

A White Paper

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The Future of The Northeast Ohio Workforce



NORTHEAST OHIO
COUNCIL ON
HIGHER EDUCATION

A Product of the Northeast Ohio Regional Workforce Initiative
A Partnership of the Northeast Ohio Research Consortium
and The Northeast Ohio Council on Higher Education

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PURPOSE

The purpose of this paper is to stimulate thought and discussion among members of the Economic Growth Working Group on the macro issues surrounding the future of the workforce in Northeast Ohio. The paper is based on a review and analysis of the literature on the future of the workforce, including relatively concrete economic and empirical research as well as more subjective visionary literature.

EXECUTIVE SUMMARY

Introduction

The world economy is in the midst of changes which have tremendous implications for the nature of work and workforce development in the Northeast Ohio region.

Macro Issues

- Globalization and intensifying competition, new work organizations, and rapid technological change all combine to require new basic competencies on the part of the workforce.
- High performance work organizations involve elements such as cross-training, job sharing, flatter institutional structures, contingent compensation, team-based work and telecommuting. These work systems are expected to be increasingly adopted in workplaces of all types, but will be adopted at different speeds and to varying degrees by firms and industries, and therefore, by geographical region.
- As information technology advances and is adopted universally, an era of 'information parity' may be reached, in which existing barriers to accessing information will be virtually eliminated. Across industries and organizations, workers who coordinate and move information will be needed to a lesser extent, and the competitive advantage on the part of large firms of low intra-firm costs will be eroded as the cost of inter-firm communication quickly declines. For some industries, this may result in substantial upheaval.
- Skill requirements have increased over the past decade, and will continue to do so, both within and across occupations. Skills upgrading and higher demand for skilled labor is expected, while lower-skilled workers and those with 'outdated' skills may be displaced. Cognitive and interpersonal skills will become more critical.
- These trends imply the need for increased collaboration between industry and institutions of higher education, that is, systems of education and training in which industry is enrolled as a partner in the development of curriculum and standards of excellence. This would facilitate a transition from solely degree-based credentials to standards and certification-based credentials.
- Higher education is expected to undergo the kind of reorganization that is ongoing in industry, a transformation from the traditional structure of hierarchical authority to one with flatter, team-based management and other elements of innovative work systems. Greater mission differentiation on the part of institutions of higher education is also warranted in order to satisfy the needs of a growing number of different constituencies with changing and varied needs.

Conclusion

Globalization and heightened competition set the stage for the reorganization of work, hastened by ongoing advancements in technology. The implications for skills needed by the NEO workforce are complex. The demand for higher-skilled labor will rise, but the mix is unknown. The demand for lower-skilled labor in the future is less certain, but skill needs at all levels will definitely rise. The future workforce will need not only improved technical skills, but a range of cognitive and behavioral skills as well. The optimal composition of skills for the NEO workforce depends fundamentally on the characteristics of the region: the industry and firm mix, the orientation and scope of the region's markets, and the rate of implementation of new technology and work reorganization. To anticipate the needs of industry, partnership and communication between industry, regional policy-makers and educational institutions are critical. If the system of higher education is to reorganize and improve within this context, the involvement of industry will be invaluable for direction and support.

Introduction

The world economy is in the beginning stages of a shift from the Industrial Era to the Knowledge Era, and this shift may have tremendous implications for the nature of work and workforce development in the Northeast Ohio region. Globalization and intensifying competition, new work organizations, and rapid technological change all combine to require new basic competencies on the part of the workforce. Skill requirements have increased over the past decade, and will continue to do so, both within and across occupations. In 1983, 31% of all jobs required post-secondary education, while more than half of the jobs created between 1984 and 2005 will require some education beyond high school.¹ Cognitive and interpersonal trends are becoming critically important relative to motor skills, and this trend will intensify into the next century. Not only are the skill needs of the workplace changing, but the relationship between employers and employees is transforming as well. If the NEO workforce is to improve and succeed in the future, the region's educational and training institutions and industry itself must anticipate and respond appropriately to the challenges created by this transition.

Importantly, the future of the workforce must be considered against the backdrop of the globalization of the economy. The role of the U.S. economy in the world market has changed substantially over the postwar era. At the end of World War II, U.S. production accounted for about 40% of the total world output; the U.S. economy now accounts for about 25%.² New foreign markets such as China are emerging as significant players in the world economy, and many of these countries are experiencing far faster economic growth than the U.S. Barriers to international trade continue to drop and regional trading blocs have been formed; such blocs are considered an interim step before trade barriers are lifted altogether. This implies intensified competition for firms as the geographic boundaries of markets continue to widen. The rapid pace of advancement in telecommunications technology will only magnify this trend.

I. The Reorganization of Work

¹ Bassi, L., G. Benson, and S. Cheney. "The Top Ten Trends." Training & Development. November 1996, pp. 28-42.

² Voytek, K.P., Ed. "Globalization: Friend or Foe." Workforce Economics. Publication of the National Alliance of Business. June 1997. pp. 8-11.

Spurred in part by an intensified competitive environment, industry is engaging in a considerable amount of restructuring. In the first half of the 1990s, much of this restructuring involved 'downsizing', that is, a renewed focus on 'core competencies' and the outsourcing of other needs of the firm, while reducing the permanent workforce. Evidence suggests that while the downsizing trend has slowed, it is ongoing. However, a new trend towards 'insourcing' and 'high performance work systems' (HPWS) has begun. The focus of work reorganization has turned towards employability and investment in labor; it is becoming widely believed that a firm's workforce, and the human capital it embodies, is one of the most important sources of its competitive advantage. Therefore, much of the future transformation of the workplace will surround the role of workers and the nature of work itself.

HPWS entail the organization of work to allow for a substantial degree of *flexibility* on the part of both management and workers. Evidence has shown that flexible forms of work organization, when combined with innovative human resources management and linked to corporate strategy, result in improved productivity and quality of work. HPWS is effectively a catch-all phrase to describe innovative work systems involving one or more of the following elements.

- Flexible work hours
- Cross-training
- Overlapping job design
- Job rotation and job sharing
- Flatter institutional structures
- Contingent compensation
- Customized training programs
- Telecommuting
- Multi-skilling
- Team-based work
- Information-sharing
- Employee ownership
- Decentralized decision-making
- Performance-based job security

These elements are expected to be increasingly adopted in workplaces of all types, across organizations and industries. For example, continuing innovation in communications technology will enable the dispersion of the workforce through telecommuting. The number of telecommuters is expected to triple from an estimated 9 million workers to 27 million by the year 2010.³ For another example, employee participation in the general form of team-based work has

³ Piskurich, G.M. "Making Telecommuting Work." Training & Development Journal. Vol. 50, No. 2. February 1, 1996. pp. 20-27.

become increasingly popular, and should be widely adopted over the next decade. Between 1990 and 1993, the percentage of Fortune 1000 corporations with employee-participation groups increased from 70 to 80%, while the proportion with self-managed teams increased from 47% to 68%.⁴ The nature of team-based work is expected to become more sophisticated, with teams accepting more responsibility and perhaps having compensation tied to team performance.

HPWS suggest a new role for workers in which they will assume a much greater degree of responsibility for the outcomes of their work, and the performance of their teams and firms as a whole. Such a substantial degree of employee participation requires what some term a 'new employment compact' between workers and firms; one which calls for greater responsibility on the part of employees, but ensures trust and collaboration through job security, perhaps contingent on performance.⁵ The role of managers will change as well, as they become overseers of processes and flows of activity, rather than of tasks and people.

Which Firms/Industries in NEO will Implement HPWS and How Quickly?

Flexible work systems will be adopted at different speeds and to varying degrees by firms and industries, and therefore, by geographical region. The nature of the product market appears to be the primary determinant of the implementation of HPWS. For firms which supply relatively new, unsaturated mass markets, flexible, decentralized structures may not be optimal or even possible. Evidence also indicates that HPWS are less likely to be implemented in small and medium-sized firms, since their development requires high substantial fixed costs. Generally, HPWS are more likely to develop in firms and industries where:⁶

- The product market has international competition.
- The organization is large.
- Overall skill levels and use of advanced technology are high.
- Organizational values are worker-oriented.
- Focus is on service and quality versus cost.

⁴ Bassi et al.

⁵ Bohl, D.L., F. Luthans, J.W. Slocum, Jr. and R.M. Hodgetts. "Ideas that Will Shape the Future of Management Practice." *Organizational Dynamics*. Summer 1996. pp. 7-13.

⁶ Whitfield, K. and M. Poole. "Organizing Employment for High Performance: Theories, Evidence and Policy." *Organization Studies*. 1997. No. 18. Vol. 5. pp. 745-764.

- Contingency or incentive pay schemes are present.

Because the Northeast Ohio region is more unionized than some of its competing regions, the issue of unionization and its effect on the rate of implementation and success of HPWS becomes important. Although the general perception is that unions would constrain management in implementing HPWS, the evidence shows the opposite; the presence of a union has been shown to support rather than inhibit the introduction of HPWS. Further, the financial performance of firms with HPWS and unionized workforces have been found to be stronger than those with HPWS and non-union labor.⁷

The presence of unionization may partly determine the specific elements of HPWS, however. HPWS have been implemented within two general organizational strategies: ‘team production’ and ‘lean production.’ Under team production, authority is relatively decentralized and workers are represented in decision-making at all levels, while under lean production, authority remains centralized, and employee representation in decision-making involves only selected workers on problem-solving committees under the direction of managers. Best practices of HPWS under team production have been found in unionized workplaces, while best practices under lean production have been found in non-unionized workplaces.⁸

It is also true that different elements of HPWS will be adopted by different functional divisions/firms/industries to the extent that they are appropriate. For example, telecommuting is expected to be implemented widely in customer service and call center functions; these functions by their nature will be easily decentralized to a number of sites local to workers and to the home. Telecommuting is less likely to be implemented in manufacturing operations, where team-based organization and job rotation on the floor are more appropriate elements of HPWS. Moreover, organizations with older, more experienced and skilled workforces may find that telecommuting is more suitable than organizations with relatively inexperienced and less-skilled labor.

II. The Pace of Technological Change

⁷ Ibid.

⁸ Id.

The rapid pace of technological innovation holds perhaps the most significant implications for the future of the workforce. Into the next century, computer, Internet and telecommunications technology will combine, revolutionizing communication by allowing global interconnectivity across all types of information media. A host of ‘smart’ consumer and commercial products will become standard, and may revolutionize the processes for which they are used. Examples include personal digital assistants, virtual reality, flat panel displays, voice recognition lock systems, digital video discs, and embedded self-diagnostic systems.

This ongoing innovation in information technology (IT) is expected to change the nature of work and life in even more dramatic ways than have technological advancements of the past, such as steam power and electricity. IT differs from past technological advancements because it has applications in all industries, and all functions within firms, is both an input and a final product, and because it makes fewer claims on the environment and other resources. Further, the cost of IT has fallen dramatically over a short period of time in which its productive capabilities have skyrocketed.⁹ For these reasons, IT will be widely and quickly implemented in the economy and larger society as well. In particular, technologies such as the Internet and Intranets, already in use in most workplaces, will become more frequently and widely-used for an increasing number of applications.

Over the next decade, advances in the use of computer and telecommunications technology are expected in all workplaces and all industries. The share of information technology of firms’ total investment in equipment increased from 7% in 1970 to 40% in 1996, and is expected to grow even more rapidly in the future.¹⁰ In 1996, it was estimated that 65% of U.S. workers used some form of information technology in the workplace; by the year 2000, the proportion is expected to increase to 95%.¹¹

⁹ “A Survey of the World Economy: The Hitchhiker’s Guide to Cybernomics.” *The Economist*. September 28, 1996.

¹⁰ *Ibid.*

¹¹ Jones, R.T. “The Challenge of World Class Training.” *Vital Speeches of the Day*. December 1996, pp.115-121.

Implications

As information technology advances and is adopted universally, an era of ‘information parity’ may be reached, in which existing barriers to accessing information will be virtually eliminated and the bulk of information is no longer proprietary.¹² Across industries and organizations, workers who coordinate and move information will be needed to a lesser extent. For example, the automation of office tasks is expected to reduce the number of clerical workers by 30-40% within the next two decades.¹³ In all functions, there will be a shift in focus from the gathering and collecting of information to the analysis and selection of pertinent data from the information at hand.

Ubiquitous information means that the competitive advantage on the part of large firms of low intra-firm costs will be eroded as the cost of inter-firm communication quickly declines.¹⁴ IT will enable direct access to customers and suppliers, potentially changing the nature of backward and forward linkages in all industries and organizations. As customers deal directly with suppliers via technology, the need for intermediaries, both firms and workers, may diminish. In industries in which the access and distribution of information has heretofore been costly and proprietary, small and medium-sized organizations will be able to compete more easily. For some industries, this may result in substantial upheaval.

To date, much of the impact of IT on industry has been in the form of changes in operating processes. As information parity is reached, businesses that are built on the competitive advantage of proprietary information may be forced to undergo dramatic changes in structure. When universal technical standards for communication emerge, information will be free from the channels through which it currently travels, making those channels obsolete. For example, traditional physical distribution channels may no longer be economically viable, since there will no longer be lower transactions costs associated with economies of scale in distribution. Industries that are certain to be affected in this way include financial services, real estate, auto

¹² Li, R. “The Future of Employment – Workplace of the Future.” Essay for the International Management Symposium. Bertelsmann, McKinsey & Co., and ISC. May 1996.

¹³ Halal, W.E. “The Rise of the Knowledge Entrepreneur.” *The Futurist*. Vol. 30, No. 6. November 1, 1996. pp. 13-16.

dealerships, and retail trade, all industries in which competitive advantage has heretofore been built on the fact that the businesses possess better information than their customers and competitors.

Finally, some envision the future economy to be composed of ‘virtual organizations’ in which electronic technology is used “to link workers and functions at scattered sites.”¹⁵ Work will be spread across geographically distributed teams; workers will then communicate face-to-face with distributed team members, but electronically with managers, the rest of the organization, suppliers, customers, and so on. Rapid innovations in digital, video, audio and text-based communication, the implementation of global communication networks, and the growth of telecommuting will enable the development and high performance of such virtual organizations.

III. The Skill Composition of the Workforce

It seems obvious that the workforce of the future will need greater and different skills in order to work in the context of a global, connected and flexible economy. In general, it is to be expected that the composition of skills as well as occupations in the future will be different than it is today.

Skills Upgrading and Deskilling

There is evidence that the implementation of advanced technology in the workplace will have a dual impact on the composition of skills in the workforce. On the one hand, the use of advanced IT should lead to skills upgrading; since technology and skilled labor are complements in production, as firms expand the use of advanced technology, the demand for skilled labor should increase. This may mean not only an absolute increase in the demand for skilled workers, but given the speed of technological innovation, a ramp-up of skill levels needed within occupations as well.

¹⁴ Winter, S.J. and S.L. Taylor. “The Role of IT in the Transformation of Work: A Comparison of Post-industrial, Industrial and Proto-industrial Organization.” *Information Systems Research*. Vol. 7. No. 1. March 1996. pp. 5-21.

¹⁵ Barner, R. “The New Millenium Workplace: Seven Changes That Will Challenge Managers – and Workers.” *IEEE Engineering Management Review*. Vol. 25. No. 3. Fall 1997. pp. 114-118.

At the same time, the use of advanced technology may displace lower-skilled workers, and those with 'outdated' skills and possibly certain occupations. Middle-level managers may be at risk for displacement in this environment, since the use of IT will reduce the need for intermediaries in the workplace. In fact, ubiquitous information may limit the need for all workers who serve intermediary roles. For example, products with embedded self-diagnostics may serve to eliminate jobs in customer service and repair. Older workers are also at greater risk, since their skill sets are more likely to be outdated. The rate of the displacement of these types of workers will depend on the industry mix of the region and the extent and pace at which older technology and work processes are replaced with advanced technology and HPWS.

The Contingent Workforce

As downsizing continues, there will be an expanding reliance on the contingent workforce; a third of the workforce was considered to be temporary or contingent in 1994, and this proportion is expected to reach 50% by the year 2000.¹⁶ The contingent workforce is increasingly composed of two groups: those who are contingent by choice, possess superior skills, and act as 'knowledge entrepreneurs,' and those who possess relatively low or outdated skills, some of whom would rather have permanent employment but have been displaced through downsizing. Workers in the contingent workforce are less likely to have benefits, more likely to experience spells of unemployment, less likely to be covered under labor laws, and less likely to receive training by firms.

The issues generated by the contingent workforce are amplified by the fact that firms are not only using more temporary workers, that is, workers who are employed by temporary agencies, but also because the relationship between firms and the workers they employ directly is becoming less permanent and more flexible. As this happens, a greater proportion of the total workforce may become contingent. The typical terms of employment in the future are likely to involve temporary contractual arrangements to provide services for a defined period of time, rather than traditional long-term employment relationships in large organizations.¹⁷

¹⁶ Halal.

¹⁷ Winter and Taylor.

In some industries such as the software industry, the terms of employment are loose, with employees working under project-related contracts with incentive-based compensation, moving from firm to firm easily. Workers view themselves as employees of the larger industry, rather than as tied to one firm. The software industry is perhaps a model for the nature of careers of the future, although the model may not be suited for the majority of industries.¹⁸ Characteristics that allow the extreme amount of contingency to work in the software industry include strong external and internal support for education and continuous learning, which provide workers with a portfolio of skills and transferable knowledge. Companies within the industry are densely networked, allowing workers to be visible to a number of firms, thereby facilitating information channels regarding employment opportunities. The industry has relatively low fixed assets, and a high proportion of total assets is accounted for by human capital, that is, highly skilled labor. Lastly, the software industry is still in an entrepreneurial stage, with relatively small companies and low barriers to entry. It is questionable whether the same career model will hold as the industry matures, or if it is applicable widely to other more mature industries.

Skills Required for Workplaces with Advanced IT and Flexible Work Systems

A direct consequence of the explosion of IT in the workplace is that the definition of ‘basic skills’ required for employability will be broadened to include computer literacy. For the region, this definition will be defined by the organizational and industrial mix.

Importantly, as industry implements advanced technology, and the pace of IT innovation continues, there will be shorter product cycles and therefore, shorter periods of time between changes in core technologies of jobs, meaning that knowledge and human capital may become obsolete more quickly. Since skills are developed relatively slowly, this reinforces the need for continuous skills upgrading at all levels of the workforce; continuous upgrading of technological skills will be required to match the pace of innovation. Moreover, specific knowledge may become obsolete quickly with innovation in IT, so the emphasis should be on learning skills such as flexibility and adaptability, rather than on specific techniques.

¹⁸ Kanter, R.M. “Nice Work if You Can Get It: The Software Industry as a Model for Tomorrow’s Jobs.” The American Prospect. No. 23. Fall 1995. pp. 52-59.

Across industries, high performance work organizations will need managers and workers who possess a portfolio of skills that are based more on conceptual analysis than is currently the case. Advanced technical skills, conceptual problem-solving skills, flexibility and adaptability, and even enhanced 'soft skills' such as motivation, reliability, and communication will become baseline, and will all be necessary in order to simply deal with the information overload created by innovations in IT. Team-based production, job sharing, overlapping job design, job rotation and the like all imply the need for multi-skilling and cross-training. For a telecommuting workforce in particular, skills needed will include not only technological competence, but also the ability to work independently and reliably, self-motivation and self-management skills, and flexibility.

Implications

One important consequence of a dual pattern of skills upgrading and deskilling may be a compression of the broad spectrum of skills across the workforce into two polar groups, high-skilled and less-skilled workers. The continued growth in service sector jobs reinforces this trend, since the distribution of skills in services is highly polarized. If there is increased demand for skilled labor and decreased demand for lower-skilled labor in the region, the income gap may widen between the high-skilled and less-skilled groups of the workforce, and also between permanent workers and those who are involuntarily contingent.

At the same time, problems of worker recruitment and retention may be amplified, since workers' skills will not match the needs of firms consistently and continuously. At lower skill levels, workers who are displaced due to IT are at risk: if not retrained, they will either drop out of the labor force, join the contingent workforce, and/or find jobs at lower skill levels. Research indicates that older workers are likely to account for a disproportionate number of displaced workers; this is particularly important in the NEO region with its relatively old workforce. If the worker-employer relationship moves in general towards the software industry model, workers will have looser attachments to organization and more frequent stints between jobs, both voluntary and involuntary. In this environment, workers must to be able to present a portfolio of core skills that cut across organizations and even industries.

Finally, changes in the technology of the workplace must be accompanied by changes in the work processes of those who use the technology; this may require substantially higher investments in the training of human capital. Given the changes in work organization and the pace of technological innovation, the cost of training an average employee is expected to rise from \$5,000-7,500 in the mid-1990s to \$20,000 by the year 2000.¹⁹ More ‘soft skills’ training may be necessary under HPWS so that workers are flexible and adaptable. Importantly, this type of training will generate positive externalities since these are general skills that cut across occupations. Therefore, private firms are likely to provide less training than is socially optimal, leaving a need for policy to defray costs or provide additional training directly. Moreover, training is less likely to be provided to older workers. As the region’s workforce continues to age, this could become a critical issue.

Consequences for the Northeast Ohio Region

A critical question concerns to what extent these changes will take place, and what they imply, for the NEO region. The coming changes in the skill mix of the workforce must be considered in the context of the region, that is, the regional industry and firm mix, the orientation and scope of the region’s markets, the rate of implementation of new technology and HPWS. The NEO industry mix as it relates to technological change and skill needs will fundamentally determine the future composition of the workforce, and the region’s ability to prepare its workforce for the future.

IV. The Skilled Labor Shortage

There is substantial concern on the part of industry and policymakers that NEO faces a shortage of skilled labor that is sure to worsen into the future.

The Demand for High-Skilled Labor

Given the above trends, it is apparent that the demand for high-skilled labor will grow over the coming decades, and that the demand for low-skilled labor may decline. Critical questions remain as to the amount by which the demand for higher skilled labor will increase in the NEO region, for what types of higher skills, and in which industries and occupations.

¹⁹ Maturi, R.J. “The Workforce Lure.” Industry Week. May 18, 1994.

The Demand for Low-Skilled Labor

According to the deskilling hypothesis above, the demand for low-skilled labor is expected to decline in the coming years. The wages of low-skilled labor have been declining since the 1980s, and this pattern has been interpreted to mean that the demand for low-skilled labor has fallen, and will continue to do so. However, there is evidence that the decline in the wages of the low-skilled workforce has resulted from industry restructuring toward lower wages rather than from lower absolute demand for relatively low skills. In fact, wages of lower-skilled labor have declined while the demand for skills *within* these occupations have increased.

This brings up a general difficulty in the measurement of the changing demand for skills. The change in demand due to changes in the composition of the workforce must be distinguished from the change in demand due to changes in the skill levels within occupations. It appears that the expected upskilling of the workforce will result not so much from the former, that is, an absolute shift to higher skilled occupations and an absolute decrease in the demand for lower skilled labor, but from the latter. In other words, much of the increased demand for skills will be *within* occupations.

Industry will apparently still have strong demand for *relatively* low-skilled labor and this demand will continue into the future. What is significant is that the absolute level of skills at the low-skill level, and at all skill levels, will be higher. In other words, there has been upskilling within occupations; the composition of the demand for labor of various levels has not changed, but the necessary skills within those levels have ramped up. Upskilling within occupations implies that higher skills will be needed in all occupations, from traditionally low-skilled occupations to all levels of the hierarchy. This is a critical point because it illustrates that the need for continuous learning and the higher-order skills considered above with the requisite changes in training and education, will cut across skill levels and occupations.

Therefore, the future demand for lower skilled labor in the NEO region is not a given, and questions remain as to which types of skills will be needed, and in which industries and

occupations. Again, these questions must be considered within the context of the NEO industry mix as it relates to technological, organizational and structural change.

The Skills Shortage in NEO

The questions of which types of skills are lacking in the region and which skills should be the focus in preparing the NEO workforce are complicated by the fact that the reasons for and makeup of the skills gap are not transparent. Furthermore, needs are certain to differ substantially across firms and industries. At higher skill levels, the shortages seem fairly easy to discern. For instance, it is apparent that NEO faces an increasing shortage of electronics and computer engineers. There is also an oft-cited lack of management personnel with technical and entrepreneurial expertise. These are relatively well-defined problems with relatively obvious solutions: more and better engineering programs at local universities, more courses with a technical orientation at local MBA programs, and higher enrollments in both.

The lack of ‘hard’ or technical skills among entry level workers in manufacturing, while extremely daunting, is also relatively well understood. Possible solutions to this shortage involve the strengthening of two-year technical degree programs at local community colleges and the resurrecting of high school vocational education programs. Industry should be involved in partnership with these programs to ensure that the skills taught match those needed by NEO firms.

Across industries however, executives maintain that there is a shortage of qualified entry-level workers with high school degrees. Secondary schools are blamed for this lack of skills, but secondary school performance, at least on the national level, is better now than it has been since the lows of the 1970s. There is some evidence that what is being called a lack of basic work skills would be more accurately labeled a lack of behavioral skills and attitudes that are necessary in the workplace. In other words, the skill shortage for some firms and maybe industries appears to be less a ‘craft’ problem than a ‘character’ problem.²⁰

²⁰ Cappelli, P. and M. Iannozi. “Rethinking the Skills Gap: Is it Craft or Character?” *EQW Issues*. No. 9. 1995.

Conscientiousness, optimism in the approach towards work, motivation and commitment appear to be missing among the entry-level workforce. Therefore, the skill shortage is not only a problem of technical skills, but of behavioral skills as well, and should become more so under HPWS. The flatter hierarchies associated with flexible organizations of work will transfer decision-making to lower levels, with less supervision. This new organization of work will require not only richer problem-solving skills, but commitment to the process and the ability to work both autonomously and collaboratively.

The implication is that ‘soft’ as well as ‘hard’ skills must be considered in setting workforce goals for the future and must be incorporated into the development of occupational and educational standards to achieve those goals. Importantly, behavioral skills have been notably ignored in the policy arena surrounding education, but appear to be becoming more and more critical in the workplace. This is another reason why industry must be involved in supporting and directing the development of the workforce of the future. ‘Work-based learning schemes’ such as internships and cooperative education will be invaluable in ramping up the level of behavioral skills in the region, since bringing students into the workplace early will illustrate the behavior and attitudes that will be necessary to ensure their future employability.

V. Implications for Higher Education in NEO

All of the above has implications for coming changes in the role of higher education in preparing the workforce for the needs of the future. Although many implications of these issues cut across elementary, secondary and post-secondary education, this section focuses on the impacts on higher education.

Higher Education in Northeast Ohio

One of the implications of the above is that the demand for college educated labor will continue to climb into the future, in most firms and across industries. It is significant, therefore, that the Northeast Ohio region lags the nation in terms of the proportion of adults with four years of college. While the proportion of adults with four years of college in the state of Ohio has increased since the mid-1940s, the state of Ohio as a whole under-performed the U.S. over this period. The percent of adults with four years of college in the state of Ohio grew from about 5%

in 1945 (on par with the U.S. as a whole) to about 17% in 1990 (compared to over 20% for the U.S. as a whole.) More locally, the same research shows that in 1996, the Cleveland-Akron region's college-educated population was 6% below the median of 35 competitive metropolitan regions.²¹

Given these figures and the implications of the above trends, it is obvious that higher education in Northeast Ohio faces serious challenges into the next century. In a larger context, higher education as it relates to educating the workforce has faced four major changes over the 1990s: the rise of new constituencies and clients, including women, minorities, and a variety of non-traditional students; demands for changing curriculum to involve new technology, computer literacy, the special concerns of minority groups and non-traditional students, and safety and health issues; the impact of IT in enabling new approaches to teaching and service delivery; and the emergence of new post-secondary education and training providers that compete for students.²² Each of these issues will be just as critical, if not more so, in the coming decades.

The Need for Partnerships Between Industry and Higher Education

The successful workforce of the future will be a more highly educated workforce, whether the product of expanded vocational education, technical degree programs at the community college level, or four-year and higher degree programs at the university level. The increasing use of IT in the workplace, HPWS, globalization, and heightened competition all imply that higher skills of all sorts will be necessary in the future, and that institutions of higher education will be called on to provide a substantial proportion of these skills. The questions surrounding the composition of skills that will actually be needed by the region's workforce is obviously paramount, but very uncertain. Still, the region's institutions of higher education must prepare themselves. Hence, scholars are calling for increased collaboration between industry and educational institutions, that is, systems of education and training in which industry is enrolled as a partner in the development of curriculum and standards of excellence.

²¹ Fogarty, M. S. "Choosing Productivity – A Framework for Investing in Education and Technology to build the Cleveland Region's Future." Presentation. Center for Regional Economic Issues. Weatherhead School of Management. Case Western Reserve University. March 10, 1988.

²² Gray, L.S. and J. Kornbluh. "New Directions in Labor Education." New Developments in Worker Training: A Legacy for the 1990s. Industrial Relations Research Association Series. Madison, Wisconsin. 1990.

In the coming decades, partnerships between higher education institutions and industry will be critical. One reason is an imminent crisis in the funding of higher education, for both public and private institutions. Over the past decade or so, government funding for higher education has declined. In response, private universities have increased tuition at rates substantially higher than inflation. While college enrollments have increased steadily over this period, scholars maintain that these institutions will soon face backlash in the form of reduced enrollments, leading to budget crises. Public universities struggle as well with tight budgets, a problem expected to become progressively worse. Importantly, the needs of the future workforce may require substantial reorganization on the part of higher education, and this could require substantial expenditures.

If industry is concerned about the outcome of higher education, industry will be forced to act as a partner in the funding for higher education in the absence of public support. Importantly, the more supportive of higher education is industry, the more likely that government support will continue. More importantly, however, industry involvement in coming reforms and systems of higher education will help to mitigate the problem of the uncertainty around what outcomes are really needed for the region. The NEO region's industry in partnership with its institutions of higher education would enable a curriculum that provides the outcomes needed by industry. In other words, partnerships would help to shape a demand-driven curriculum.

Standards and Competencies Versus Degrees

Over the past couple of decades, the four-year college degree has become *the* screening mechanism for employment in a large proportion of firms and industries. In fact, post-secondary institutions have been able to avoid dealing with productivity and funding problems in the past partly because a college education has become the benchmark for employability everywhere in industry, and student enrollments have spiked in response.²³ It has become apparent, however, that “a college degree, while absolutely necessary, is no longer sufficient to ensure successful lifelong careers. To progress beyond entry-level jobs and compete for higher paying positions,

²³ Fein Jr., C.E. and B.V. Manno. “American Higher Education: Behind the Emerald City’s Curtain.” Hudson Institute Briefing Paper No. 188. April 1996.

particularly those in new technical fields, many Americans need continuing access to job-related skills training.”²⁴ If this is the case, preparing the workforce of the future requires that the system of higher education provides not only traditional college degrees for its traditional student base, but also specific skill training and certification for an increasingly large non-traditional student base.

The importance of industry involvement in future higher education systems becomes critical here. According to some, if U.S. industry does not become actively involved in reforming the system and curriculum of higher education, the value of the college degree, on which industry relies as a credential, could deteriorate just as the value of the high school degree has.²⁵ Industry should step in and influence the market for higher education as a consumer, through defining and communicating its needs, insisting on quality, and selectively supporting education suppliers.

Industry should also encourage the development of skill and competency standards, based on occupational skills, which can be used as screening mechanisms for employment along with the college degree. In this way, the value of the college degree would not deteriorate, but would exist side-by-side with standards that are focused on the needs of the workplace. Perhaps the college degree would reflect that the degree-holder possesses the cognitive and adaptive skills required by industry, while the credential would reflect that the holder has met a uniform standard in some set of technical or ‘hard skills.’ Importantly, if industry is involved in the development of occupation-specific skill standards, these standards will more quickly become legitimized as uniform screening mechanisms for employment.

Obstacles to Industry/Higher Education Partnerships

The need for increased collaboration between industry and institutions of higher education is apparent. The scope of this collaboration and in what forms it will take place in the NEO region are undetermined, however. There are a number of obstacles to industry/higher education partnerships that must be considered, mainly relating to the competing objectives and differences

²⁴ Zemsky, R. and P. Oedel. “A Matter of Degrees: Workforce Changes and Higher Education.” *EQW Issues*. No. 8. 1994.

²⁵ *Ibid.*

in approach of each party. Institutions of higher education tend to be motivated by issues of funding, prestige and politics, while industry is motivated by economic return. For example, when enlisted for support in the development of demand-driven curriculum, industrial organizations will be motivated by the question ‘what’s in it for me?’ Higher education institutions and industry will likely mistrust one another to a certain degree until mutual trust is achieved through experience. The presence of an intermediary who is trusted by both parties may facilitate the partnership.

Impact of Information Technology on Higher Education

Innovations in information technology are expected to greatly influence the ways that teaching and learning occur. One of the most discussed changes is a trend towards ‘distributed learning.’ With advancements in communications technology, teaching will no longer have to occur in a centralized location. Therefore, institutions of higher education may develop a deeper branch system in which students will take classes simultaneously in locations local to them, digitally broadcast from the professor’s location. An expected side effect of the dispersion of the geography of higher education is increased competition, since smaller, more flexible providers may become stronger.

Other potential implications of the use of IT in teaching and learning include:²⁶

- Realization of economies of scale as distributed learning becomes feasible.
- Mass customization, that is, individualized instruction and self-paced learning on a large scale.
- Greater choice and control over the learning process by students.

A New System of Higher Education

In order to meet the needs of the students/workforce of the future in an atmosphere of tight funding and competition, higher education may be forced to undergo the kind of reorganization that is ongoing in industry; that is, a transformation from the traditional structure of hierarchical authority to one with flatter, team-based management and other elements of HPWS. Researchers

²⁶ Massy, W.F. and R. Zemsky. “Using Information Technology to Enhance Academic Productivity.” White Paper for the Educom Roundtable. National Learning Infrastructure Initiative. June 1995.

suggest that the governance and authority system at higher education institutions must change so that the relative value of departments, programs and systems may be assessed in order to reallocate resources efficiently. This will entail improving performance-based assessment methods for faculty as well as staff, and integrating administrative and accounting systems across departments and colleges.²⁷ Streamlining and reengineering should help to mitigate the fiscal crises faced by many institutions.

Researchers also call for greater mission differentiation on the part of institutions of higher education in order to satisfy the needs of a growing number of different constituencies with changing and varied needs. As the funding for higher education has declined and become more competitive, many institutions have attempted to broaden their offerings and programs in order to attract different student bases and their tuition dollars. This ‘mission creep’ has created a system with substantial overlap in offerings; the system would be more efficient if each set of institutions focused instead on its comparative advantage. One proposed structure for the higher education system has community colleges taking the lead in workforce preparation; state universities taking the lead in teacher training and research and technical assistance for regional economic development; and major research institutions focussing on research and graduate education.²⁸

The Need for Lifelong Learning

Lastly, the economy is only in the beginning stages of a transformation that will be lengthy and ongoing into the next century. The pace of technological innovation will continue while the direction may change; industry will reorganize and then find more efficient forms of organization, and then reorganize again. One implication of constant technological and industrial change is that skill needs may change many times over; as one author puts it, technical skills will have an increasingly short half-life.²⁹ In this environment, a worker will no longer be able to learn one set of skills and rely on that set to carry her through the many phases of her career. This suggests the need for ‘lifelong learning’ on the part of the workforce, and further,

²⁷ “Breaking the Social Contract: The Fiscal Crisis in Higher Education.” Report by RAND for the Commission on National Investment in Higher Education. 1996.

²⁸ Ibid.

²⁹ Barner.

the need for a ‘learning continuum’ to provide it. To ensure their employability amidst continuous change in the workplace, workers will need to take part in learning activities throughout their lifetimes. Institutions of higher education must consider this burgeoning need for lifelong learning and provide programs accordingly: educational programs that are shorter in duration, more focused on skills or standards, and meet the needs of a variety of constituencies at varied stages of their careers.

Conclusion

The macro issues facing the Northeast Ohio workforce are daunting and uncertain. Globalization and heightened competition set the stage for the reorganization of work, hastened by ongoing advancements in technology. Advanced information technology promises to change products and processes, as well as the structure of firms and industries. The implications for skills needed by the NEO workforce are complex. The demand for higher-skilled labor is sure to rise, but the actual mix is unknown. The demand for lower-skilled labor in the future is less certain, but skill needs at all levels will definitely rise. Importantly, it appears that the workforce of the future will need not only improved technical skills, but a range of cognitive and behavioral skills. It is certain that technological literacy will be a requirement for most workers.

The optimal composition of skills for the NEO workforce depends fundamentally on the characteristics of the region: the industry and firm mix, the orientation and scope of the region’s markets, and importantly, the rate of implementation of new technology and work reorganization. To anticipate the needs of industry, partnership and communication between industry, regional policy-makers and educational institutions are critical. In particular, if the system of higher education is to reorganize and improve within this context, the involvement of industry will be invaluable for direction and support.

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