

**Managing for The Future: 21<sup>st</sup> Century Skills and High School Educated Workers**  
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Two trends have significantly increased pressures for restructuring the United States labor market and dominated academic and policy discourse. Computers and information technologies have automated routine and rule-based tasks in many occupations, delegating tasks that were once performed by individuals to equipment and technology. And the global outsourcing of jobs that can be performed more cheaply outside the United States has accelerated the decline in manufacturing employment and the movement offshore of a range of service jobs. Partly as a result of computerization and globalization many scholars have suggested that the labor market is “hollowing out” (Levy and Murane, 2005): high-wage, high-skill occupations and low-wage, low-skill occupations are growing, while the middle-range occupations (those that paid self-sufficiency wages and required moderate skills) are shrinking as a share of total employment. This creates significant challenges for the fabric of American democracy as workers with high levels of formal education are rewarded in the labor market, while workers with a high school education are stuck in jobs that pay low wages. The resulting income disparity, based on formal education attainment, appears poised to continue to widen.

The reasons for increasing wage inequality in the U.S. are more complex, however, than the technology-plus-globalization story suggests. Some of the low-wage occupations with the largest numbers of job openings to 2012 are virtually untouched by

either. Child care workers, nursing assistants, hotel housekeepers, and retail clerks perform jobs that form the backbone of our economy and that are intrinsically as skilled and complex as many of the higher paid industrial jobs the economy is shedding. Yet these growing service occupations pay wages far below the earnings in the declining industrial jobs. Moreover, the relentless cost cutting via lower wages, denial of benefits, and intensification of work that are the dominant response to competitive pressures of firms that employ large numbers of high school educated workers is not inevitable. While workers with a high school degree or less can perform many of the occupations with the most opening for new entrants through 2012, the quality, complexity, and skills needed in those jobs depend on choices made by managers with respect to business strategy and work organization. Indeed work practices of some employers demonstrate that jobs can be developed that are more skilled and productive, and better rewarded. The question then becomes, how can workers be trained to perform these new jobs? We suggest that not only can jobs be organized in innovative ways but the public sector can take an active role in helping employers deliver the necessary training to workers to perform these jobs. Our research suggests that innovative use of computer and information technologies will allow for the democratization of education and skills training, reaching hourly workers in whom firms rarely invest and upgrading the skills of incumbent workers employed in low-paid jobs. To illustrate this, in this paper we answer four main research questions:

1. What are the jobs that are growing in the United States that require a high school degree or less?
2. What factors contribute to these jobs being organized as low-skill, low-wage work?

3. Using data from case studies, what are ways that employers can reshape these jobs so that they provide opportunities for workers?
4. What are ways to use technology to deliver training to the 42percent of U.S. workers with a high school degree or less?

### **Where are the Jobs in the 21<sup>st</sup> century?**

Much attention has been paid to the high-skill, high-wage jobs that are growing in the United States labor market. While we agree that professional and managerial occupations that require high level analytical, communication, and technological skills are growing, it is equally important to note that labor market projections indicate that within the service sector there will continue to be much opportunity for workers with a high school degree or less. As Figure 1 illustrates, occupations such as cashiers, retail salespersons, waiters and waitresses, food preparation and service workers, office clerks, laborers, and janitors/cleaners are all expected to have significant openings for new entrants through 2012. Indeed only three of the top ten occupations for new entrants require a college degree: registered nurses, post-secondary teachers, and general and operations managers. There are several reasons for the increased number of openings for new entrants: an expansion of service and sales occupations due to new technologies, an aging workforce, and high turnover rates in these service jobs.

<INSERT FIGURE 1 HERE>

Moreover comparing the number of job openings for service jobs with low formal education requirements to higher-skill, high-wage jobs demonstrates some surprising similarities. For example, while BLS estimates that there will be 832,000 job openings for financial services managers and professionals through 2012, there will also be 962,000 total job openings for healthcare support occupations (aides and assistants in nursing, psychiatric, home health, and occupational therapy). An even more startling comparison is that job openings for food preparation and serving related occupations exceed those for computer specialists, computer engineers, and computer systems analysts by more than two-thirds by 2012 (Hecker, 2004).

### **Jobs With Openings: Low-Technology and High Female Composition**

While it is clear that jobs that require a high school degree or less are growing, these jobs do share some characteristics that affect how the work is organized and compensated. First, for the most part, these jobs cannot be automated or off-shored. These are low-technology occupations that are situationally fixed and involve human interactions. That is, a waiter/waitress for a restaurant in New York City, cannot perform his/her work in Asia, nor can a computer serve a customer their dinner at the Tavern on the Green. Even more important, the human interaction component of the occupation is a significant employee demand skill. Service work involves a work arrangement in which the producer is, in fact, part of the product. As is linguistically illustrated, the server is selling service as much as, if not more than, a food product. Many researchers have noted that a portion of the work that service workers do involves creating social relationships within these interactions with customers or clients. As such, these jobs involve face to

face interactions that force workers to engage in emotional labor and caring labor. Emotional labor, a term coined by Arlie Russell Hochschild, refers to inducing or suppressing feelings in order to display a certain countenance in the workplace. In addition to emotional labor, many service occupations require caring labor: work that provides support to others (such as nursing, childcare providers, and teachers). Because these occupations require a “human touch” and must be performed locally, they are less vulnerable to the impacts of globalization. In addition, they require complex communication skills that cannot be automated.

The fact that these occupations necessitate emotional labor and caring labor also points to an important characteristic of these jobs. Often times the requirements involved in performing emotional labor and caring labor are not conceptualized as skills, but instead are seen as “natural”. This point becomes even more salient when we take into account the gendered nature of emotional labor and caring labor. Indeed, one of the main components of devaluing women’s work is the lack of value associated with caregiving, which is conceptualized as a “natural” aspect of being a woman, and not a skill that needs to be financially rewarded. Nancy Folbre (2001) has noted that women experience a “care penalty” for working in service sector, healthcare and other jobs that involve nurturance, caring, and other forms of support labor. Not surprising, when one examines the sex composition of these occupations, it is clear that women comprise a significant portion of this growing, low-wage workforce (see Table 1). Indeed in all of the growing service sector jobs, except for janitors and cleaners, and laborers and freight, women make up at least 50 percent of the workforce, with the majority of the occupations being predominately (more than 75 percent) female.

<INSERT TABLE 1 HERE>

The gendered composition of these jobs and, more importantly, the nature of the skills needed to perform the work contribute to their characterization as low-skill and low-wage. Indeed emotional work, caring, and relationship building is typically associated with women and mothering. The assumption follows that these jobs do not necessitate skill acquisition, complex communication, or expert knowledge, but instead rely on natural qualities of women. This reasoning then justifies the widely held view that workers should not be paid well for performing this work (England, Budig, and Folbe, 2002). The gendered nature of the growing occupations that employ high school educated workers complicates the overly simplified technology-and-globalization low wage story, and needs to be address explicitly by public policy – including an explicit recognition of the training required to develop appropriate knowledge and skills in child development, geriatrics, and health care occupations.

### **Employers' Business Strategy and Work Organization Choices: Implications for Job Complexity and Worker Skills in Frontline Jobs**

Employers' responses to economic pressures vary, even among firms in the same or similar industries, and differing employer responses lead to different outcomes for high school educated workers. Data from national surveys such as the CPS and Census offer valuable insights on a range of topics, but they provide very little information on decisions made managers or on changes in the tasks done by frontline workers and the skills required for particular jobs. To fill this gap, a set of case studies was carried out

under the aegis of the Russell Sage and Rockefeller Foundations' Future of Work Program. Twelve of those case studies, covering 464 establishments in 25 industries that employ large numbers of non-college educated workers, were published in the edited volume *Low Wage America*. The studies provide a deeper qualitative understanding of the decisions employers make.

Perhaps the most important insight from the research presented in *Low Wage America* is that while employers' responses to growing economic pressures have had a generally negative effect on frontline workers, especially those with no more than a high school degree, there are significant exceptions to this pattern. The dominant competitive focus in labor-intensive activities that consist of providing in-person services has been to reduce wages, cut benefits and increase workloads. Yet, some establishments that employ nursing assistants or hotel housekeepers have focused instead on raising worker productivity or increasing customer retention. When jobs consist of routine, repetitive, and predictable tasks, whether processing information or handling materials, technology can be used to replace frontline workers in these activities. But what happens to the tasks that cannot be automated? What kinds of jobs remain? The evidence gained from the case studies demonstrates that there is wide variation in employer responses to changes in technology and intensification of competition.

Employers' decisions along two dimensions – business strategy and work organization – play a key role in enabling some firms to avoid the myopic cost cutting that is rampant in the industries studied.

- Some hospitals have reorganized the work process and enhanced the jobs of nursing assistants and food service workers in order to improve

retention and reduce the costs of absenteeism and turnover. In New York City, where union density is very high, the union and the hospitals negotiated a significant increase in pay for nursing assistants that successfully completed a customized training program. This was cost-effective despite the higher earnings, since nursing assistants were then able to takeover some of the tasks of more highly paid RNs, freeing them up to perform higher skilled tasks and providing some relief for the nursing shortage.

- A similar strategy was adopted by some of the small and medium-sized manufacturing firms in central New York State. To achieve improved quality, greater variety, rapid turnaround on orders, and on-time delivery, some manufacturers have integrated tasks into more complex jobs and given workers greater responsibility for problem solving and other aspects of the production process.
- Firms can also compete by emphasizing product innovation and adopting human resource practices that support this business strategy. Team-based production processes, problem-solving and quality improvement teams, and increased communication with workers, managers and subject matter experts (mechanics, accountants, engineers, etc.) outside the work group are all important in enabling firms to meet customers' expectations. For example, some plastics firms compete on the basis of their ability and willingness to innovate with new products, and on their promise to deliver perfect quality products on time to their customers.

- The auto parts company that was studied has developed expertise in the design and manufacture of electronic and electromechanical systems that it uses to make innovative products with a moderately skilled, non-college educated workforce. It has developed a range of HR practices – compensation, just-in-time inventory reduction techniques – that support innovation.

Technological change has played at most a secondary role in these examples. But in some industries examined in the case studies in *Low Wage America*, technological change has had a significant impact on workers without a college degree. This was especially true in the case studies of industries such as financial services, call centers, and the manufacture of complex plastic products, medical devices, valves and steel.

- Information technologies have penetrated deeply into banking – not just ATMs that have taken over many of the high-volume, routine tasks performed by tellers, but check imaging and optical character recognition have effectively automated several key tasks in check processing departments. One interesting result found in the case study of the introduction of computer-based technological change in two departments of a major bank is that the reorganization of work processes in this bank *in advance* of the introduction of check imaging and recognition technology resulted in major improvements in productivity. The main point of this case study of the introduction of computer-based technology, however, is that managers have important discretion in how they organize the tasks that remain after technology has automated rule-based tasks. In one

department of the bank, the remaining tasks were fragmented and workers had narrow, repetitive jobs. In the other, the remaining tasks were integrated into more complex jobs that were both more interesting and more demanding, and that required greater skills.

- The case study of call centers also demonstrates the scope for variation in management practices. Business strategy has a large influence on management practices at call centers, with important consequences for the quality of jobs and job satisfaction among workers. While technology permits the fragmentation and deskilling of jobs, automates the distribution of incoming calls and shifts control of the pace of work to the technology, and facilitates electronic monitoring of employees, not all call centers operate under these onerous working conditions. Technological change creates incentives for firms to compete on the basis of product and service innovations. In this case, workers need more knowledge about complex products and about a product line that is constantly changing. More complex products and services also require that workers have more social interaction skills in order to interpret, persuade and negotiate with customers.
- In manufacturing, firms in some industries have survived in the U.S. by using technology to radically improve productivity or to enter a large number of niche markets. Computer-based technologies have resulted in continuous motion machines and robots that replace much human labor in assembly and packaging operations. The relatively small number of

production employees that remain in high technology, high volume plants work with many more pieces of equipment and check on equipment, do diagnostic, resetting and repair tasks, and respond to signals indicating equipment problems. In batch production settings, technology enables firms to produce a large number of technologically sophisticated products in the same assembly area. Employees still perform assembly jobs, but checking for product quality has become a more important component of the job and workers need to be able to adapt to frequent changes in the products they are assembling.

One common theme that runs across the case studies in *Low Wage America* is that computer skills per se have not created a bottle neck. Frontline workers in a wide array of jobs *do* require computer skills. However, modest amounts of training have generally been sufficient to impart the requisite computer skills. In some of the case studies, however, managers found that it has proven more difficult to teach abstract problem solving skills to incumbent workers. Some employers have turned to hiring workers with at least a few years of college education for jobs that, in principle, can be performed by a high school graduate to ensure that workers have the appropriate level of abstract reasoning and problem solving skills.

Thus, skill requirements for frontline jobs employing high school educated workers have usually, though not always, increased – but not always as a result of the introduction of new technology. In many jobs – nursing assistants in hospitals and nursing homes or child care workers, for example – it is the care of more acutely ill patients, higher expectations for teaching children, or the complex needs of a larger aging

population that leads to increasing complexity of the work. In jobs where the introduction of computer-based technologies has played an important role, the decisions of employers regarding business strategy and work organization may have a large influence on whether the tasks that computers can't automate are combined into low or high skill jobs.

In all of these cases, outcomes for workers without a college degree depend crucially on whether the employer provides training for incumbent workers. Yet U.S. employers typically provide little training for workers with a high school degree or less. One lesson of *Low Wage America* is that training can play a key role in enabling firms to pursue alternative competitive strategies that do not drive down wages and benefits for high school educated workers and do not displace, demean, or deskill workers without a college degree. But training of these workers is a path not often taken by U.S. employers.

### **Delivery of Skills Training**

If workers without a college degree need more education and skills training, and employers are reluctant to invest in skill development for these workers, how do we deliver that training to them? The workforce system faces significant obstacles with respect to how to deliver skills training to this group, as they face many barriers that prevent them from attaining skills training via traditional modes of delivery. Foremost, in light of the large numbers of women employed in low-wage jobs, childcare needs place a burden on workers employed in low-wage jobs, and in particular on single mothers, that often precludes them from attending traditional education programs (Edin and Lein, 1997; Johnson, 2002). Locating affordable childcare and “off hours” childcare (such as

on nights and weekends when many classes are offered) often proves to be a daunting task. In addition, a large percentage of the working poor are employed in jobs with irregular schedules, such as those characteristic of the service sector, making it difficult to attend classes that are inflexible in their scheduling. This is further complicated because most organizations that provide training typically are not open after traditional work hours or on weekends (Miller, Molina, Grossman, and Golanka, 2004).

In addition to childcare needs and irregular schedules, transportation also proves to be a significant barrier for many, making it difficult for them to attend classes. Nationally, one-third of households earning less than \$15,000 a year do not own a car (Van Horn and Schaffner, 2003). This is especially relevant in suburban and rural areas where there are not extensive public transportation systems. Furthermore, non-college educated workers often find very little access to employer-sponsored training. Lisa Lynch and Sandra Black (1995) found that employers' investment decisions in regard to employee training are influenced by the characteristics of the workers that they employ. Overall, they found that employees who are perceived as having a high turnover rate and/or possess lower levels of formal education are less likely to receive employer provided training. As such workers either forego training opportunities, or spend years attempting to complete credentials or degrees by taking one to two classes every few months.

Technology may be part of the problem contributing to the expansion of low-wage jobs, but it can also be part of the solution to upgrading worker skills and encouraging employers to organize work to take advantage of these skills to improve quality and/or productivity. One innovative approach to addressing the barriers of

attaining skills training is to provide the training via online learning. Online learning provides significant advantages to both the participants in the skills training program and their families that are not available in traditional settings. First, online learning offers flexibility in time and place. Participants can learn at their own pace, in their homes (or virtually anywhere), and attend classes when they can fit them into their schedules-taking classes at any hour or any day of the week. Further, online learning is cost effective, as participants save money and time in childcare and commuting when they receive skills training via technology in their homes.

While online learning may not be appropriate for everyone---it places a premium on discipline and self motivation---it has many advantages. In addition to flexibility in time and space, online skills training offers opportunities for literacy that reach beyond course content. Students are increasing their skills using the very tool – the computer- that is markedly affecting the type of skills needed for advancement in the labor market. Through online learning participants increase their facility with computers and the Internet, learn how to troubleshoot technology, and improve their typing skills. By bringing the computer into the home, these benefits extend beyond the workers themselves and also help to also increase family literacy. While access to computers and the Internet has increased over the past years, research continues to demonstrate that disparities across social class and educational level persist. According to the National Center for Education Statistics (2000) households with incomes of \$75,000 or more are twenty times more likely to have access to the Internet than families with less income. Further, while 63 percent of our nation’s classrooms are wired for Internet access, the digital divide continues to exist. In schools where 71 percent or more of children are

eligible for free or reduced price lunches, only 39 percent of classrooms are wired.

Alternatively, in schools where less than eleven percent of students qualify for subsidized lunches, 74 percent of classrooms are Internet ready (as quoted in Bae, et. al., 2000). As such, providing a computer in the home provides opportunities for children to increase their literacy.

In one very successful demonstration project, the New Jersey Department of Labor and Workforce Development used the Internet and computers to provide training to workers employed in low wage jobs. Participants in the demonstration project were single working mothers – recent welfare leavers already employed full time in low wage jobs. They each received a computer, Internet access, and courses for a year through their local One-Stop Center, along with job coaching and other support services. The training was very cost effective in comparison with community college or proprietary school training, and results of this program have been impressive. In terms of demographic and educational characteristics, participants were typical of the post-TANF population. Selection into the demonstration project was made by counselors at the One-Stops on the basis of an assessment of the individual's ability to find the time and space at home to fulfill the requirements of the program. There was a very high retention rate in the program, with only 11 of the 128 participants not completing the program. In addition, the participants in the program experienced an average wage increase of 14 percent in the year following enrollment in the training program, and 15 percent of the participants enrolled in other educational programs (such as community college and college programs) following completion of the training program. Perhaps most importantly, all the women emphatically reported that they would not have been able to complete their

training if it was not available in their homes and accessible at all hours of the day. This program has now been adopted quite widely in New Jersey and is offered as an option in 11 of the state's 17 Workforce Investment Board areas, serving a much larger number of workers.

Similar programs are now at some stage of implementation in another 10 states as states have begun to experiment with online training and, more broadly, the use of technology to deliver skills to workers without a college degree. They suggest that information technology can be used to increase access and bring down the cost of training the large numbers of workers without a college degree. Public-private partnerships to provide this training might also create a framework for business decisions that result in a more productive and better paid workforce.

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