Working Paper

Education, Families, and Workplace Policies: Their Roles in a Knowledge-Based Economy

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Introduction

Economists, politicians, and management writers all like to use the cliché that America is in the midst of transitioning from an industrial to a knowledge-based economy. The general argument is that for America to compete and maintain high standards of living in a global economy it needs a well educated, motivated, and innovative workforce that is employed in organizations that treat workers' knowledge and skills as assets and sources of competitive advantage rather than just as costs to be controlled.

Comparing families that got ahead to those that didn't in recent years demonstrates that this is more than a cliché. What is less well recognized, however, is how family structures and workplace policies interact with knowledge to shape who gets ahead. Figure 1 illustrates this point. Families that got ahead over the last two decades

Figure 1

Trends in the Real Median Income of Married Couple Families with Children Under 18 in the United States, by Educational Attainment of Both Spouses, 1979-1999 (1999 Dollars)

	1979	1999	Absolute Change	Relative Change
Median income by educational attainment of both spouses				
Both less than high school	$36,616	$30,000	-$6,616	-18.1%
Both high school graduates only	$51,597	$47,650	-$3,947	-7.6%
Both with some college	$56,634	$59,330	$2,696	4.8%
Both college graduates	$75,991	$96,000	$20,009	26.3%

Source: U.S. Bureau of the Census and Center for Labor Market Studies, Northeastern University.

were those with two highly educated working parents. Families where both the husband and wife had bachelor or higher degrees increased their family incomes by 26 percent between 1979 and 1999 while those with high school or less saw their family incomes decline. Three fourths of these increases in family income came from mothers who put more hours into the labor force. Today, two parent families with working parents are working the equivalent of two full time jobs—about 3,800 hours per year.

If it takes two well-educated working parents for families to get ahead in today's economy and if workforce knowledge and skills are key national economic assets, then family, education, and workplace policies need to be addressed in an integrated fashion, rather than as separate domains as they have been in the past. The need for an integrated approach is reinforced by two current realities. First education and learning can no longer be limited to one's early years prior to entering the labor force. Given changing technologies and markets, learning now has to be a life-long process. Second, the deficits now built into the federal budget will require new private sources of funding to cover much of the cost of life-long learning. In this essay I argue for a new approach that integrates education, workplace, and family policies in ways that reflect these realities and that calls for labor market institutions to take on a greater role in delivering life-long learning.

Given changing technologies and markets, learning now has to be a life-long process.

The Basics: Educating the Future Workforce

Let's start with the basics. There is no substitute for high quality education from the earliest years of child development and pre-school and beyond. But the "basics" needed in today's economy require changes in both pedagogy and subject matter. The education system of the 20th century was designed to socialize students to accept the discipline of command and control authority systems and the specialized division of labor that characterized the emerging organizations of the industrial economy. To fit the needs of organizations designed for a more networked, knowledge-based economy, today's educational system needs to produce graduates with strong science, math and technical knowledge *and* the ability to think and act creatively, to communicate and work together in teams, and to exercise voice and discretion to solve problems and resolve conflicts within and across organizational boundaries.

This type of innovative and high-quality education is accessible to most families able to afford living in communities with well funded public schools or who can afford to send their children to private pre-school programs, elementary and high schools. These are the same families that very likely have emphasized education and child development at home from early on in their children's lives. The problem is that this is not the reality for enough children and families today.

An example from Massachusetts makes the point. The cuts in federal funds and the decline in state revenues that followed the recession and the 2001 tax cuts caused Massachusetts to cut $500 million in state aid to local governments between 2000 and 2003. One study reports it would take $600 million to restore spending on education in the state to its pre-2000 levels. The impact of these cuts was brought home vividly last year to the children and families of Attelboro, Massachusetts, a working class-immigrant community in the southeastern part of the state. A day before the normal start of the school break for the Christmas-New Year's Holidays in 2003, the Attelboro school district closed its doors to conserve funds.[2] Attelboro gets 55 percent of its school district budget from state and federal funds. Its families do not have the discretionary incomes to supplement the budgets of its schools with voluntary contributions, fund raising auctions, and in kind contributions as is the norm in the more exclusive, high income suburbs of Boston such as Brookline, Newton, or Weston. Attelboro spent $6,679 per pupil in 2002 compared to between $10,000 to $12,000 per pupil in Brookline, Newton, Weston, and the other high income districts in the state. Failure to support the children of Attelboro ensures the gaps in income between families that have access to the best and the most education and those left behind will continue to plague the state and, since this pattern is replicated elsewhere, the nation.

Business leaders, both as citizens and self-interested employers, should be up in arms over both these cuts and in the disparity between the high and low income communities and school systems. Assuming the economy grows at even a moderate rate over the next decade, business will once again face shortages of scientists, engineers, and skilled technicians. The biggest pool of young people available to fill the growing demand for these skilled jobs are minorities, children of immigrants, and young women. All of these groups are underrepresented in the scientific and engineering professions.

[2] "Facing Budget Crisis, Town Closes Schools," *The Boston Channel*, December 23, 2003.

A recent study of this issue carried out by a group of business and academic leaders describes this problem as a "quiet crisis" for the American economy. They report that African Americans and Hispanics each comprise about 12 percent of the U.S. population but each group holds only 3 percent of science and engineering jobs in the economy. Women, who now comprise nearly half of the labor force, account for only 23 percent of all physical scientists and 10 percent of the country's engineers (BEST Report, 2004). These leaders challenged the business community to work in partnership with the full "educational supply chain" and with leaders of minority and women's organizations to reduce the inequality in school funding and to encourage and interest young women and minorities in science and technical careers. They see this as a business imperative and an obvious and necessary first step in building a knowledge-based economy.

Leveraging America's Colleges and Universities

The central message of the data in Figure 1 is that today the "basics" have to also include a college degree. In his January 2004 State of the Union address President Bush called for increasing the funding of community college job training programs by $250 million. The goal is to "prepare people for the 21st century workforce." This is a laudable objective. Labor market and educational experts generally agree that community colleges serve a critical role in the preparing the workforce for the future economy.

Putting $250 million into community colleges is a nice symbolic gesture. It allowed the President to give a rousing speech at Owens Community College in Toledo, Ohio in support of his initiative. But investing $250 million in 2004 will not even get the funding for community colleges much less overall spending on workforce training back to where it was in the 1990s. In 1999 the U.S. Department of Labor's Employment and Training Administration budget for training programs was $7.0 billion; in 2004 the President's budget request for training programs was $4.9 billion.[3] Ironically, the week before the President visited Owens Community College, six staff members lost their jobs because of funding cuts.[4]

Universities and community colleges and other educational institutions play an especially important role in helping families and communities adjust as we shift from an

[3] http://www.dol.gov.eta.
[4] CNN News Report Summary, January 21, 2004. http://www.cnn.com

industrial to a more service and knowledge-based economy. The percentage of the workforce employed in manufacturing has declined from 17 percent in the mid 1980s to about 14 percent in 2003. With each manufacturing job lost, some semi-skilled blue-collar worker and his or her family takes a significant drop in income, living standards, and long-term financial security in large part because the replacement jobs available to these workers in the service sector do not pay as much and have fewer health or retirement benefits.

Local educational institutions can help support community economic adjustment by providing training for displaced workers in the occupations of new industries, as illustrated by the role played by the Ben Franklin community college-university consortium in Allentown, Pennsylvania. By working together with business, labor, and community leaders, the Ben Franklin consortium of educational programs helped Allentown recover from the loss of its steel industry in the 1980s by creating over thirty new entrepreneurial firms and 5,000 new, good-paying jobs. By 2003 Allentown's unemployment rate was below the nation's average (Safford, 2004).

But inevitably, not all displaced workers or their communities will recover from the loss of good-paying manufacturing jobs. In this case the best adjustment policy is one that supports the *families* of these workers so that their basic health care and retirement security needs are met and their children have access to high-quality affordable colleges and universities so that they can get the education needed to go wherever job opportunities take them. This again illustrates the links among education, family, and employment policies.

Beyond the benefits they provide to individuals, universities and community colleges play a pivotal role in helping American industry stay on and push out the frontiers of science and technology and create the next generation products, entrepreneurial companies, and jobs. MIT boasts that over the past thirty years it has spawned creation of over 4,000 companies that in turn have created over one million jobs.[5] Many other progressive and innovative private and public universities can make similar claims. The University of Wisconsin prides itself in nurturing many of the bio-tech and medical instruments businesses growing up around Madison and for its reach to

[5] "MIT: The Impact of Innovation." http://web.mit.edu/newsoffice/founders.

industries across the state through its network of state university centers. The University of Texas has helped Austin to become a leading high tech center rivaling Silicon Valley and Boston. So have the public and private universities in the "research triangle" in the Raleigh-Durham, North Carolina region. Like many others, these universities put a high priority on linking their scientific and technological research to industry and to entrepreneurial networks. The hope is that out of these university laboratories and networks will emerge the future generation of Intels, Microsofts, Biogens, and Starbucks.

In the early 1990s, Congress authorized funds to support "Manufacturing Extension Centers" that built on the legacy of the highly successful Agricultural Extension programs of an earlier era. This same model could be used to create Science, Technology, and Learning Centers in various states or regions that encourage and support these types of university, industry, and workforce networks.

Life Long Learning: Education at Work

The American Society for Training and Development estimates that business spends something on the order of $200 billion or two percent of payroll annually on training and development (Carnevale, et al, 1990). This sounds like a lot of money. It is. The problem is that most of it goes to a small fraction of the labor force and much of the training (setting aside questions of quality) is focused on *specific training* i.e., training that is relevant to the work of the firm, as opposed to *general training* workers need to keep their skills current if they need to find a job in the external labor market.

We should not find this surprising. It has long been recognized that the American economy suffers from what the economics literature calls a *market failure* with respect to training (Porter, 1994; Kochan and Osterman, 1994). That is, there is less general training than what would be good for the overall economy because individual firms fear that others will not invest their fair share. No rational individual firm will want to pay the costs of general training while its competitors don't and instead lure those trained by others to come and work for them! This problem will persist as long as training investment decisions are made by individual firms.

There are two ways to overcome this type of market failure. One would be to fund education and training on a collective industry or society basis, as we do with public

education. But as noted above, public funds for training have declined in recent years. In the world of constrained budgets and large deficits we are now in, we are not likely to see the federal government reallocate resources or raise taxes targeted to life long learning at anything close to the levels needed, regardless of who is in the White House or Congress.

If working families can't expect individual employers or the federal government to provide life long learning, what are they to do?

If working families can't expect individual employers or the federal government to provide life long learning, what are they to do? The answer has to be to make continued learning a priority on their own negotiating and decision-making agendas and to build the institutions that will see it as in their organizational interests to supply life long learning opportunities.

A number of models already exist for doing so. Various professions require a certain number of hours of education and training to retain one's certification. Nurses, lawyers, civil engineers, and many other professionals lose their "licenses" unless they meet the minimum hours of continuing education. Some of this continuing education is provided directly by their professional associations and some is provided by a variety of other private sector vendors, conference organizations, and universities. The key is that the profession itself requires all members to participate and therefore a market develops to meet the demand. And, many employers pay part or all of the costs of this on-going professional development in order to recruit and retain these professionals. This is a promising model for solving the market failure problem. It is also a prominent role for unions and professional associations could play in the future. These are the types of labor market institutions needed to support a knowledge-based economy.

Another promising model is the joint union-management training programs that are funded through hourly contributions negotiated in collective bargaining. These are found in parts of the unionized auto, bakery, construction, aerospace, telecommunications, and health care industries. The joint fund at the Boeing Corporation, for example, supports both employed and laid off workers who can take courses such as computer science or small business management, as well ones directly relevant to aerospace technologies and skills (Barrett and Long, 2004). Because these joint programs are funded through payroll deductions, employees and their representatives

share control over the mix of general and specific training they provide. This both helps overcome the reluctance of an employer acting alone to fund general training and it provides a steady source of funding that cannot be cut unilaterally by an employer when budgets get tight. One way to spread these types of joint funds to larger numbers would be for the federal government to provide a tax credit to firms and employees that make these investments.

Even in the absence of collective bargaining, a variety of tax incentives could be devised to encourage the build up and use of life long learning funds. Individual learning accounts funded with pretax payroll deductions could be vested so individuals don't lose them if they leave an employer. Employees might, for example, use their learning accounts to finance the cost of further education or refresher courses while employed or when moving between jobs. If these accounts could be used to invest in education for one's family members, women (and men) could use them to update their skills after taking time off to attend to child or elder care responsibilities or to cover college tuitions for their children. The key to all these models is that workers themselves and/or their professional associations and unions take the initiative to create on-going learning opportunities and have a voice in program design and delivery.

Building Knowledge Based Workplaces and Corporations

Suppose American young people, parents, and citizens do their part and provide the business community and economy with the knowledge and skills needed. Can workers be assured their knowledge and skills will be translated into good sustainable jobs and careers in the organizations of the future? Not necessarily. It all depends on the outcome of a largely invisible and often only implicit debate underway within American corporations. The battle is over whether or not companies will make the transition from industrial era, finance dominated, command and control, and shareholder maximizing corporations of the 20th century to knowledge based and human capital centered corporations of the 21st century. What will this require of organizations? We have learned a great deal about what it takes to build and sustain knowledge based work systems and organizations in recent years. The Alfred P. Sloan Foundation has supported studies of the effects of workplace practices on firm performance in a broad cross-section of industries ranging from autos, steel, semiconductors, computers, and others in

manufacturing to service industries such as airlines, telecommunications, construction, and financial services (Cohen, 1998). The evidence from these studies is remarkably consistent. High levels of productivity and service quality are associated with employment practices that achieve and sustain investment in training and development, employee participation in problem solving, teamwork and flexibility in work organization, and more cooperative labor-management relations (Ichniowski, et al, 1995). These attributes combine into what is now commonly referred to as "knowledge-based" or "high performance" work systems (Cutcher-Gershenfeld et al, 1998; Pfeffer, 1998).

The problem is that diffusion of knowledge based work systems is only partial and slow. The best estimates are that perhaps one third of American workplaces have adopted these knowledge based work system principles (Osterman, 2001). The majority of workplaces continue relying on more specialized task structures and divisions of labor, more top down supervision and control, and more low-trust adversarial labor-management relations.

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Introducing and sustaining support for knowledge based work systems requires a high level of trust between employees and management. This has proven hard to do in the context of the layoffs, restructurings, corporate scandals, and threats of outsourcing and off-shoring work that has occurred in recent years. There is, however, growing acceptance of the view among CEOs, policy makers, and other leaders that corporations need to find ways to restore and sustain a higher level of trust with the workforce (Fiorina, 2003). The question is how to do so. This gets right to the heart of workplace policies governing employee voice. It has long been recognized that America's labor policies are outmoded, ineffective, and perpetuate the adversarial worker-management relations of the industrial era for which they were designed (Commission on the Future of Worker Management Relations, 1994). But a twenty-five year business-labor deadlock persists over how to reform and modernize labor law. Breaking this impasse will require a new approach that promotes high trust relationships at work, supports diffusion of knowledge based work systems and organizational policies, and provides employees the independent voice they need to safeguard their human capital investments. I suggest, therefore, a simple new principle: *Employees who invest and put at risk their human capital should have the same rights to information and voice in corporate governance as*

do investors who put at risk their financial capital! Doing so would not only help bring about the independence corporate government reformers are calling for, it would also safeguard employees' human capital investments and support the diffusion of knowledge based work systems.

Family and Work Policies

If mothers served as the safety valve both for the American economy and for family income in the past two decades, that reserve labor force is now is just about exhausted (literally and figuratively). Maintaining this level of effort will require America to finally confront the need to reexamine its work and employment policies to provide workers with the flexibility and income supports needed to meet their dual work and family/community responsibilities. As the hours family units devote to paid work increase, so too does the need for flexibility in hours, days, and work schedules to attend to child care or elder care needs, to work part-time, or to take time to refresh or upgrade skills. Today this type of flexibility is largely available only to employees in the upper half of the income and occupational distribution (Heyman, 2000). At some point soon, America will need to join nearly all other industrialized countries and adopt a paid family leave policy that complements and dovetails what leading employers already provide to their higher level employees. Until this is done, significant portions of the investments individuals and society make in education will remain underutilized at a cost to both the economy and to family incomes.

Once we begin addressing the educational needs of a modern knowledge-based economy we quickly see interconnections with a host of other workplace, economic, and social policies that likewise need attention. Addressing these and related workplace issues will need to feature high on the agenda of the policy makers and leaders of private sector institutions for years to come.

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