establishments (which have the advantage that measures of workplace practices can often be more precise). In Panel B we divide the studies based on the several measures of employee involvement.

Because most studies estimated multiple models, there is no single best way to summarize the different studies. However, every effort has been made to include the best estimates from those studies for as wide a range of practices as possible. Where the EI variable was a standardized scale, the effect size equals the coefficient (i.e., effect of a single standard deviation), and where the EI variable was in percentage form, the effect size was based on multiplying the coefficient by 100.

Although three fifths of the coefficients are positive, the majority of both nationally representative and more focused studies indicate no statistically significant effect of EI on wages.

The results from industry- or firm-specific studies tend to be slightly more favorable than those based on nationally representative samples (Panel A). This result may be because the restricted sample controlled more effectively for unrelated differences between organizations, such as specific industry affiliation, that are associated with both the tendency to adopt innovative practices and workers' wages. Studies restricted to one industry or firm may also use more context-appropriate survey items that reduce measurement error. However, if these studies focused disproportionately on industries in which EI is intrinsically more effective, their results would not generalize to the overall economy.

In those studies where the effects of new workplace practices on wages are statistically significant, effects tend to be small and their causal status clouded by the possibility of selection effects. Most studies do not eliminate the possibility that high-wage establishments may adopt more high-involvement practices or high-involvement establishments may hire workers who would receive high wages at low-involvement workplaces. Almost all the negative effects are insignificant and the point estimates are small. A reasonable reading of the evidence suggests that EI's average effect is somewhere between zero and 5 percent, though larger effects have been found in a small number of cases. These estimates are well below those for the union wage premium (Freeman and Medoff 1984), but problems with measurement error biasing coefficients toward zero are also greater in research on employee involvement.

In Panel B, the small number of studies for most practices and the heterogeneity of measures across studies prevent strong conclusions. Results are most consistently positive for Total Quality Management, with all four studies finding positive effects and two reaching statistical significance. Conversely, three of the four studies examining job rotation found negative, but statistically insignificant, effects. None of the other programs (quality circles,

teams, alternative pay systems, or scales of employee involvement and other new work practices) show patterns that are distinctive compared with the overall average. Given the small number of studies of job rotation and of TQM, we cannot conclusively state that one set of programs is or is not consistently better or worse for employees. (The test of similar distributions of outcomes across programs is distributed $\chi^2(25)$ and is not significant at the 10 percent level.)

Some notable findings from the different studies are worth highlighting. Despite the attention to the importance of bundles stimulated in part by Ichniowski et al (1997), Cappelli and Neumark conduct one of the most thorough and thoughtful tests of the bundling thesis and conclude that "there is not consistent evidence of statistically significant effects of bundles of work practices" (2001, p.760).

Osterman conducted an initial longitudinal study and concluded, "The bottom line is that there is very little evidence that HPWOs [high performance work organizations] have delivered on their promise of 'mutual gains'" (2000, pp.190f.). However, in more recent work, Osterman (2004) finds a wage premium for blue-collar manufacturing workers of just under 4 percent, consistent with our prior conclusions. Appelbaum et al (2000) also find positive effects of a similar magnitude in their thorough survey study of the steel, apparel, and medical electronics industries.

A final hypothesis from conflict theories is that employee involvement might benefit workers most when unions are present and, therefore, can bargain for a share of any productivity increases. While plausible, the results remain mixed (with support from Black and Lynch [1997, 2000] but not Handel and Gittleman [2004]).

Other outcomes

While economists have emphasized studies of wages, psychologists more often look at the relation between EI and job satisfaction. These results are more consistently positive than those for wages (Cotton 1993; Freeman and Rogers 1999; Appelbaum et al. 2000; Hodson 2001, p.190; Hunter, MacDuffie, and Doucet 2002). Thus, any increase in wages cannot be explained as compensation employees receive for the burden of autonomy. Given the very large emphasis that the original *Work in America* report gave to the link between repetitive jobs and employee dissatisfaction, these results are encouraging.

There have been fewer studies of the effects of employee involvement on safety and on job security. Safety professionals consider employee involvement a key element in reducing injuries (e.g., Ariss, 2002). The skills of problem identification and problem solving that are the basis for EI can help reduce hazards as well as improve quality. At the same time, while quality programs often increase employee involvement, they also try to routinize and standardize tasks. High rates of repetition and increased monitoring can increase stress and repetitive motion injuries, potentially worsening the safety record of plants with quality programs (as found by Brenner, Fairris and Ruser 2004).

The relationship between employment security and new workplace practices promoting higher employee involvement remains less well-studied, in part due to the scarcity of longitudinal data. Methodological issues described previously, such as selection effects and the indeterminate length of lagged impacts, also complicate efforts to establish causality.

With these cautions in mind, some evidence suggests that new workplace practices reduce involuntary turnover and lengthen employment spells, although all results are somewhat ambiguous. On the one hand, organizations trying to involve employees in decisions are more

likely to provide formal promises of employment security than are other organizations (Levine and Parkin 1994; Helper, Levine and Bendoly 2002; Brown, et al., 1997; Ichniowski, Shaw, & Prennushi 1997). On the other hand, such promises remain the exception (see, e.g., Forth and Millward 2004). Moreover, employee involvement in the early 1990s was associated with *higher* probability of layoffs between 1995 and 1997 in a national sample (Osterman 2000), while it had no effect on survival in auto suppliers over a similar time period (Helper, Levine and Bendoly 2002). Lawler, Mohrman and Benson (2001, p. 171) find no relation between downsizing and employee involvement in a sample of very large employers. Cappelli and Neumark (2004) find that high-involvement practices are associated with below-average employee turnover in manufacturing but not in other sectors. Black, Lynch, and Krivelyova (2004) find that different high-performance work practices have positive and negative effects on the probability of employment reductions within manufacturing. Batt (2004) found that installation and repair workers in the telephone industry who worked in self-managed teams felt greater subjective job security than otherwise similar workers, while supervisors of such teams expressed less job security than their counterparts in traditional systems. In Australia, Drago found that high-involvement practices are associated with above-average employment security but are also found in some “disposable” workplaces with low employment security (1996).

Summary

The recent growth of research interest in employee involvement reflects both employee involvement’s growing use within the workplace and hopes that it might be a source of good jobs for workers. From the current evidence it appears that, if the reforms are serious, EI can improve organizational outcomes. The evidence on workers’ compensation is mixed. Our reading is that

most involvement plans have no effect on pay, in large part because the efforts were not that serious and not much changed in the workplace. At the same time, the average wage effect appears to be a few percentage points increase. There is no evidence that employee involvement programs decrease compensation and no consistent evidence that compensation rises by more than perhaps 5 percent. The evidence is too weak to know where in that range the average effect lies, although we suspect that more serious efforts would be at the high end of the range.

As noted above, employee involvement's effects on employee satisfaction are more consistently positive than are the results on compensation. Unlike the original *Work in America* report, this review puts more emphasis on compensation than on satisfaction -- largely due to the composition of the research literature. That shift in the literature, in turn, partly reflects the training of economists; as they have increased their research on this topic, their standard economic outcome of compensation looms larger. The increased emphasis on pay also reflects the slow growth of median pay since the *Work in America* report was released. Pay was perhaps less salient a concern in 1973 given the rapid compensation growth in the 20 years prior to that report.

Despite proponents' hopes, the wage effect of new workplace practices remain significantly below the union wage premium (Freeman and Medoff 1984), though the new practices also cover a larger proportion of the workforce. EI may be necessary to increase the number of high-wage jobs, but it is not sufficient.

While EI advocates argue that a wage premium due to improved productivity is more sustainable than (for example) a premium originating in union bargaining power, the evidence is (perhaps surprisingly) mixed on the relationship between employee involvement and employment security. Each of the theories discussed earlier may have some explanatory power,

but there is little evidence for strong effects. EI appears to have modestly positive human capital implications, though effects may be suppressed somewhat if training reduces starting wages, as human capital theory predicts. Similarly, firms may pay efficiency wages after implementing EI in order to elicit higher commitment and discretionary effort and minimize loss of training investments due to turnover. However, the small size of the EI premium also suggests that employers feel limited pressure to pay efficiency wages, perhaps reflecting workers' weak bargaining position.

The evidence on satisfaction suggests that wages may be held down by many workers' preference for high-involvement jobs, but there is little consistent evidence of greater employment security associated with EI that might also function as a compensating differential. The evidence on injuries suggests that a wage premium for EI may sometimes be a compensating differential for more negative working conditions in some cases.

Existing research suggests more strongly that when EI is not used as a form of speed-up it gives workers more autonomy, recognizes the value of their contributions, improves job satisfaction and feelings of voice, and often lowers quit rates. By mitigating the more negative aspects of hierarchy, EI represents another positive step in the evolution of management practice comparable to the earlier restrictions on the "foreman's empire" (Nelson 1975) that transformed the supervisory role from, at times, that of a petty dictator to the more constrained "man in the middle" (Whyte and Gardner 1945).

These findings do not support the most positive views that EI by itself can create a "high-road" solution to the problems of poor wage growth and increased inequality. At the same time, these findings do not indicate that management-by-stress is typical (because EI usually raises job satisfaction), nor do they suggest that higher demand for skills at high-involvement workplaces

(what economists call “skill-biased organizational change”) is a significant cause of inequality growth.

All conclusions regarding the effects of EI must be qualified by the recognition that existing research has not eliminated potential problems such as measurement error and selection bias. Indeed, to some extent it is not surprising to find such disparate results given the lack of agreement on the best measures of EI. Future research requires standard and more behaviorally concrete measures of various EI practices to improve comparability across studies, minimize measurement error, and distinguish strong from weak adopters. More attention must also be given to understanding organizational performance and worker quality prior to adopting EI to exclude the possibility that wage effects are biased by any preexisting differences between the wages of adopters and non-adopters.

Policy implications

Everyone would like to see the quality of American jobs improve. A generation ago, optimists thought that new workplace practices were the most attractive means to achieving that goal because of their potential to increase productivity, share gains, and increase satisfaction. There have been many private-sector permutations of these ideas since Quality of Work Life programs began to be adopted in the 1970s, encouraged by the original *Work in America* report and the social trends it documented. Complementary public-sector initiatives initiated in the late 1980s also supported strategies of skill upgrading and employee involvement. These included school-to-work programs that promised to create high-skill workers direct from high school, the Baldrige quality award that promoted Total Quality Management with some upgrading of skills and employee involvement, national voluntary skill standards in many industries and states that

were intended to lower the cost of hiring and acquiring high skills, the Manufacturing Extension Program that was supposed to upgrade skills, and many others.

Unfortunately, despite these efforts our knowledge of their effectiveness remains inadequate and many measures of U.S. job quality have not improved. Median earnings and job security remain disappointing and inequality is still elevated (Mishel, Bernstein and Allegretto, 2005). Manufacturing employment has continued to decline, even as many U.S.-based firms have prospered using overseas assemblers.

What remains unclear is whether the new workplace practices were ineffective or were never brought to scale. Measuring the extent of genuine employee involvement in the workplace in a nationally representative fashion remains difficult. Most of the supportive public sector initiatives were small, poorly funded, and never affected many students or workplaces. We also do not know what would have happened to American jobs if these efforts were not made; perhaps the situation would have been significantly worse. Thus, the question remains: Do we need *more* of the medicine (more training, more employee involvement) or *different* medicine?

American living standards are tied to the value of what we produce (net the value of negative externalities such as pollution). For working people, living standards are also tied to high employment rates and institutions that ensure the fruits of higher production are shared. Unfortunately, we have no quick answer to how to raise productivity, maintain employment, and increase wages. It seems clear that better data is needed if we are to understand whether recent efforts are on the right track. In the absence of more definitive answers we next propose ways to improve our understanding and discuss how this information might be leveraged to promote change.

Better measurement for researchers

Progress on understanding the effects of new work practices on both employers and employees is slow in part because we lack basic data. We do not even know the incidence of training or gainsharing, nor do we know how levels of employee involvement vary over time or sector. Understanding the effects of these policies remains even more remote.

While a number of nations have repeated workplace surveys, the United States has only a series of ad hoc surveys that do not use common definitions (e.g., Osterman 2000; Lawler et al. 2001; Freeman and Rogers 1999; Frazis, Gittleman, Horrigan, and Joyce 1998). While a few of these have been repeated, we still cannot even identify basic trends.

The United States needs a repeated survey of American workplaces. The ideal measure would have a longitudinal component (presumably with workplaces rotating in and out of the sample). To address measurement error, the survey would need two or more employees per workplace.

Better measurement for workers and employers

Because shreds of employee involvement are ubiquitous but serious implementations seem rare, the government may have a useful role to play -- although not just one of mandating how workplaces should be organized. The government's role could be simply to make it easier for employers, customers and investors to see which employees and suppliers are constantly solving problems. As researchers identify patterns of workplace practices that reliably predict better outcomes for workers and firms, the firms with observable best practices will find themselves rewarded in the marketplace.

This recommendation would provide coherence to the dozens of disjointed policies the government already has that affect the workplace, including accounting rules that fail to measure

training as an investment, skills standards that define problem-solving differently in different states or industries, and procurement policies that emphasize low bids over quality. The win-win approach of measuring who solves problems can foster the goals of government, business, and employees.

As noted above, many governmental policies in the last generation have attempted to make the nation's workplace-related policies more friendly to high-skill workplaces.

Nevertheless, much more can be done.

In the computer industry, the saying is, "Standards are wonderful, there are always so many to choose from." Certifying what our students and workforce have learned is becoming as complicated as computer industry standards. Currently the electronics and retail industries (among others) and a number of states are each creating separate standards that measure skills in problem solving and working in groups -- the key skills employers say they need. Thus, someone who has good skills at solving problems in one industry might receive no credit for these skills when he or she moves to another industry.

Our skill standards should be created from a common set of building blocks that measure these key skills. Standards for measuring how well students work together in groups and solve problems have the additional benefit of helping schools. Clear standards in these areas would help schools understand what they need to do in their move away from "chalk and talk" toward making education both more interesting and more relevant.

Companies face the same problem as employees when trying to certify the quality of their goods or services -- a profusion of standards and certifications. A company that hires workers who solve problems and that collects data from its customers to always improve its products and services is a good supplier. Nevertheless, it has to jump through different hoops to sell to a car

company than to sell to an airplane company -- and different hoops again to sell to different parts of the U.S. government.

The federal government must work with other large customers to create standard certifications that measure which companies produce high quality and are organized to improve their quality. The good news is that the federal government is already beginning to copy the private sector's best practice; specifically, the government is starting to rely on existing supplier certifications (e.g., those given by the automobile and computer industries) as one factor when choosing suppliers. This move should improve the quality and lower the lifetime cost of the goods and services bought by our government. Suppliers of high-quality goods and services tend to rely on their workers for help in improving quality. Thus, buying higher quality should not only save the government money but also increase the quality of U.S. jobs.

Investors face the same problem as customers: How do they know if the company is investing in building a high-quality reputation, or if it is depreciating its customers' and employees' good will? Unfortunately, current accounting rules do not measure the investment that managers make in building a high-quality workforce and in producing high-quality goods. Instead, in the short run, such spending shows up only as lower earnings.

The government should restructure its accounting rules to put investment in people and in quality on a more even footing with investment in plant, equipment or research. The government can work with industry and the accounting profession to create standard measures of workplace investments that are comparable across time and across companies. Only then can investors understand which companies are investing for the long term.

All of these efforts must be tied to careful evaluation. Jobs with high skills and high employee involvement involve continuous learning and improvement. We can ask no less of the policies that are supposed to support such jobs.

The bottom line is that American workplaces will continue to slowly expand their use of high-skill, high-involvement strategies – if only because low-skill jobs will increasingly be located overseas. At the same time, these shifts can be accelerated if government policies remove obstacles and address market imperfections. As importantly, workers will share more of the fruits of any gains if the government promotes the flow of information on the characteristics of workers and workplaces.

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Note: "*" indicates the source is used in Table 1.

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Table 1. Effects of Employee Involvement Practices on Wages

Point estimates	Negative effects ^a	Positive and insignificant effects		Positive and significant effects			Total
		>0-5 percent	≥6 percent	>0-5 percent	6-9 percent	≥10 percent	
A. Study type^b							
<i>Nationally representative samples</i>							
Percent	39.6	35.8	3.8	9.4	7.5	3.8	100
N	21	19	2	5	4	2	53
<i>Industry, firm, or establishment studies</i>							
Percent	14.7	32.3	5.9	26.5	8.8	11.8	100
N	5	11	2	9	3	4	34
<i>All</i>							
Percent	29.9	34.5	4.6	16.1	8.0	6.9	100
N	26	30	4	14	7	6	87
B. EI Measures^c				Percent of Studies			
Job rotation (n=4)	75.0	25.0					100
Quality circles (n=4)	25.0	25.0			50.0		100
TQM (n=4)		50.0		25.0	25.0		100
Teams (n=22)	27.2	36.4	9.1	9.1		18.2	100
Alternative pay (n=11)	27.3	45.4		9.1	18.2		100
EI Scales (n=9)	22.2	22.2	11.1	44.4			100

Note: Teams and alternative pay include all varieties of these practices; this pooling may account for some variation across results. Sources are marked “*” in the References.

a. Almost all negative effects were statistically insignificant.

b. In Panel A the Pearson $\chi^2(5) = 10.27$, $P = 0.068$, providing suggestive evidence that results from national and establishment studies differ. If the order of the columns is meaningful (which requires assuming that statistically significant estimates of 0-5 percentage point increase are “more” in some sense than insignificant estimates of over 6 percent)) it is appropriate to use an ordered test. Fisher’s exact test shows the rows differ at the 5 percent level.

c. In Panel B the Pearson $\chi^2(25) = 33.74$, $P = .011$ which cannot reject that the patterns of results of the 6 work practice are drawn from identical distributions. The sample size of studies in Panel B is larger than in Panel A because many studies provide estimates for multiple programs. [Is the sample size in B larger than A?]