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AUTHOR	Imel, Susan
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ABSTRACT

Although not all current jobs require basic computer skills, technological advances in society have created new jobs and changed the ways many existing jobs are performed. Clearly, workers who are proficient in technology have a greater advantage in the current workplace and the need for technologically proficient workers will only continue to grow. Two aspects of technology proficiency include the demand for information technology (IT) workers and the need for all workers to become more proficient in the use of technology. Because they are in short supply, IT workers have great flexibility in today's job market, including the ability to make frequent job changes. Technology is present even in nontechnical workplaces; consequently, the job security of workers who are not specifically classified as IT workers is also tied to technological proficiency. As adult, career, and vocational educators prepare workers who are technologically proficient, they should ask themselves three things: what individuals really need to exist in the work environment; what curricular and instructional responses are required to prepare workers; and how possible inequalities affecting individuals' ability to acquire and maintain technological proficiency should be addressed. (A 18-item annotated bibliography constitutes the majority of this document.) (MN)

Technological Proficiency as a Key to Job Security Trends and Issues Alert No. 6

Susan Imel

ERIC Clearinghouse on Adult, Career, and Vocational Education
Center on Education and Training for Employment
College of Education
The Ohio State University
1900 Kenny Road
Columbus, OH 43210-1090

ERIC Clearinghouse on Adult, Career, and Vocational Education

by Susan Imel

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Technological Proficiency as a Key to Job Security

It will not be possible to survive in the workplace without basic computer skills. (Kemske 1998, p. 54)

This prediction is indicative of the growing importance of technology proficiency in the workplace. Although not all current jobs require basic computer skills, technological advances in society have created new jobs and changed the ways in which many "old" jobs are performed. Clearly, workers who are proficient in technology have a greater advantage in the current workplace and the need for technologically proficient workers will only continue to grow. This *Alert* reviews some of the trends and issues related to technological proficiency and its relationship to job security. A list of resources for further information is included.

Two aspects of technology proficiency include the demand for information technology (IT) workers and the need for all workers to become more proficient in the use of technology. IT workers, those in such occupations as computer scientists and engineers, systems analysts, and computer programmers (*America's New Deficit* 1997), are among the most sought after in the current job market (ibid., Judy and D'Amico 1997; Lee 1998; Schutzman 1999). A 1998 study conducted by the Information Technology Association of America estimated that 346,000 or approximately 10% of IT positions are unfilled (Schutzman 1999). The most critical areas of shortage are in database management, Internet/intranet development, network management, object-oriented design and programming, and operating systems programming and support (ibid.). Because of the shortage, IT workers have great flexibility in today's job market, including the ability to make frequent job changes (Lee 1998).

Because technology is present in even nontechnical workplaces, the job security of workers who are not specifically classified as IT workers is also tied to technological proficiency (Ginsburg and Elmore 1998). "Workers who know relatively little about technology, who carry with them negative attitudes and anxieties toward computers, or who have a difficult time learning to use technology or upgrading existing technology skills may find themselves on the lower end of a professional hierarchy" (ibid., p. 1). When competing for new jobs, individuals with computer skills also have an advantage (Bishop 1995; Chen and Bankston 1998; Dutton 1998).

A number of challenges or issues are affiliated with the increasing need for technology proficiency in the workplace. Several have to do with the human side of technological proficiency. Can technology be introduced in ways that provide job security for workers as they learn new skills or will the need for technology proficiency mean job loss and the creation of an underclass of workers who are not technologically proficient (Directorate General V 1996; Ginsburg and Elmore 1998)? Will workers who have traditionally been at a disadvantage in the workplace be further disadvantaged by the need for technological proficiency? For example, gender and race may play a role in the extent to which individuals are able to acquire and maintain technological proficiency (Directorate General V 1996; Lewis 1996; Reardon 1997).

As adult, career, and vocational educators prepare workers who are technologically proficient, they should ask themselves "What do individuals really need to exist in the work environment?"; "What should the curricular and instructional responses be to prepare workers?" (Lewis 1996), and "How can possible inequalities be addressed?" By addressing these and other similar questions, educators will be responsible not just to the demands of the workplace but also to the students whom they serve.

Resources

America's New Deficit: The Shortage of Information Technology Workers. Washington, DC: Office of Technology Policy, U.S. Department of Commerce, 1997. (ED 412360)

Many information technology (IT) jobs are unfilled because of a shortage of qualified workers and the formal, 4-year education system is producing only a small proportion of the workers required. Severe shortages could undermine U.S. innovation, productivity, and competitiveness in world markets.

Bishop, John. *Expertise and Excellence. Working Paper 95-13.* Ithaca, NY: School of Industrial and Labor Relations, Cornell University, 1995. (ED 389 853)

Over a dozen years of research on the preparation of young people for work is summarized in this paper. Getting a job related to one's area of training is essential for the training to pay off so greater emphasis needs to given to ensure that graduates find such employment. Furthermore, the payoff to teaching workers how to use major computer applications effectively is large.

Chen, Joyce, and Bankston, Ronnie. 'The Diffusion of Computer Skills in Communication Curricula: Is There a Gap between the Educational Experience and Employers' Needs?" Paper presented at the annual meeting of the Central States Communication Association, Chicago, IL, April, 1998. (ED 420 886)

The rates of adoption of information technologies among business, education, government, and family/individual have varied, which may have created knowledge gaps. An analysis of the gap between prospective employers and communications graduates indicates that the majority of companies surveyed did not perceive a gap. However, many communications alumni described the gap as "computer literate people get better jobs."

Directorate General V, Employment, Industrial Relations and Social Affairs. *Green Paper. Living and Working in the Information Society: People First.* Brussels, Belgium: European Commission, 1996. <http://www.ispo.cec.be/infosoc/legreg/docs/peopl1st.html>

Argues for public policies that can help reap the benefits of technological progress and also ensure equitable access to the information society and a fair distribution of the potential for prosperity. Focuses on key issues of the organization of work, employment, and social cohesion related to the development of the European information society.

Dutton, Gail. "Retirees Take an Encore." *HR Focus* 75, no. 5 (May 1998): 1, 6-7.

The shortage of skilled information technology workers is a boon for retirees and for the companies that hire them. Because many retirees are computer-literate and familiar with current software programs, they can return to work successfully.

Ginsburg, Lynda, and Elmore, Jennifer. *Technology in the Workplace: Issues of Workers' Skills. Technical Report.* Philadelphia: Consortium for Advanced Education and Training Technologies and National Center on Adult Literacy, 1998. (ED 417 302)

This report examines the growing need for workers to expand their professional repertoire to include technology skills in the workplace and discusses basic skills demanded by most jobs. Included is a discussion of workers' need to anticipate and cope with rapidly changing technologies; a number of affective responses to these changes is examined.

Greengard, Samuel. "Storing, Shaping and Sharing Collective Wisdom." *Workforce* 77, 10 (October 1998): 82-88.

Managing and sharing knowledge within organizations using sophisticated technology is emerging as one of the trends in competitive workplaces. Knowledge management (KM) establishes human and technological networks that permit collective expertise and wisdom to be shared. In order for an organization to benefit from the knowledge all workers possess, all workers must have the skills to use KM technology.

Judy, Richard W., and D'Amico, Carol. *Workforce 2000: Work and Workers in the 21st Century.* Indianapolis, IN: Hudson Institute, 1997. (ED 409 463)

Provides information about what lies ahead in the future employment scene as well as what workers should do to prepare for the future. Includes information about forces shaping the U.S. economy, and how and why the nature of work is changing.

Kemske, Floyd. "HR 2008: A Forecast Based on Our Exclusive Study." *Workforce* 77, no. 1 (January 1998): 46-60.

Reports on the results of a 6-month study commissioned by *Workforce* that was designed to determine the direction of the human resource profession and the workplace in the next 10 years. The importance of technological skills is highlighted in several of the findings.

Koonce, Richard. "How to Be High-Tech and High-Touch." *Training and Development* 52, no. 10 (October 1998): 22.

Emphasizes the role of the training professional in a workplace that is changing rapidly because of technological innovation. Trainers must support companies in their efforts to implement changes and also help manage the human factors related to the changes.

Lee, Chris. "The Hunt for Skilled Workers." *Training* 34, no. 2 (December 1997): 26-33.

In a tight labor marker, those who have the skills that the workplace is demanding, including expertise in technology, can replace a lost job or find a new one relatively easily.

Lewis, Theodore. "Studying the Impact of Technology on Work and Jobs." *Journal of Industrial Teacher Education* 33, no. 3 (Spring 1996): 44-65.

Focuses on the issues, challenges, and approaches that must be considered when studying the impact of technology on work and jobs. Examines relevant theory, research hypotheses and questions, conceptual frameworks, methodologies, and the problem of operationalizing and measuring skills.

Lewis, Theodore. *Toward the 21st Century: Retrospect, Prospect for American Vocationalism. Information Series No. 373.* Columbus: ERIC Clearinghouse on Adult, Career, and Vocational Education, Center on Education and Training for Employment, the Ohio State University, 1998. (ED 423 421) <http://ericacve.org/mp_lewis_01.asp>

Reviews the economic, social, technological and educational changes that have influenced vocational education in the late 20th century. Considers the implications of these changes for secondary and postsecondary institutions.

North, Alexa Bryans, and Worth, William E. "Workplace Competencies: Trends in Advertised Entry-Level Technology, Interpersonal, and Basic Communication Job Skills, 1992-1995." *Office Systems Research Journal* 15, no. 1 (Spring 1997): 1-6

Analysis of 1,400 classified ads identified an increase in those specifically identifying entry-level technology and interpersonal skills. Ads identifying basic skills related to communication declined significantly.

Olson, Lynn. "The New Basics in School-to-Work." *Educational Leadership* 55, no. 6 (March 1998): 50-53.

Among the skills needed for success in today's economy is the ability to use technology. The author observed this skill and others in visiting school-to-work sites and profiles exemplary programs teaching these skills.

Reardon, Elaine. "Demand-Side Changes and the Relative Economic Progress of Black Men: 1940-90." *Journal of Human Resources* 32, no. 1 (Winter 1997): 69-97.

Census data from 1940-90 show that skill demands due to technological change accelerated inequality for less-skilled workers, partly accounting for the slowed economic progress of black men. It is not female and immigrant labor market entrants, but increased competition from middle-skilled white men that appears to have adverse influence on black males' economic progress.

Schutzman, Rosanne. "Students Need Diversified Skills." *Empowering Educators to Integrate Gender Equity in the Classroom. Equity News Alert* no. 48 (Summer 1999): 1-3.

The author, a technology professional, discusses the numerous skills needed for success in today's rapidly changing technology industry. The role of education in solving skilled work force shortages is stressed.

Zeiss, Tony, and Associates. *Developing the World's Best Workforce: An Agenda for America's Community Colleges.* Washington, DC: Community College Press, American Association of Community Colleges, 1997.

This publication reports on the results of the National Workforce Development Study that surveyed employers, consumers, and community college providers. The study indicates that community colleges are the preferred providers of work force training and that there is an expanding need for more work force training, especially for existing workers.

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AND TRAINING FOR EMPLOYMENT
COLLEGE OF EDUCATION
THE OHIO STATE UNIVERSITY
1900 Kenny Road • Columbus, Ohio 43210-1090