

Advancing the Innovation Economy in Washington State: The Critical Role of Workforce Development

Prepared by

Alan Hardcastle

Washington State University Energy Program

and

Kyra Kester

Washington State University, Social and Economic Sciences Research Center

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Washington State University Energy Program
905 Plum Street SE, P.O. Box 43165, Olympia, Washington 98504-3165

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ACRONYMS AND ABBREVIATIONS

ACT	American College Test
ARRA	American Recovery and Reinvestment Act
AWS	American Welding Society
BCG	Boston Consulting Group
BLS	U.S. Bureau of Labor Statistics
Commerce	Washington State Department of Commerce
CWD	Center for Workforce Development, University of Wisconsin – Milwaukee
GDP	gross domestic product
ICT	information and communication technology
IT	information technology
ITIF	Information Technology and Innovation Foundation
JSP	Job Skills Program
MSSC	Manufacturing Skill Standards Council
NIMS	National Institute for Metalworking Skills
OFM	Washington Office of Financial Management
PSM	Professional Science Master’s degree
RA	Registered Apprenticeship
SBCTC	Washington State Board for Community and Technical Colleges
STEM	science, technology, engineering and mathematics
U.S. BLS	U.S. Bureau of Labor Statistics
UW	University of Washington
WBL	work-based learning
WDOA	Washington Department of Agriculture
WISER	World Institute of Strategic Economic Research
WSU	Washington State University
WTECB	Washington State Workforce Training and Education Coordinating Board

EXECUTIVE SUMMARY

This report describes some of the state's key strengths, opportunities and challenges as it develops the state's innovation economy. Critical among them are the underlying labor and workforce development issues that affect the state's ability to accelerate a near-term economic recovery and ensure long-term prosperity.

Heeding these issues is urgent. The long-term success of Washington's innovation economy requires the critical enhancement of knowledge and skills in the workforce that will drive and support it. Recovery is not complete. Unemployment remains high following many mass layoffs, and the tepid recovery has proven especially hard on certain groups of workers and job seekers, especially seniors and youth; certain ethnic minority groups; the poor; and those with little postsecondary education and low skill levels. Members of these groups are destined to be the state's future labor pool. If Washington does not act, the unemployment disparity and lack of educational preparation will lead to widening economic and skills gaps for many citizens that will affect Washington businesses well into the future. The long-range ramifications of under-skilled workers loom even larger as the economy moves forward into its innovation age.

Meeting the demand for ever-higher levels of knowledge and skill means that Washington's workforce education and training system must both equip incumbent workers with the skills needed by employers for near-term opportunities, and expand opportunities for continued education at all levels of postsecondary education and training, including the highest levels of academic preparation.

College attainment must not be controversial. By one measure, Washington state is projected to generate over 1 million job vacancies between 2008 and 2018, both from new jobs and from job openings due to retirement. By 2018, 67 percent of these jobs are expected to require some postsecondary training beyond high school – whether through an apprenticeship, two-year college, university or other professional training. It is worth noting that 36 percent of all jobs in the state will require a bachelor's degree or higher. This estimate exceeds the national average and places Washington at sixth place among all states.

Throughout this paper, the authors recommend actions that, taken together, would strengthen Washington's workforce, as summarized here.

RAISE THE SKILLS OF THE CURRENT WORKFORCE

Washington's current workforce is under-skilled for the opportunities that exist and are being developed. Many of those displaced in the recession will not find new employment without additional training. Even today's incumbent workers are at risk if their skills do not expand. To

address the rising skill demand, Washington should upgrade its current workforce system in several ways, including:

- Continue industry-specific and regional workforce initiatives, but insure that business and worker representatives from the innovation economy are actively involved. The businesses that expanded even in recession and those emerging most strongly in the new economy must be an integral part of workforce policy and delivery.
- Convene an inclusive conversation about joint public and private responsibilities for the workforce system. This is new, critical territory: how can the public and private sectors share responsibility for training and education that meet business needs in an era of government contraction?
- Improve the system's flexibility and responsiveness to the rapid changes in an innovation economy. Washington should investigate models used in other states and nations for applicability in Washington.
- Emphasize information technology skills, increasingly essential to employment. Individual efforts to help the unemployed and incumbent workers gain higher skills must become more consistent and more universally available.
- Reconsider the outcome measures employed for workforce training for the innovation economy. While this work has been initiated in Washington, it must become a central part of the state's assessment of workforce development efficacy.

CREATE THE NEXT WORKFORCE FOR THE INNOVATION ECONOMY

While Washington's current workforce needs assistance, service to those workers must not come at the cost of reduced education and training for the next generation of workers. The future of the state rests with the workers it educates and trains now for business opportunities in the future. Washington should:

- Continue the effort to improve the quality of Washington students' basic education – the educational foundation of each individual. Tough economic times must not be allowed to erode progress.
 - Continue – and enhance – the efforts to include all kinds of Washingtonians at all levels of education.
 - Expand use of work-based learning, service learning and other delivery methods as a means of inclusion.
 - Expand career planning at all levels of education to help individuals navigate the education and workforce systems.
- Improve the flexibility and responsiveness of postsecondary education and training opportunities:

- Address the unique needs of adult learners, including increased opportunities for applied learning, and online learning options to expand participation.
- Evolve academic programs at all levels to address the learning and workforce development needs of the innovation economy.
- Encourage industry-education partnerships at all levels and in more disciplines.
- Expand apprenticeship opportunities.

In the end, this change is about making sure that workforce development encompasses the entire range of education and training in the public sector. It must include sub-baccalaureate programs and degrees, but it cannot remain relegated strictly to them; to be effective, Washington's workforce development system must be truly comprehensive in scope and in practice.

ENSURE THAT THE CREATIVE CLASS HAPPENS

Not only must the concept of workforce development become more expansive, it must also deepen. Building a workforce to support the innovation economy means applying innovation to workforce development itself. Washington's workers must have more than a single set of discrete skills: they must be flexible and able to think, analyze and create. This will require new and more complex policies and programs to:

- Educate for jobs now and for the future,
- Emphasize the most important new skill – learning to learn, and
- Support learning through effective planning, career information and support for students and workers.

These tasks are critical to ensuring that Washington supports and expands its economic advantages. The system today contains substantial gaps that leave workers without marketable skills and employers with unmet labor needs. No single activity can satisfy the sundry ways in which Washingtonians prepare for and advance in the workforce, but the state can do more to ensure opportunities for learning that address our current and future needs.

WORKFORCE DEVELOPMENT FOR WASHINGTON STATE IS URGENT

This report describes some of the state's key economic strengths, opportunities and challenges, and the underlying labor and workforce development issues that impact them. The state's ability to accelerate a near-term economic recovery and ensure long-term prosperity increasingly rests with Washington's ability to pursue and achieve the promise of an *innovation economy*, marked by both a skilled and a creative workforce. Recovery and growth depend on the development of new products and services that leverage our competitive strengths and that are responsive to new markets and future opportunities.

The primary premise of this report is that the long-term success of Washington's innovation economy rests on enhancing the levels of knowledge and skill of the workforce that is needed to drive and support it. Thus, while there exists a heightened sense of urgency to succeed in revitalizing and re-shaping our state's economy, an increasingly important measure of our success is how we choose to develop the talents and skills of our workforce to support innovation.

WASHINGTON'S ECONOMY TODAY

Like the rest of the nation, Washington has suffered the effects of the worst recession since the Great Depression. But our state has weathered the recession better than many states, and Washington's tepid economic recovery has begun to accelerate, due in no small measure to its fundamental strengths in key industry sectors, the enterprising nature of its business leaders, innovative new products and services, and the continued pursuit of global and domestic markets. These foundational strengths form an enviable platform for renewed economic vitality going forward. Yet, the state must resolve some formidable challenges while it pursues these opportunities, many of which depend on its ability to develop and nurture its most fundamental of resources: its workforce.

FIRST, THE GOOD NEWS: TRADE AND INNOVATION

Global trade is widely accepted as a mainstay of Washington's economy. It always has been: the state's economy began with the export of logs and lumber, fish and minerals, and flourished on the strength of its agriculture. Exports remain vital to the state's robust

agricultural sector.¹ From the mid-20th century, however, exports have been dominated by airplanes and aerospace, even as new industries that produce new products have expanded.² The difficult-to-measure export of software and other technical "service" products marks Washington as a leader of the nation's information economy.³ And investments made in Washington for technical and medical research are intended to reach – and benefit – the world.

Fortunately, the industries that export have been prospering in Washington, a trend that is accelerating as the state slowly recovers from the recession. In 2011, export of Washington-originated products rose 21 percent to a new high of \$64.6 billion.⁴ The state continued to benefit from its strong ties with Asia, particularly China. The Boeing Company's global exports rebounded, up 16.4 percent from 2010, almost to the all-time high of 2007. At the same time, the state's agricultural exports, at \$13 billion, were the third highest in the nation.⁵ Altogether, even though the state's exports were only 4.4 percent of the nation's total, the World Institute of Strategic Economic Research (WISER) calculated that Washington was the nation's leading exporter per capita – a fact readily and widely proclaimed throughout the state.

Washingtonians work hard to make this happen. Exports mean global competition, which requires Washington to produce its goods to international standards. Washington's exports include many that in the past were produced largely by unskilled or semi-skilled labor. Now, those products are subject to intense quality controls, and their producers require a more sophisticated understanding of the markets to which they sell. Agribusiness, as an example, is changing; while it still relies on field workers for a major part of its employment, it increasingly

¹ Washington State Department of Agriculture (WDOA), *Agriculture: A Cornerstone of Washington's Economy*, 8/23/2012: <http://agr.wa.gov/AgInWa/>.

² Even though exports were up overall, in 2011 aerospace lost ground slightly in its percentage of the value of state exports, down from 64% to 61%. Washington State University, *Export Trends in Washington State*, WSU Extension Fact Sheet FS076E.

³ Some researchers have noted the challenges associated with accurately counting and measuring the export of Washington-made software; other high-technology products; and construction, wholesale and retail services that are central to an increasingly service-based economy but do not go through a port and so are not included in standard export data. See Andrew J. Casey, *The Collection and Description of Washington State Export Data*, WSU Extension Fact Sheet FS006E: <http://cru.cahe.wsu.edu/CEPublications/FS006E/FS006E.pdf>.

⁴ Susan Ford, "Seattle Tech Job Market Growing Rapidly," *ITBusinessEdge*: <http://www.itbusinessedge.com/cm/blogs/hall/seattle-tech-job-market-growing-rapidly/?cs=50492>. However, this is criticized as a misinterpretation of the nation's export data. See Andrew Casey, cited above.

⁵ Steve Wilhelm, "Boeing Boosted Washington State Exports in 2011," *Puget Sound Business Journal*, 2/15/2012: <http://www.bizjournals.com/seattle/news/2012/02/15/boeing-boosted-washington-state.html>. And WDOA cited above.

requires more workers with technical skills in agricultural science, information technology, transportation and international trade.⁶

Similarly, Washington's aerospace sector faces relentless competition. Aerospace directly employs 92,000 workers in 153 companies, and there are over 600 companies that provide goods and services to the aerospace industry sector. The Boeing Company alone provided 16.4 percent of the state economy in 2011 (\$27.1 billion).⁷ The strong resurgence of manufacturing has drawn attention to the state, adding 12,000 jobs from 2004 to 2008 – the second highest gain in the United States. Washington manufacturers employ nearly 260,000 workers in companies with \$123.2 billion in revenue.⁸ The state Department of Commerce (Commerce) reports that manufacturing exports also were the highest per capita in the nation in 2009, and predict a strong future for *high tech/advanced manufacturing* exports.⁹

Washington's information technology workforce is also expanding. The Technology Alliance recently reported that in the first half of 2011, nearly 400,000 workers – 13.6 percent of all Washington employment (including the self-employed) – were in technical jobs. And the value of those jobs was in excess of \$42 billion.¹⁰ Significantly, this represented an increase of 15,000 jobs since 2010, with average salaries of \$94,531 (compared to the state average of \$49,680).¹¹

Forbes magazine (2011) anointed Seattle as the top city in the nation for technical job growth, citing 12 percent growth in technical jobs and 7.6 percent growth in the broader STEM (science, technology, engineering and mathematics) job categories over the last two years. And this is not a recent surge; *Forbes* reported that for the decade 2001 – 2011, employment

⁶ As an example, see the case study on export marketing of apples to Taiwan: <http://www.scribd.com/doc/22645593/Export-Marketing-APPLES-Case-Study>.

⁷ Washington State Department of Commerce, <http://www.choosewashington.com/industries/aerospace/Pages/default.aspx>.

⁸ Manufacturing information provided by Washington State Department of Commerce: <http://www.choosewashington.com/industries/manufacturing/Pages/default.aspx>.

⁹ Washington State Department of Commerce, *Washington State Manufacturing Exports*, 5/24/2010: <http://www.wedc.wa.gov/Download%20files/ManufacturingExports.pdf>.

¹⁰ William B. Beyers, *The Economic Impact of Technology-Based Industries in Washington State*, prepared for the Technology Alliance, 5/2012: http://www.technology-alliance.com/documents/TA_EconomicImpact_2012_FINAL.pdf.

¹¹ *Ibid.* Both of these average wage figures are lower than in 2010, showing the overall effect of the recession.

grew 43 percent in technical jobs and 18 percent in STEM.¹² Clearly, the workforce of high-tech industries is a critical part of a robust economic future for the state.

The most recent Information Technology and Innovation Foundation (ITIF) study (2010) continues research done for reports in 1999, 2002, 2007 and 2008.¹³ Of the indicators it uses to measure *innovation capacity*, the first is "knowledge jobs," for which they include employment of managers, professionals and technicians; education levels of the entire workforce; immigration of knowledge workers; migration of American knowledge workers; employment in "high-value added" manufacturing; and employment of information technology (IT) professionals outside the IT industry. Washington ranked high in the report, but not first.

From the report:

Washington state ranked fourth in 2007 and second in 2008, and has maintained its second-place standing. Washington scores high due not only to its strength in software (in no small part due to Microsoft) and aviation (Boeing), but also because of the entrepreneurial hotbed of activity that has developed in the Puget Sound region, and very strong use of digital technologies by all sectors.

Although it is not Washington's only high-technology zone, Seattle is arguably the state's main innovation hub, with leading-edge companies led and supported by a group of highly educated scientists, engineers, entrepreneurs and other professionals who are known to stimulate and thrive on innovation.¹⁴ This group of creative professionals, called the *Creative Class*, possesses a diverse range of skills, work and lifestyle preferences; is known by the inclusion of business leaders who can spawn innovative companies and products that attract knowledge-based workers who can enhance competitiveness; and have the potential to boost the economic development of the region and state.

¹² Joel Kotkin, "The Best Cities for Technology Jobs," *Forbes*, 11/18/2011: <http://www.forbes.com/sites/joelkotkin/2011/11/18/the-best-cities-for-technology-jobs/>. Seattle has generally enjoyed lower rates of unemployment, when compared to the state average, throughout the recession.

¹³ "The 2010 New State Economy Index: Benchmarking transformation in the states," 2010. ITIF, see: <http://www.itif.org/files/2010-state-new-economy-index.pdf>

¹⁴ Seattle was ranked among the top five cities with highly creative professionals and innovative companies, including well-known firms such as Microsoft, REI, Nintendo, Amazon.com, Nordstrom and Tully's. See: Richard Florida, *Cities and the Creative Class*, New York: Routledge, 2005.

Upon this enviable platform rests the state's current economic development objectives, which stress the importance of research, development and clean/high-tech innovations that can be commercialized and sold in growing export markets.¹⁵ With history as a guide, it seems likely that our future economic success will continue to rest on the shoulders of both a creative class of business and technology entrepreneurs, and an increasingly educated and skilled workforce. Thus, creating and supporting the workforce of an innovation economy is a main concern of this report.

SECOND, THE THREATS

However robust and forward-looking Washington's economy appears, however, it is also in recession when compared to other states and nations. Even with its many strengths, the state's economy is under threat. While weaknesses may seem greatest at the national level, Washington shares the nation's challenges.

THE NATION'S ECONOMY, WASHINGTON'S ECONOMY

Some perspective is required when discussing the current economic challenges. What do we know from the past that can be useful now? How is this recession like any other, and how is it different? It is important to keep in mind that the recession that started in 2007-2008 is not considered as bad as the Great Depression, which lasted over a decade and was marked by sustained double-digit unemployment. And the national unemployment rate was actually higher in the early 1980s, although there are some notable exceptions:

- The rate of job loss was higher in the current recession than in the 1980s.
- The rate of re-employment is substantially worse now than in the 1980s: fewer than half of those who lost jobs in the recession are re-employed and they were unemployed longer – about 35 weeks – compared to an average of 20 weeks in past recessions.

¹⁵ See recommendations of the Washington Clean Energy Leadership Council and Navigant Consulting: <http://www.washingtoncelc.org/documentarchive/>.

- The rate of pay among the re-employed is lower: about 17.5 percent less than at previous jobs and, if the worker lost a full-time job, the pay is about 21.8 percent less (marked by many moving from full-time to only part-time work).¹⁶

Unemployment remains high because, simply put, the nation has lost jobs. *Forbes* analyzed jobs lost against jobs gained and concluded:

- Between 2007 and 2009, the nation lost 800,000 more jobs due to business failures than were created by new business startups (compared to 103,000 jobs lost in the early 1990s and fewer than 300,000 jobs lost in the early 2000s).
- The largest loss came from small business, which in previous recessions had been the least affected.¹⁷

A STUBBORN RECESSION

The failure to recover is not just a statistic. It means time out of work for individuals and less income for families for a prolonged period. Nationally, the median number of "weeks unemployed" rose from 8.5 in 2007 to 21.4 in 2010. In 2007, 35.7 percent were unemployed for five weeks *or less*, and a slightly lower percentage (32.5) was unemployed for 15 weeks or longer. By 2010, only 18.7 percent returned to work in five weeks or less, while 59.3 percent were unemployed for 15 weeks or longer. The U.S. unemployment rate, which has exceeded 8 percent since 2009, is now expected to persist at or near that level until 2014.¹⁸

In Washington, too, the recession is different from past downturns (Figure 1). For instance, unemployment has been subsiding only slowly and is, in fact, now slightly higher than the national average. The U.S. unemployment rate was 8.5 percent at the end of 2011; Washington's was 9.2 percent. Washington has been gaining ground, though, and in June 2012 was only .1 percent behind the nation (U.S. = 8.2 percent; Washington = 8.3 percent). The

¹⁶ Henry Faber, "Job Loss in the Great Recession: Historical Perspective from the Displaced Workers Survey 1984-2010," National Bureau of Economic Research, 8/15/2012: <http://www.nber.org/digest/sep11/w17040.html>.

¹⁷ Scott Shane, "Hallmark of the Great Recession: Job Loss from Small Business Closure," *Forbes*, 4/29/2012: <http://www.forbes.com/sites/scottshane/2012/04/29/hallmark-of-the-great-recession-job-loss-from-small-business-closure/>.

¹⁸ The official unemployment rate excludes those individuals who would like to work but have not searched for a job in the past four weeks, as well as those who are working part-time but would prefer full-time work. If those people were counted among the unemployed, the unemployment rate in January 2012 would have been about 15 percent. See U.S. Congressional Budget Office, *Understanding and Responding to Persistently High Unemployment*, 2/2012.

Washington Employment Security Department reports that the state lost about 200,000 jobs in the recession and, by April 2012, had only regained about 91,000.¹⁹

Unemployment is also lasting longer in Washington (Figure 2).²⁰ By the end of 2011, 70 percent of those who had lost their jobs during the recession remained unemployed. Only 25 percent of those who had exhausted benefits had found jobs.

Perhaps most telling is the impact of the recession on wages among those who did manage to find jobs: Of those who were re-employed, they now earn an average of 30 percent less than before the recession.²¹ By April 2012, nearly 70,000 people who filed for unemployment during the recession were still out of work, benefits exhausted. Of course, this does not include individuals who simply gave up on their job search and failed to file at all.

The situation is improving slightly. In 2010, the average time an unemployed worker collected benefits was 42.2 weeks; by the end of 2011, it was 36.2 weeks.²² But the length and depth of the recession has had a profoundly negative impact on employment across the economy.

¹⁹ Paul Trause, "Is the State Recovering from the Recession?" *The Capitol Record*, 4/18/2012: www.capitolrecord.tvw.org.

²⁰ Scott Bailey, *Recession & Recovery: A Detailed Look at the Washington Labor Market*, Employment Security Department, Yakima, 7/26/2012: <https://fortress.wa.gov/esd/employmentdata/reports-publications/presentations/economic-symposiums>.

²¹ Christina Salerno, "Is the State Recovering from the Recession?" *The Capitol Record*, 4/18/2012: <http://capitolrecord.tvw.org/2012/04/is-the-state-recovering-from-the-recession/>.

²² Employment Security Department, *2011 Slightly Off of Record-Breaking Pace of 2010*, news release, 12/21/2011: <http://www.esd.wa.gov/newsandinformation/releases/archives/2011/2011-off-recording-pace-of-2010.php>.

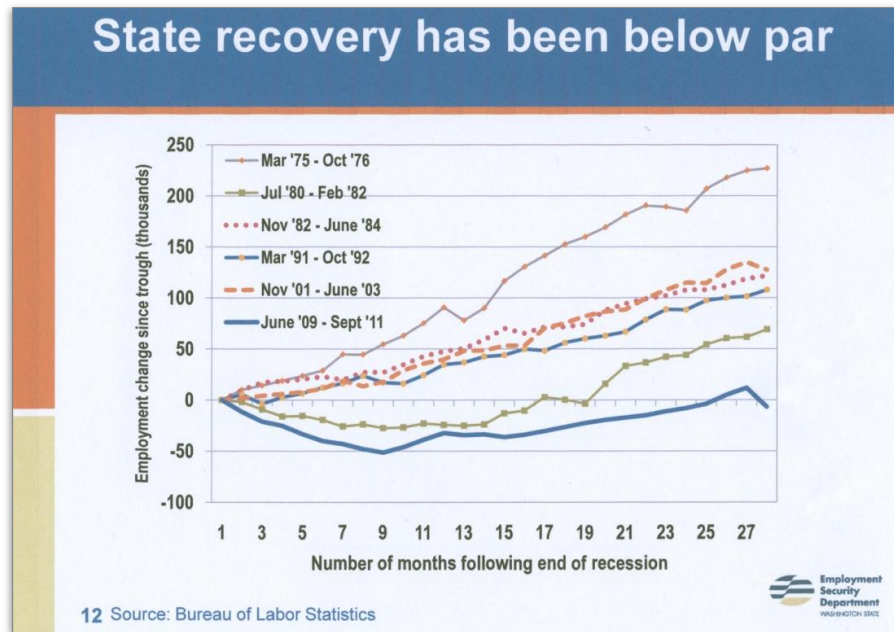


Figure 1. Washington State Jobs Recovery

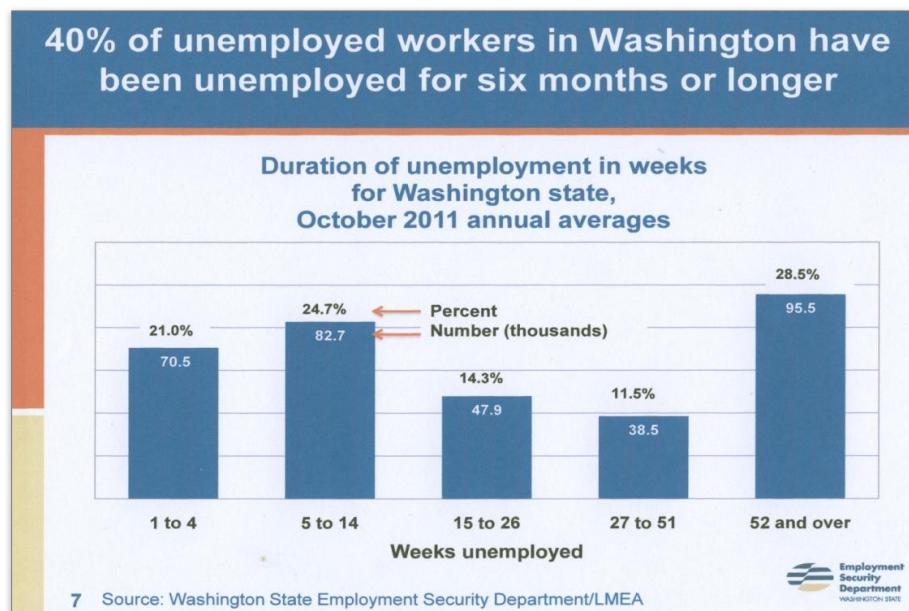


Figure 2. Duration of Unemployment in Washington State

THE IMPACT OF LAYOFFS

The national recession was also characterized by more mass layoffs than other post-Depression recessions.²³ In February 2009, American employers took 3,059 mass layoff actions involving 326,392 workers (Figure 3).²⁴ The wide-ranging effects of such substantial, prolonged declines in employment for the nation, communities, families and individuals are not surprising. Indeed, the negative impacts of long-term unemployment on economies, family life, and physical and mental health are well-known and have been extensively documented in the research literature.²⁵

The slow, uneven economic recovery further exacerbated the difficulty of finding new employment for individuals across the entire economy.

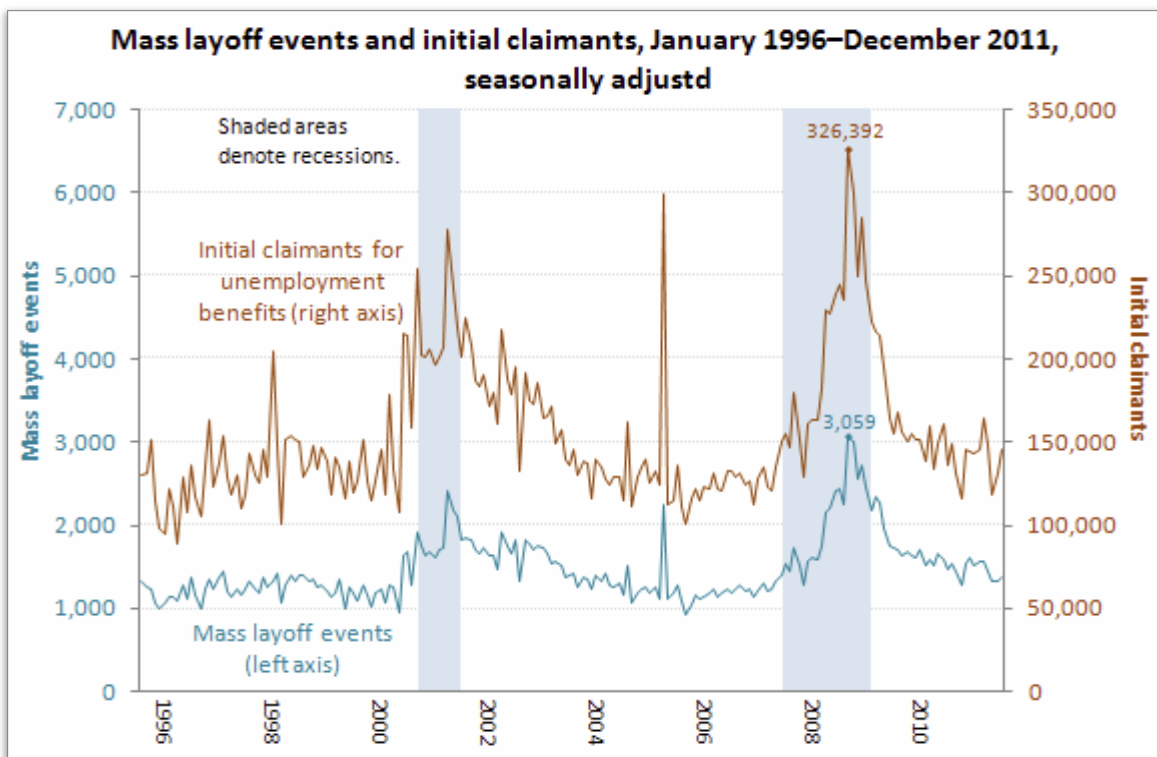


Figure 3. U.S. Layoff Statistics, January 1996 – December 2011

²³ A mass layoff is defined as the filing of at least 50 first claims for unemployment insurance against a single establishment during a consecutive five-week period.

²⁴ U.S. Bureau of Labor Statistics (U.S. BLS), *The Recession of 2007-2009*, 2/2012: <http://www.bls.gov/spotlight/2012/recession/>.

²⁵ Paul Taylor, et al., *The Impact of Long-Term Unemployment: Lost Income, Lost Friends – and Loss of Self-Respect*. Washington, D.C.: Pew Research Center, 7/22/2010: <http://pewresearch.org/pubs/1674/poll-impact-long-termunemployment>. Also: T. von Wachter, et al., "Long-Term Earnings Losses Due to Mass Layoffs During the 1982 Recession: An Analysis Using U.S. Administrative Data from 1974 to 2004," draft, Columbia University, 4/2009. Also: K. Couch, K. and D. Placzek, "Earnings Losses of Displaced Workers Revisited," *American Economic Review*, 100(1): 572-589, 2010.

In Washington, too, layoffs have been a consistent feature of the recession: since 2007, over 95,000 Washington residents lost jobs due to mass layoffs.²⁶ Table 1 illustrates that the total number of mass layoffs in the state peaked in 2009 and were associated with an increase in unemployment claims that year. By the end of 2011, the number of mass layoffs had declined, but did not stop; approximately 21,000 layoffs were reported for the year, with the largest losses occurring in manufacturing, construction, and administrative and waste services.²⁷ Over 50 percent of initial claims for unemployment insurance in 2011 originated from those three industries combined.²⁸

²⁶ By definition, each layoff involved at least 50 workers from a single employer.

²⁷ U.S. BLS, *Mass Layoffs in Washington, 2011 Annual Totals*, 7/24/2012: <http://www.bls.gov/ro9/mlswa.pdf>.

²⁸ Because construction layoffs occurred throughout 2010, administrative services had the largest increase in mass layoff-related initial claims from 2010 to 2011, at 1,248, followed by manufacturing (648) and local government (321). Local government had the greatest year-to-year increase, with claims up 65%. See: *Mass Layoffs in Washington, 2011 Annual Totals*.

Table 1. Mass Layoffs and Unemployment Insurance Claims, Washington State, 2008-2011

Industry	Mass layoff events				Initial claims for unemployment insurance				
	2008	2009	2010	2011	2008	2009	2010	2011	Total
Total, all industries	260	325	230	229	26,446	28,539	19,346	20,988	95,319

Washington's situation might have been far worse without the federal *Shared Work* program, which allowed employers to cut full-time workers' hours up to 50 percent while providing partial unemployment benefits to the affected workers. In 2010, 3,700 businesses participated in this program; in 2011, that number dropped only to 3,000 businesses. In March 2012, 2,100 employers were still participating. The Employment Security Department estimates that *Shared Work* saved approximately 26,000 jobs. Employers give the program high marks; in a 2011 survey, two-thirds of the employers who had participated said the program helped their company survive and 20 percent more said it "probably" had.²⁹

RECESSIONARY EFFECTS VARY

Ample data shows that the impact of the recession varied considerably among different segments of the population. In many cases, the recession has disproportionately affected workers by age, gender, ethnicity, socioeconomic status, and education and skill levels. These differences are instructive not only for the short-term negative effects on individuals and families, which are notable, but also for the long-term implications for the quality and productivity of Washington's workforce. Typical effects of economic recessions on different groups are described here.

SENIORS

Older workers and those with long tenure in their previous job are especially vulnerable because new jobs for those workers typically pay less and offer less potential for earnings growth.³⁰ Seniors did not suffer the highest unemployment rate, but they have been unemployed longer than most other groups.³¹ Between 2007 and 2010, unemployment among

²⁹ Employment Security Department, *Layoff-Avoidance Program Keeps Washington Businesses Afloat*, news release, 3/29/2012: <http://www.esd.wa.gov/newsandinformation/releases/archives/2012/layoff-avoidance-program-keeps-businesses-afloat-12-012.php>.

³⁰ U.S. Congressional Budget Office, *The United States is Experiencing the Longest Stretch of High Unemployment Since the Great Depression*, 2/2012: <http://www.cbo.gov/publication/42977>.

³¹ U.S. Bureau of Labor Statistics (BLS): http://www.bls.gov/opub/ils/summary_10_04/older_workers.htm and "Seniors and the 2007-2009 Recession," Zillner *Insight Center Briefs*: <https://www.zillner.com/insights/seniors-the-2007-2009-recession/>.

seniors increased from an average of eight to 29 weeks. Many of these workers had retirement accounts devastated by the recession and banking crisis, while others lost real estate values in the housing market decline. Many older workers were shifted from defined benefit to defined contribution retirement plans beginning in the 1990s, so they have to continue working to finance anticipated longer life expectancy and recoup fiscal losses.³²

YOUTH

People who start their careers (typically after completing school) in times of high unemployment tend to have persistently lower earnings than their counterparts who begin seeking work under better economic circumstances. Nationally, youth are a hard-hit sector of the workforce. According to analysis by the *Wall Street Journal*, 53,000 young adults aged 20-24 are unemployed and 17.8 percent of them have less than a high school diploma with which to compete for jobs.³³

Employees with housing and banking losses hold on to jobs, and those squeezed out of middle management drift into lower-skilled, lower-paid work. The effect has been to retard youth entry and progression in the workforce.³⁴ The greater impact is on young males.³⁵ Further, the situation is not improving: the national unemployment rate for youth 16 to 19 years of age was over 36 percent in July 2012.³⁶

Washington shares in the youth displacement problems of the nation. The three youngest worker cohorts (ages 16 to 34 combined) represented over 58 percent of the unemployed in the state in 2011, as well as the highest rates of change in unemployment. Youth from 16 to 19 years old had an unemployment rate of over 30 percent in 2011, an increase of nearly 13 percent over 2007.³⁷

GENDER

In one study using national data, men were found to lose an average of 1.4 years of pre-displacement earnings if displaced in mass layoff events that occur when the national

³² U.S. BLS: http://www.bls.gov/opub/ils/summary_10_04/older_workers.htm#ils_older_table1.

³³ Michael B. Sauter, Alexander E. M. Hess and Lisa Nelson, "Ten States Where Young People Can't Find Work," *Wall Street Journal*, 7/23/2012: <http://247wallst.com/2012/07/23/ten-states-where-young-people-cant-find-work/2/>.

³⁴ The U.S. BLS defines a "young adult" as those born in the last recession, in 1980 and 1981. "Youth" are variously categorized as 16 to 19 and 16 to 24 years old.

³⁵ U.S. BLS: http://www.bls.gov/spotlight/2012/recession/pdf/recession_bls_spotlight.pdf, page 9.

³⁶ *Ibid.*, page 14.

³⁷ Sauter et al., *op. cit.*

unemployment rate is below 6 percent. The earnings losses doubled (to 2.8 years of pre-displacement earnings) when the unemployment rate exceeds 8 percent.³⁸ In another study, male job dislocation was higher in the manufacturing and construction industries hit hard by the downturn, but many of those affected by later layoffs, especially of government workers, were disproportionately female.³⁹ Employment gains made by women in non-traditional occupations, such as construction and other trades, also eroded as a result of the recession, which may stall state labor force development in the future, when women are forecast to comprise a larger percentage of the available workforce.⁴⁰

ETHNICITY

The differential effect of the recession is perhaps most evident when comparing unemployment by ethnic group (Figure 4). State data shows that, while unemployment rates for people of color were already high in 2007, the rates rose considerably during the recession. In 2011, the unemployment rate was 9.1 percent for whites, but over 19 percent for blacks and nearly 15 percent for Latinos.⁴¹ These groups typically earn considerably less than whites or Asians, working in lower-skilled, lower-paid jobs across the economy.⁴²

It is also worth noting state population forecasts, which show that Washington's future workforce is destined to become much more ethnically diverse.⁴³ At the same time, however, these same ethnic groups are typically under-represented in postsecondary education, a problem made worse by high unemployment rates and shrinking state education budgets, which have traditionally included education and training support services for these disadvantaged groups.

³⁸ S. Davis and T. von Wachter, *Recessions and the costs of job loss*, University of Chicago and Columbia University, prepared for the Brookings Papers on Economic Activity, 11/11/2011.

³⁹ Susan Adams, "Romney Claims On Women's Job Loss Paint a Misleading Picture," *Forbes*, 4/12/2012: <http://www.forbes.com/sites/susanadams/2012/04/12/romney-claims-on-womens-job-loss-paint-a-misleading-picture/>.

⁴⁰ Washington Office of Financial Management (OFM), *Long-Term Features of the Washington Labor Force*: <http://www.ofm.wa.gov/economy/longterm/2012/lt2012ch2.pdf>. Also: Economic Opportunity Institute, *The State of Working Washington: Who's Prospering, Who's Not – and How We Can Build Economic Prosperity for All*, p.18, 9/2008: www.eoionline.org/State_Economy/reports/StateofWorkingWashington-Sep08.pdf.

⁴¹ Scott Bailey, *Recession and Recovery: A Detailed Look at the Washington Labor Market*, Employment Security Department, 5/2012: <https://fortress.wa.gov/esd/employmentdata/docs/presentations/recession-and-recovery-yakima-2012.pdf>.

⁴² U.S. BLS, *Labor force characteristics by race and ethnicity, 2011*, U.S. Department of Labor, Report 1036, 8/2012: <http://www.bls.gov/cps/cpsrace2011.pdf>.

⁴³ OFM, *op. cit.*

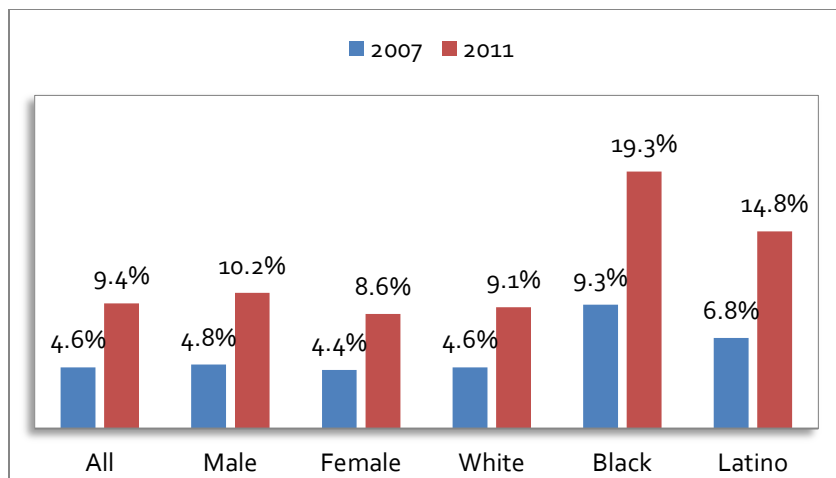


Figure 4. Washington Unemployment Rates by Ethnic Group, 2007 vs. 2011

JOB SKILLS

All across the economy, layoffs and stagnant growth that came on the heels of the recession have been hardest on lower-skilled workers with limited education or training, including members of certain ethnic groups, who are disproportionately represented in lower-skill, lower-paying jobs. Often, these are individuals who have been dislocated by manufacturing plant closures or through the severe cutbacks in the construction industry caused by the housing market collapse. Many of these workers lack flexible or transferable skills and require retraining for re-employment.

Research suggests that time out of the workforce, while job seeking or gaining training, contributes to considerable, permanent income losses.⁴⁴ The U.S. Bureau of Labor Statistics (BLS) found that among individuals with three or more years of experience who were laid off between 2007 and 2009 – but who were working again in early 2010 – 55 percent earned less per week than in their previous job, and 36 percent had at least a 20 percent cut in weekly earnings.⁴⁵ Displaced workers also have greater earnings instability and more frequent joblessness than other workers.⁴⁶

Moreover, long-term job displacement also contributes to the perceived and actual erosion of job skills. Some employers perceive that jobless individuals are unemployed because they lack the skills to remain employed. In other cases, long-term unemployment contributes to the real

⁴⁴ Taylor, et al., *op. cit.* Also: von Wachter, et al., *op. cit.*

⁴⁵ U.S. Congressional Budget Office, *Understanding and responding to persistently high unemployment*, 2/2012.

⁴⁶ Ann H. Stevens, "Persistent effects of job displacement: The importance of multiple job losses," *Journal of Labor Economics*, 15(1), 165-188.

erosion of job skills due to time away from the workplace and the lack of formal and informal upgrade skills training that typically occurs while on the job.⁴⁷ In either case, long-term unemployment sets up a pernicious cycle that erodes the real and perceived job skills and employability of dislocated workers.

WHAT DOES IT ALL MEAN?

Despite its many strengths, Washington's economy was not immune from the effects of the recession, which has taken a great toll on employment and the economic futures of its citizens. While the downturn cut across the entire economy, the resulting unemployment and related economic hardships hurt some population groups much more than others. Layoffs eroded some of the gains made by women in non-traditional jobs and worsened the prospects for entire groups of ethnic minorities that are destined to become the state's fastest-growing source of new labor.

IMPACT OF BUDGET CUTS

The state budget shortfall caused cuts in education, training and basic support services that are critical to re-employment. They are equally essential to ensure that aspiring new job seekers and current workers are able to acquire the skills needed to be productive and advance their careers in an increasingly global economy. Reduced funding for these services and programs raises important questions about the state's ability to achieve its economic development goals if it does not adequately invest in its current and future workforce.

Cuts in education funding may erode gains made in recent years to advance the skills of Washington's high school graduates. They may also undermine or eliminate critical programs that support students who have traditionally struggled in Washington's schools. Given the importance of all workers in the future economy, which is discussed further below, it is an inopportune time to retreat from critical work undertaken to improve graduation rates and college readiness for all young Washingtonians. Reducing investment in workforce training for STEM fields at all postsecondary levels is similarly short sighted. *Indeed, innovation in education and training is as vital an investment by the public sector as research and development is in private enterprise.*

Representatives of the public and private sectors should seize the opportunity to apply innovation in education and training, particularly in public-private partnerships. How to

⁴⁷ U.S. Congressional Budget Office, *op. cit.*

balance the limits of public investment with the public and private benefit that results is an urgent conversation for the state.

NEED FOR AN INNOVATION ECONOMY

At least one analysis sheds some light on the challenges going forward. *Tough Choices or Tough Times: The Report of the New Commission on the Skills of the American Workforce* summarizes many changes that have occurred in the U.S. since the Commission's first report in 1990.⁴⁸ Although the report was produced in 2007, it is instructive in its prediction that rising globalization in business would push low-skill, low-pay jobs from the U.S. to other countries around the world. The mechanical automation that began with the Industrial Revolution chiefly eliminated mechanical, low-skill jobs in the U.S. Today, machines are smarter and they displace more complex activities – and occupations. The authors recommended improving the skills of American workers to assure their employment in better-paying jobs, producing high-quality products and services.

Americans now must compete with workers from other nations who are more highly skilled and highly educated than ever before. At the same time, the U.S. has dropped from serving 30 percent of the world's college students to 14 percent, and that figure continues to decline.

But producing more highly educated, highly skilled workers alone is not enough. As the digital world makes high-quality products and services instantly available anywhere, workers must be uniquely qualified to produce these premium products and services. With ease of replication also escalating, the pace of producing new "cutting edge" products and services will continue to escalate, raising employers' expectations about the levels of skill required of job seekers and incumbent workers alike.

The authors of *Tough Times* describe the factors that ensure success under these conditions:

It depends on a deep vein of creativity that is constantly renewing itself, and on a myriad of people who can imagine how people can use things that have never been available before, create ingenious marketing and sales campaigns, write books, build furniture, make movies, and imagine new kinds of software that will capture people's imagination and become indispensable to millions.

⁴⁸ National Center on Education and the Economy, *Tough Choices or Tough Times: The Report of the New Commission on the Skills of the American Workforce*, Washington, D.C., 2007, p. 4: http://www.skillscommission.org/wp-content/uploads/2010/05/ToughChoices_EXECSUM.pdf. Full report available in print from www.jossey-bass.com. For the earlier report, see *America's Choice: High Skills or Low Wages! The Report of the Commission on the Skills of the American Workforce*: http://www.eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED323297&ERICExtSearch_SearchType_0=no&accno=ED323297.

This is a world in which a very high level of preparation in reading, writing, speaking, mathematics, science, literature, history, and the arts will be an indispensable foundation for everything that comes after for most members of the workforce. It is a world in which comfort with ideas and abstractions is the passport to a good job, in which creativity and innovation are the key to the good life, in which high levels of education — a very different kind of education than most of us have had — are going to be the only security there is.⁴⁹

Moreover, these demanding attributes must be possessed by workers who do not currently fare well in the U.S. educational system. How to ensure that more of our workforce achieves these skills at a high level is the central question for workforce development.

NEED FOR ALL WORKERS

According to BLS, total employment should rise considerably in the U.S. during the decade ending in 2020.⁵⁰ Part of the rise reflects the effects of the 2008 recession, which was still suppressing employment as the decade began. Overall, BLS expects 54.8 million total job openings from 2010 to 2020. Although a high percentage of jobs will not require postsecondary education, three projections are notable:

- By 2020, over 20 percent of all jobs will require a bachelor's degree or higher for entry into employment.
- Among degree-related education needed to enter employment, the steepest increase in demand (21.7 percent) will occur in occupations requiring a master's degree.
- Among positions for which on-the-job training is the customary preparation, those requiring completion of a formal apprenticeship should increase the most (22.5 percent).

At the same time, the demographics of the nation's labor force will be shifting.⁵¹ Overall, the U.S. population is growing more slowly, at only .7 percent annually, continuing a slowing trend of the last two decades. And the population is steadily aging; by 2020, the entire Baby Boom generation will be 55 or older. The percentage of the labor force in this category will rise from 19.5 percent in 2010 to 25.2 percent in 2020. By comparison, the 25 to 34 "prime" working age group will decline to 63.7 percent of the workforce, while the youngest workers, 16 to 24 years

⁴⁹ *Ibid.*, 6-7.

⁵⁰ http://www.bls.gov/news.release/archives/ecopro_02012012.pdf, page 4.

⁵¹ *Ibid.*

old, will fall to 11.2 percent by 2020. As BLS notes, "While growth will lead to many openings, more than half – 61.6 percent – will come from the need to replace workers who retire or otherwise permanently leave an occupation."⁵² BLS predicts that in 80 percent of all occupations – even those in decline overall – more openings will be caused by replacement needs than by growth. And this trend will continue into the future. By 2030, 41 million new workers will enter the workforce but 76 million will retire.⁵³

The statistics are much the same for Washington.⁵⁴ Some highlights include:

- Between 2005 and 2030, the number of workers aged 55 or older will grow by 96 percent, while those aged 16 to 54 will increase by just 7 percent.⁵⁵
- In 2030, workers aged 55 years and older are projected to represent 26.4 percent of Washington's labor force, substantially higher than the 16.4 percent share in 2005.

Delayed retirements may have provided a temporary buffer against a labor shortage in some jobs, but the ranks of retirement-eligible workers will continue to rise, and skilled workers may actually leave in larger numbers as the economy – and eligible retirees' investments – improve.

At the same time, the ethnic makeup of the workforce is shifting nationwide. By 2020, Hispanics/Spanish-speaking workers in the U.S. will number 7.7 million, up 34 percent from 2010, and their share of the labor force will rise from 14.8 percent (2010) to 18.6 percent (2020). Asian American and African American workers will also increase, by about 1 percent each. As noted earlier, Washington's workforce will also become more diverse; labor force growth rates of Asian, African American and other non-white Americans are expected to be considerably higher than that of whites.⁵⁶ From 2010 to 2030, non-white workers will account for over 41.0 percent of the state's labor force growth, and the number of Hispanic workers will double during the same period, accounting for 13.4 percent of the state's labor force by 2030.

The Washington Office of Financial Management (OFM) summed up the challenges this way:

The trend toward racial and ethnic diversification poses a critical issue in the effort to elevate worker skills in the future. Today, the average education level of African American workers of every age cohort is below their white counterparts. The gap has been narrowing, but at a slow pace. The gap for Hispanic workers is greater. In 2010,

⁵² *Ibid.*

⁵³ Skills USA, <http://www.skillsusa.org/downloads/PDF/partnerguide2.pdf>.

⁵⁴ Washington Workforce Training and Education Coordinating Board (WTECB), *High Skills High Wages 2012*, Chapter 2 – "Tomorrow's Workforce": <http://www.wtb.wa.gov/Documents/HSWWWorkforceChapter2.pdf>.

⁵⁵ OFM, *op. cit.*

⁵⁶ OFM, *op. cit.*

*only 49.5 percent of the Washington Hispanic population 25 years or older completed high school or equivalency, compared to 91.9 percent for the non-Hispanic white persons in the same age group. As future economic growth relies more and more on productivity improvement, raising the education levels of these fast-growing racial and ethnic minorities becomes a major policy focus.*⁵⁷

Many believe we are doing too little to prepare for this future labor and skills gap. Nationally, nearly 6 million youth 16 to 24 years old are neither in school nor working – an increase of 20 percent since 2000.⁵⁸ The graduation rate remains too low; in 2005, 70 percent of students graduated on time (only 66 percent among public high school students).⁵⁹ Just 50 percent of minority students graduate with their peers.⁶⁰

In Washington there are similar challenges. For example, in 2010-2011, Asian students had the highest on-time graduation rate (82.9 percent), followed by white students (80.0 percent). For most ethnic minorities, however, graduation rates are considerably lower: 66.2 percent of Pacific Islanders, 65.4 percent of blacks, 64.5 percent of Hispanics, and 56.5 percent of American Indians.⁶¹

Washington must also face the fact that it now relies on a skilled workforce that has immigrated here from other states and countries. Although Washington commonly gets high marks for the percentage of residents with high school diplomas and college degrees, it is the robust immigration of skilled workers from other states and countries that underpins those impressive numbers. In 2007, for example, about 70,000 adults relocated to Washington; of these, 57 percent had an associate or bachelor's degree.⁶²

The importance of those highly educated immigrants becomes obvious when considering the low high school graduation rates of the state's growing minority groups.⁶³ Equally troubling is

⁵⁷ *Ibid*, chapter 2, p.16

⁵⁸ Annie E Casey Foundation, Kids Count Data Center: <http://datacenter.kidscount.org/>.

⁵⁹ America's Promise Alliance: <http://www.americaspromise.org/~media/Files/Resources/CiCo9.ashx>.

⁶⁰ Harvard Education Publishing Group: <http://gseweb.harvard.edu/~hepg/dropoutsinamerica.html>.

⁶¹ Washington State Superintendent of Public Instruction, *Graduation and Dropout Statistics Annual Report 2010-11*, 2/2012.

⁶² See *Choose Washington*: www.choosewashington.com/why/educated/Pages/default.aspx. This interpretation of our workforce strength was integral to the *Forbes* "Best States" ranking, described above.

⁶³ Estimated 2011 on-time graduation rates (annual) are consistently higher for Asians (83.6%) and whites (77.7%) than for Hispanics (66.4%), blacks (63.9%), Pacific Islanders (59.6%) or American Indians (51%). See Washington Superintendent for Public Instruction, *Graduation and Dropout Statistics Annual Report 2010-11*, 3/2012: http://www.k12.wa.us/DataAdmin/pubdocs/GradDropout/10-11/GradDropoutStats_2010-11.pdf.

that these patterns also hold true in the transition from high school to college at every level.⁶⁴ For example, the first-time graduation rate from public four-year institutions of higher education for Asians and whites – 45 percent and 42 percent, respectively – leads all racial and ethnic groups.⁶⁵ In contrast, the rates for all other racial and ethnic groups are considerably lower, including Hispanics (31 percent), American Indians/Alaskan Natives (31 percent), and African Americans (22 percent).

Data on Washington's public two-year colleges show that, while access rates are high for students of color and other improvements have been made in recent years, African Americans, Hispanics and Native Americans are enrolling in pre-college (remedial) classes at considerably higher rates than white students.⁶⁶ Regarding program completion (earning a certificate or degree), apart from Asian students, substantially more needs to be done to close the gap between students of color and white students.⁶⁷

NEED FOR INNOVATION WORKERS

Left unaddressed, the unemployment disparity and lack of educational preparation will widen economic and skills gaps for many citizens and for Washington businesses well into the future. The long-range ramifications of under-skilled workers loom even larger as the economy moves forward into its innovation age.

In fact, analysis of the U.S. economy shows weakness in many areas critical to a strong innovation economy. The World Economic Forum's Global Competitiveness study used broad economic indicators to rank the U.S. fifth among 143 nations, which represents another drop

⁶⁴ See as example data presented in "Washington's Education Pipeline: A Picture of Why We Must Do Better," *Seattle Job Initiative's Beyond the Headlines*, vol. 2, 5/2010, from the National Center for Higher Education Management Systems, which reports data from 2008 indicating that for every 100 students who enter a Washington public high school, 18.1 percent will graduate from a two- or four-year college. That 18.1% rate places Washington 30th among states. Data available at: http://www.seattlejobsinitiative.com/wp-content/uploads/BeyondHeadlines_MAY2011_2.pdf.

⁶⁵ This represents the graduation rate of non-transfer students who, for the first time, entered the public, four-year institution in fall 2005 and graduated by summer 2009. See: OFM, "Graduation rates for Washington, public, four-year baccalaureate institutions," 2012: <http://ofm.wa.gov/hied/dashboard/graduation.htm>.

⁶⁶ Washington State Board for Community and Technical Colleges (SBCTC), *Access and success for people of color in Washington community and technical colleges: Progress report*, research report 09-2, 6/2009.

⁶⁷ *Ibid*. In its most recent report, SBCTC found that, with the exception of Asians (50 percent), the percent of new students of color who complete a degree or certificate, transfer, or who were still enrolled making good progress toward completion by the end of the sixth year (in 2007) lagged white students (48 percent) considerably, including African Americans (36 percent), Native Americans (35 percent), and Hispanics (30 percent).

since the last report. [By comparison, the U.S. was first in all rankings as late as the 1990s.] The study further ranked the U.S. 40th of 40 nations in "*progress on the indicators*" (emphasis added).⁶⁸

In another sign that the U.S. is losing ground in the knowledge economy, the World Bank reports that between 2000 and 2012, the U.S. slipped from fourth to twelfth place among 145 countries in its Knowledge Economy Index, an aggregate measure representing a country's or region's overall preparedness to compete in the knowledge economy.⁶⁹ The index includes a range of economic/regulatory, innovation and technology-related measures, but it also recognizes the importance of a skilled and educated workforce, including measures such as the average years of schooling, secondary enrollment and postsecondary education. *Among the reported weaknesses, declines were noted for all of the U.S. education/training-related measures.*

The Boston Consulting Group (BCG) also ranks nations on factors critical to the innovation economy, such as government and fiscal policy, education policy, and the innovation environment, which includes number of patents, technology transfer, research and development outputs, and business performance. In their most recent rankings, the U.S. was eighth of 40 nations. Although it was second among large nations (measured by gross domestic product – GDP), it has fallen behind the leaders in innovation, including Singapore, South Korea and Switzerland. Chief among its weaknesses were economic, immigration and infrastructure policy, *but also workforce quality*.⁷⁰

BCG also evaluates the effect of the Internet economy and its opportunities for nations and states. The dramatic growth of the Internet economy, expected to reach \$4.2 trillion by 2016 (compared to \$2.3 trillion in 2010), "as nearly half the world's population become web users,"⁷¹ obviously provides enormous opportunity. These opportunities are particularly relevant to Washington as the state that leads the nation in software publishing. But, as the *Forbes* 2011 article points out, technology jobs are volatile. Areas long associated with the industry, such as the Silicon Valley and Austin, Texas, did not fare well in their report because of job losses. In

⁶⁸ Klaus Schwab, *Global Competitiveness Report 2010 -2011*, World Economic Forum, 2011: <http://reports.weforum.org/global-competitiveness-2011-2012/#>. Also ITIF, *op. cit.*

⁶⁹ The World Bank, *Knowledge Economy Index (KEI) 2012 Rankings*, 2012: <http://siteresources.worldbank.org/INTUNIKAM/Resources/2012.pdf>.

⁷⁰ Jim Andrew and Andrew Taylor, *The Geography of Innovation*, BCG, 12/10/2010: https://www.bcgperspectives.com/content/articles/manufacturing_innovation_geography_of_innovation/.

⁷¹ David Dean, Sebastian DiGrande, Dominic Field and Paul Zwillenberg, "The Digital Manifesto: How Companies and Countries Can Win in the Digital Economy," *The Connected World* series, BCG, 1/27/2012: https://www.bcgperspectives.com/content/articles/growth_innovation_connected_world_digital_manifesto/.

some cases, the jobs were lost overseas, but many were company relocations to regions with qualifications that *Forbes* listed as essential to continued technology growth: better quality of life, better business conditions overall and *a more skilled labor force*.⁷²

WASHINGTON'S ECONOMIC OPTIONS

None of these conditions can be ignored if Washington is to maintain its strong position compared to other states, or even to retain any competitive advantages. Of the three qualifications *Forbes* listed as essential to continued technology growth, Washington is confident of its quality of life. The state works hard to sustain this quality, as is evident in the public and private efforts to harmonize farms, fishing, forestry, industry, hydropower, recreation and ecotourism for the benefit of all.⁷³ Washington's ranking in 2009 as the number one state for doing business (*Forbes* 2009) was rooted in its business climate, as evidenced by the balance the state works to maintain between quality of life for its residents and opportunity for its businesses.⁷⁴

Washington also has substantial strengths in its universities and its community and technical college system, which are keys to producing a skilled and educated workforce. It created a popular, effective model for overlapping secondary and postsecondary education to accelerate student education and broaden high school options for students. Running Start allows 11th and 12th grade students in Washington's public schools to take college courses at Washington's 34 community and technical colleges and five participating baccalaureates. Students earn both high school and college credits for these courses.

National dual-credit programs, such as Tech Prep, benefitted from the dual credit option in Washington, and variations such as College in the High School and Running Start for the

⁷² *Forbes*, 2011, *op. cit.*

⁷³ See the state Department of Ecology for an explanation of the ways in which state policy and practice support these critical relationships: <http://www.ecy.wa.gov/about/qualityoflife.html>. Outside reviewers often identify quality of life in Washington's cities and towns, including CNN's *Money* magazine: <http://money.cnn.com/magazines/moneymag/bplive/2011/top100/html>.

⁷⁴ *Forbes'* utilizes six categories in its *Best States* ranking: business costs, labor supply, regulatory environment, current economic climate, growth prospects and quality of life. Business costs – including labor, energy and taxes – are weighted the most heavily. Ratings are based on data from nine different sources, with [Moody's Economy.com](http://www.moody.com) the most used. See: http://www.awb.org/articles/pressreleases2009/forbes_washington_second_best_state_to_do_business.htm and <http://www.forbes.com/2009/09/23/best-states-for-business-beltway-best-states>.

Trades continue to expand Washington's effort to allow the end of high school and beginning of postsecondary education to be personalized to individual student career plans and paths.⁷⁵

For adult learners, the state's community and technical colleges developed a highly regarded model that combines on-the-job skills training with literacy and language skills development, called the Integrated Basic Education and Skills Training Program (I-BEST). The program pairs two instructors in the classroom – one to teach technical content and one to teach basic skills in mathematics, reading, writing and, as needed, English language proficiency. The combination quickly boosts literacy and work skills applied in real-world scenarios so students can earn credentials, qualify for living-wage jobs and meet employers' needs.

The I-BEST model refutes the traditional practice that requires students to complete all basic education before they can start a job-training program. The traditional approach discourages students because it takes more time, which often means time out of the labor market and earnings, and the stand-alone basic skills classes do not qualify for college credit. In contrast, I-BEST students start earning college credits immediately.⁷⁶

These programs are only two of the most well-regarded options that the state developed and supports.⁷⁷ Both have produced positive outcomes, and both are examples of what Washington accomplished by embracing a commitment to education and workforce training innovation. The state has been a national leader in developing and implementing workforce programs utilizing business-driven skill standards, partnering the public and private sectors in industry-focused skill panels, and embracing regional strategies such as Centers of Excellence (described on page 24). Washington excels in developing technical programs to meet the needs of high-tech employers like Boeing.

However, these strengths were not sufficient to make Washington immune to the recession. The state continues to be plagued by high unemployment and a very localized recovery. Efforts to spur job creation have been paramount since the recession, with new initiatives and

⁷⁵ See the Office of Superintendent of Public Instruction website for further details: <http://www.k12.wa.us/SecondaryEducation/CareerCollegeReadiness/RunningStart.aspx> and the website of the state's WTECB for information on Running Start for the Trades: <http://www.wtb.wa.gov>.

⁷⁶ For additional information, see information provided on the website of the SBCTC at: http://www.sbctc.ctc.edu/college/e_integratedbasiceducationandskillstraining.aspx.

⁷⁷ See SBCTC for annual Running Start outcomes: <http://www.sbctc.ctc.edu/college/d-high-school-reports.aspx>. See http://www.sbctc.ctc.edu/college/abepds/multivariateanalysis_workingpaper16_may2009.pdf for information on I-BEST outcomes.

legislation aimed at expanding global trade, clean energy and new construction to get Washingtonians back to work.

This renewed focus on stimulating job creation addresses the immediate need, but belies a pervasive skills gap that is likely to expand as the state works to recover and bulk-up its innovation economy. That means Washington really has two tasks at hand:

- In the short-term, retraining and matching the unemployed with current vacancies.
- In the long-term, reinventing the workforce *system* to ensure that it will continuously educate and train new workers for the economic opportunities that lie ahead.

The state must focus on the short term, creating the tightest possible connections to current vacancies and the best short-term predictions of employment that will also help minimize an individual's time out of work. But short-term training must also evolve to help more workers avoid the revolving door of job-driven training that focuses on immediate placement and gives too little attention to the skills needed for survival in rapidly changing workplaces.

The long-range goal of the workforce system must be to embrace the growing need for a different kind of worker in the future. It is no longer acceptable to think of workforce development without including all of higher education. Students must leave college with degrees and certificates that help them to be creative, innovative employees who are also continuous learners. This will require better utilization of many traditional college and university disciplines, offered in new ways and in new combinations.

These short-term and long-term tasks must overlap. Because no one can know exactly what the future opportunities will be, myriad strategies have been developed to target, develop or integrate industry sectors, clusters, zones and whole networks of producers and suppliers.

The actual impacts on employment of these different approaches can only be roughly estimated; trying to predict the specific jobs created and the associated skill requirements is an even less reliable exercise. What is clear is that Washington's economic and workforce goals are interdependent:

- The **economic development function** of states and businesses is to find and create new business opportunities.
- The **workforce development function** of states and businesses must be to identify, develop and adapt the education and training needed by individuals at all skill levels to support these new opportunities. And this work must be based on a full partnership among stakeholders.

How can we accomplish these goals?

- First, we must adapt the current education and training system to meet the changing needs of business and industry.
- Second, we must ensure that the education and training system recognizes and includes the highest levels of academic preparation.

CULTIVATING A SKILLED WORKFORCE

RAISING SKILLS IN THE CURRENT WORKFORCE

Before Washington can provide the skilled workforce that businesses need, state leaders must understand how workforce development policy and practice can be used to identify the skills needed by the diverse residents of the state.

Success in today's ever-changing, globally competitive environment demands agility – a capacity for rapid change and flexibility.

Organizations face ever-shorter cycles for the introduction of new/improved products. Nonprofit and government organizations are increasingly being asked to respond rapidly to new or emerging social and economic issues.

Major improvements in response times often require new thinking and new work systems, simplification of work units and processes, or the ability for rapid changeover from one process to another.

A cross-trained and empowered workforce is a vital asset in such a demanding environment.

Baldrige Performance Excellence Program

The state must be clear about what business needs – and know how to meet those needs. Many excellent programs already operate in Washington, but not all are available where workers need training. And even during the recession, with a larger pool of available labor to draw from, employers in many industries continue to report that their need for skilled workers is not being met.⁷⁸

Washington has developed a successful model of public and private partnerships around the state, updated its state plan for workforce development, and launched workforce initiatives that should be sustained.⁷⁹ Among the state's many strengths are its commitment to tripartite leadership (business, labor and the public sector) and innovative practices.

⁷⁸ WTECB, *2010 Washington State Employer Workforce Training Needs and Practices Survey*, 2010. Results of the 2010 Employer Survey indicate that, while the number of firms reporting a lack of suitable job candidates decreased during the recession, over 28,000 employers statewide continue to have difficulty hiring. Over 11,000 of those employers, or 41 percent, had difficulty finding potential employees with vocational certificates. Almost 24,000 employers said they had difficulty hiring employees with occupation-specific skills.

⁷⁹ WTECB, *High Skills, High Wages: Washington's 10-Year Strategic Plan for Workforce Development*, 2012: <http://www.wtb.wa.gov/Documents/HSBW2012StrategicPlan.pdf>.

A PUBLIC/PRIVATE PARTNERSHIP TO DIRECT SKILLS TRAINING

The best way to ensure that the workforce system can meet employer needs is by engaging businesses and workers in developing the training system. Business can report what is changing and how quickly. Workers can describe mismatches between training and actual skills needed on the job. Workers can also help codify skills needed for occupations in which many workers will soon retire.

In Washington, business and worker representatives now play critical roles in policy development and system evaluation through the Workforce Training and Education Coordinating Board (WTECB). Active membership fuels the technical training programs of the state's community and technical colleges, and the career education programs in high schools. And local business and labor representatives advise regional workforce development councils around the state.

Businesses and workers have participated in – and helped support – efforts to clarify the types and levels of skills required in complex occupations through skill panel initiatives and industry-defined skill standards. Washington was an early leader in convening industry leaders and experienced employees to define the skill requirements for specific occupations in leading industry sectors, such as information technology, manufacturing, agriculture, energy and allied health.⁸⁰

Washington should continue to focus on regional needs so employers and trainees remain in close proximity. That way, local employers can directly inform training programs, local workers can help deliver and codify training, trainees can have ready access to mentors and worksite learning opportunities, and students have access to career exploration opportunities. This helps trainees and students understand the occupational and workplace requirements of the industry they are exploring or are preparing to enter.

Businesses also play a vital role in the state's Centers of Excellence. Centers are led by flagship two-year institutions that target strategic industries that are central to the economic growth of a region or the state. The Centers engage industry leaders and business partners to ensure that

⁸⁰ For information of state-sponsored skill panels, see: <http://www.wtb.wa.gov/IndustrySkillPanel.asp>. Also: <http://www.wtb.wa.gov/Documents/2008SkillPanelEvaluationReport.pdf>. For information on industry skill standards established by Washington partnerships, see: http://www.sbctc.ctc.edu/college/e_skillstandards.aspx.

education providers establish fast, flexible, quality education and training programs that meet industry needs.⁸¹

Washington cannot afford to rest on its current policy and programs, however. The state must consider ways to reduce the shortfalls that continue in too many skilled occupations and address the need to reskill the unemployed for employment in the current and coming economy. To do that, Washington must consider several actions.

A CONVERSATION ABOUT SHARED RESPONSIBILITY

Each of Washington's current workforce initiatives offers potent options for engaging industry and employers to determine and respond to workforce development needs. *But a more open, public discussion is needed about the public and private responsibilities for providing this training as the state anticipates the rapid changes of an innovation economy.* This discussion becomes critical in an era of constrained public funding. Part of this conversation must define what skills are specific to an individual employer; providing training to develop these skills is the responsibility of that employer. Focusing too tightly on employers' immediate needs – at the expense of anticipating future needs – can shortchange workers, who will soon need additional retraining at the workers' and the public's expense.

Interchangeable skills that belong to an industry or employer group should be clarified so public workforce programs can focus on the skills a worker can use for more than one employer or related industry groups. That kind of flexibility is essential for workers' economic survival, and can help industry identify new sources of skilled labor. Certification or endorsement of those skills by a public or non-profit entity can bestow an influential stamp of approval on the training and its providers, which assures employers that such training programs are trustworthy and have been carefully designed to meet their needs.

IMPROVED RESPONSIVENESS

Because workplaces and occupations change quickly, the workforce development system must be able to adapt rapidly to changing demands. The state's commitment to skills panels, skill standards and Centers of Excellence should also be maintained. These collaborative efforts

⁸¹ For more information on Washington's 10 industry-based *Centers of Excellence*, see: <http://www.coewa.com/Home.aspx>.

keep the business-customer at the table with educators and trainers in a partnership that is particularly important for curriculum and assessment development and updates.

Washington should investigate best practices used in other parts of the country. A recent analysis of states' workforce development programs (focusing on their rapid economic development effects) rated five programs as most effective:⁸²

- **Louisiana's Fast Start** was created to attract jobs when businesses in targeted sectors are expanding or relocating, and do it at a faster pace than usual for the public sector. The program offers "turnkey" workforce help: employee recruitment, screening, development and delivery of pre- and post-employment training, at no cost to the companies.
- **Georgia's Quick Start** offers strategic workforce consultation, pre-employment assessment and selection, customized post-employment training, leadership and professional development provided by the state's technical colleges but delivered on-site as needed.
- **New Mexico's Job Training Incentive Program** funds classrooms and opportunities for newly created jobs for up to six months.
- **Florida's Quick Response Training Program** grants funds for customized training for new or expanding businesses. Designed for quick response, it can also be used for skill upgrades for existing employees.
- **North Carolina's Jobs Now** is a system of programs for workforce placement and training, including "12 in 6": training in 12 targeted careers that can be completed in six months of training provided by the community colleges.

All of these programs focus on immediate solutions: meeting employers' urgent needs and getting workers into jobs. They are an important component of a state's workforce arsenal, some of which may supply fresh ideas that can be successfully adapted and applied in Washington.

A FOCUS ON INFORMATION TECHNOLOGY SKILLS

Immediate solutions should not be limited to meeting immediate needs. Making more information technology skills available to anyone who needs them exemplifies a more comprehensive approach to building lasting foundational skills. Indeed, proficiency using

⁸² Analysis done for *Business Facilities Magazine*, cited by Larry Gigerich in "Why Workforce Development Programs are Growing in Importance," *Inside Indiana Business*: <http://www.insideindianabusiness.com/contributors.asp?id=1830>.

computers, software and IT is a critical skill set that is fundamental for growing an innovation economy. Building and expanding IT skills was what Microsoft attempted to address with the Elevate program, part of its response to the recession.

MICROSOFT'S ELEVATE PROGRAM

Early in 2009 as the recession deepened, Microsoft offered vouchers for on-line information and communication technology (ICT) training and certification assessments to assist workers in need of new or upgraded skills. Microsoft distributed vouchers through state agencies and recipients had 90 days to activate them, although they were usable for one year (a period that was later extended).

According to Microsoft, over 880,000 vouchers were used by workers in 32 states and the District of Columbia. About half were used for training and half for exams. Analysis of the program illustrates the extent to which the need for ICT training can be met online.⁸³ It also uncovered challenges that need to be addressed in order to deliver broad skills packages to the public, including:

- Provide more and better computers for public use,
- Remove/reduce barriers posed by public data security systems, and
- Equip workforce development personnel with skills sufficient to assist and support students.

Microsoft also recognized drawbacks with the distribution method, including the limiting factor of who was most prepared to use self-paced, on-line instruction. About 70 percent of participants had some college experience and nearly half had at least a two-year degree. This indicates that college-educated workers should not be left to find skill upgrades "on their own" than other workers and that they are willing to participate in public workforce programs. Further, it indicates that this approach was not effective at reaching workers who may have little or no familiarity with computers.⁸⁴

⁸³ Microsoft, *Microsoft's Elevate Program: Lessons Learned*, 4/2011. Participation also demonstrated differences between men and women in ICT. While 59 percent of the working population of the U.S. in 2009 was male, only 46 percent of the voucher participants were male, perhaps indicating reluctance by males to engage in ICT training or online training. Yet, while more women participated in the program, only 25 percent used the vouchers for professional-level training. See: www.microsoft.com/about/corporate-citizenship/en-us/community-tools/job-skills/elevate-america/#vouchertab.

⁸⁴ In 2011, Microsoft also partnered with the state legislature and K-12 system to launch the Microsoft IT Academy program for K-12 students that included more than 700 public high schools, skills centers and tribal schools across Washington state. A primary goal of the program was to equip students with foundational IT skills needed for student success and employment. See: <http://www.k12.wa.us/Communications/PressReleases2011/IT-Academy.aspx>.

THE LIMITED VALUE OF PLACEMENT AS THE PRIMARY DEFINITION OF SUCCESS

One thing Microsoft did not do was worry about how many of the voucher users would go directly to work because of their new skills. Yet, inherent in the structure of most workforce development programs is an almost single-minded emphasis on job placement. This is logical, but not necessarily helpful to define the kind of training needed for the new economy. Nearly all workforce programs are publicly funded, and in the current economic and political climate, every public dollar requires public accountability for outcomes that benefit the general good. Because *employed workers* are the agreed-upon outcome, the relationship between training and employment has tightened over the last four decades.⁸⁵

Since the 1990s, efforts have been made to align the performance measurement movement with private sector management theories.⁸⁶ Increasingly, public (and private non-profit) funders have required greater levels of accountability, with short-term job placement as the primary measure. This emphasis is not entirely off-target, because the consequences of unemployment – especially long-term job displacement – are negative on so many fronts. Re-employment should, indeed, be a key objective of workforce education and training, as should the prudent investment of public dollars in effective programs.

In the current environment, workforce analysts and policy makers are considering whether the intense focus on placement by many public programs overshadows other important measures. For instance, although outcomes also include expectations for retention, the objective is

⁸⁵ Joe Siedlecki and Christopher T. King, *Approaches to Adjusting Workforce Development Performance Measures*, Marshall Center for the Study of Human Resources, Johnson School of Public Affairs, University of Texas at Austin, 2005: www.utexas.edu/research/cshr/pubs/pdf/adjusting_measures.pdf. This early discussion of the Integrated Performance Project, meant to inform the performance measurement system of the federal Workforce Investment Act, discusses the emphasis on outcomes measurement in workforce programs. Additional national efforts to enhance and integrate performance information for workforce development were led by the Washington state WTECB, which has long promoted an expanded approach to performance measurement for workforce development. See: <http://www.wtb.wa.gov/Documents/HSWAccountabilityChapter3.pdf>.

⁸⁶ Susan Gerwitz, *The Dangers of Outcome Measures in Workforce Development*, Annie E. Casey Foundation, 2007: <http://annie.e.caseyfoundation.org/~media/Pubs/Topics/Economic%20Security/Workforce%20Development/DangersOutcomeMeasuresWorkforceDevelopment/gerwitz.pdf>. Mentioned are the influential “Reinventing Government” approach of David Osborne (1992) and ensuing attempts to enact those strategies in federal and local government programs, including *Trying Hard is not Good Enough* (Friedman, 2005) and *Good Stories Aren’t Enough* (Miles, 2006), all of which highlight the importance of accountability and employing the right measures by which to assess program success in the public and non-profit sectors. The workforce development field also began adopting these principles in the 1980’s Job Training Partnership Act, and then the Workforce Investment Act of 1998 required more specific outcomes and measures related to job placement and retention, as discussed in the *Approaches* paper cited above.

measured in short terms, rarely longer than a year. But economic dislocation in the modern economy occurs in waves that may be longer than a year, causing two-year-old skills to be outdated. Or this dislocation may come in very short intervals, making successful outcomes from an external, institutionalized training system nearly impossible. Similarly, wage progression (earnings trends of trainees over time) often takes several years to occur after training, but this measure is often beyond the time horizon of grant programs, even with multi-year efforts. Narrow measurement windows limit what can be measured and, thus, limit our knowledge of the longer-term effects of training.

This is not to argue against measurable performance requirements for publicly funded programs, but to encourage consideration of new definitions of the goals, strategies and tactics for workforce training. In order for training programs to be successful in cultivating flexible and innovative skills, a substantial shift in how "skills" are defined and imparted must also occur. This shift requires:

- Evolving the definition of employment from an emphasis on "placement" to a much longer view that is more akin to "retention."⁸⁷ Most placement-driven programs are targeted to provide immediate employment or educational programs of one to two years (typically certificate- rather than degree-granting programs).
- A more structured and durable partnership among employers and educators/trainers that includes – but also looks beyond – the training outcomes of immediate-need skills.
- Encouraging the workforce system/employer partnership to emphasize the long-term needs of each industry and occupation that considers the investments required to meet those needs for employers and employees alike.

While work is already underway on this issue, new standards and measures are not yet in place. These changes are essential to stimulate new approaches to workforce education and training, and to provide the performance data necessary for evaluating the effectiveness of the system.

MEASURING HIGHER SKILLS

The innovation economy will require higher levels of education and skill across the labor force. But if workforce preparation continues to be regarded as the exclusive purview of apprenticeship and sub-baccalaureate programs, who is guiding the economic/workforce/education connections at the critical baccalaureate level?

⁸⁷ The evaluation of apprenticeship effectiveness looked at wages at the end of six years, by which time all apprentices should have completed their programs; at nine years; and then at lifelong earnings estimates based on wages and costs in the post-training period.

This must be a concern of the system, which requires that student progress be monitored through the entire system. While immediate workforce needs may call for expanded technical training programs, any expansion of certificated programs should be carefully considered to ensure that they do not disproportionately reduce the ability of transfer degree programs and other agreements that connect to four-year colleges – which are also critical to advancing the state’s innovation economy – to serve students. There is substantial evidence nationwide and internationally that too much focus on short-term training goals by a college can undermine pursuit of longer-term study.⁸⁸ Washington has an excellent track record of baccalaureate transfers, and it is important to ensure that increased focus on technical training does not erode that strength.

CREATING THE NEXT WORKFORCE

Most of the workers Washington needs in the near future are in school today. And while the diversity of our workforce is steadily increasing, ethnic minorities are typically under-represented in education. Thus, the first objective is to help students continue to progress academically and develop the fundamental skills they will need to succeed in the work world and in the state’s innovation economy.

We can help ensure that this happens by utilizing strategies that are known to work, but that we have failed to bring to scale due to lack of funding, consensus or a sustained commitment to the education of all. Washington’s economy is not static, nor are the economies of its global competitors. Investment in the support services, multi-faceted educational options and a higher level of integration between the levels of education and training will be needed to keep Washington’s businesses and the workforce competitive.

MORE ADVANCED SKILLS FOR MORE PEOPLE

Providing more Washington residents with more skills will require multiple strategies designed to meet the needs of a variety of people, take into account their access to education and training resources, and address the wide range of skills needed by employers.

⁸⁸ J. Roksa, “Does the vocational focus of community colleges hinder students’ educational attainment?” *The Review of Higher Education*, 29(4), 499-526, 2006. Also: J. M. Ignash and D. Kotun, “Results of a national study of transfer in occupational/technical degrees: Policies and practices,” *Journal of Applied Research in the Community College*, 12(2), 109-120, 2005.

THE CRITICAL FOUNDATION: PRE-K THROUGH SECONDARY EDUCATION

Although efforts to discuss K-12 education as part of a workforce development system can cause consternation, the preparation of Washington's native workforce begins with a solid, basic education. As the eligible workforce grows older and becomes more ethnically diverse, – while also growing smaller in number – every potential worker will become more important. Washington cannot afford to ignore those who now leave school early or graduate with inadequate skills. Every young Washingtonian deserves – and requires – a solid foundation for his or her working future.

Educators have spent decades learning how to better educate more students and overcome the challenges of access, disability, poverty, language and culture. Increasingly, we know how to reach everyone even if we still do not utilize best practices everywhere they are needed.

The rising need for thinking skills means that we must have an educational system that is firmly aligned with the workforce system so students are prepared for postsecondary learning and training of all kinds. Neither students nor the state can afford the expense (both time and money) of providing remedial training, yet we will be forced to do just that unless – and until – all students are able to master the basic competencies needed to succeed in postsecondary education and the workplace.

A workforce system that concerns itself only with those students who intend to pursue sub-baccalaureate credentials cannot adequately assist educators to prepare, connect and advance the full range of workers needed to support an innovation economy. Nor can all levels of education anticipate how best to integrate and articulate programs, services and pedagogy to more efficiently move students through the education pipeline and into careers.

WORK-BASED LEARNING

Education and training that intentionally connects theory and practice through experiences in the workplace provide ideal, low-risk opportunities for students to test how what they are learning is relevant to occupations and the needs of employers. Work-based learning (WBL) can be designed to be appropriate for students at any grade level, beginning with basic career exploration activities, employer presentations, career days and tours of area businesses. WBL engages students in supervised hands-on experiences or simulations that are age-appropriate and safe, and that emphasize the transfer of educational content into real work.

These early experiences help answer students' questions about why certain subjects, concepts, abilities and work behaviors are important to master, and provide a valuable foundation for future education and career choices. These insights apply whether students choose to enter

the workforce directly after high school or plan to enter an apprenticeship program, two-year college or university.

For young adults, high school and college-level internships have become an increasingly common graduation requirement in Washington's secondary and postsecondary institutions, and for good reason: They help to expose students to career options, put students in direct contact with potential employers, and confirm for students the knowledge and skills required by industry. These include "soft" skills such as teamwork, critical thinking, collaborative problem solving, and the skills needed to engage socially, such as civics, ethics and multicultural competence.

Many employers embrace the goals of WBL, and recognize their value to students and to meeting their own recruiting needs. However, high-quality WBL experiences can require considerable investments by employers and their education partners to coordinate, mentor and support students to assure that students benefit from these experiences. Large companies are often able to support WBL programs more readily than smaller companies, where it can be difficult to absorb the costs of coordination and mentoring students. In the current economic environment, companies are less likely to sponsor students for paid internships due to resource constraints and staffing limitations. Although approximately 1.5 million internships are offered in the U.S. each year, the number of unpaid internships has grown as employers' budgets have tightened. Recent legal challenges about replacing workers with unpaid interns and concerns about the need for paid internships so students can support themselves may limit the availability of WBL experiences.⁸⁹

SERVICE LEARNING

Another useful strategy for youth and young adults is to offer opportunities for national service that will provide valuable work experience and link students to future careers. AmeriCorps options include the venerable VISTA, Teach for America, Learn and Serve America, and City Year programs. Motivated by their experiences, volunteers often go on to pursue education in the fields of social service, education and counseling, and enter tough occupations with realistic knowledge of the challenges and rewards.

Service learning is also happening with students as young as middle school. YouthBuild, a federal program managed by the U.S. Department of Labor, offers at-risk youth work as

⁸⁹ See: Perlin, R., *Intern Nation: How to Earn Nothing and Learn Little in the Brave New Economy*. Verso publishing, 2011. Also: *Pushing Back Against Illegal Unpaid Internships*, Economic Policy Institute, 3/2/2012: <http://www.epi.org/blog/pushing-back-illegal-unpaid-internships/>

construction workers, learning new green and energy-efficient techniques. The non-profit Citizen Schools offer unpaid apprenticeships to middle school students, connecting them with the world of work and raising their aspirations.⁹⁰

In both work- and service-based learning, new pedagogy and tools must be employed that effectively integrate academic and WBL opportunities for students of all ages. As research identifies new techniques to advance all learners, it is urgent to embrace them. Among those that should be more fully utilized are strategies that:

- Set new targets (learning to learn),
- Utilize new approaches to learning using technology (blended learning), and
- Tell us more about non-traditional students (especially adult learners).

FILL THE PLANNING GAP

Not everyone is equally ready for postsecondary education. Too many of the students who earn a diploma from Washington high schools are not ready to do college-level work. This creates an urgent role for the state, in policy and in practice, to maximize the returns on public, employer and personal investments in postsecondary education. Students must know how to learn in a postsecondary environment, which can be markedly different from a secondary school. Not enough students understand the importance of preparing for postsecondary education or training, and too few plan their next steps after high school.

Even when students are qualified academically, they may not choose the best path in college. Based on the self-reports of students taking the 2010 American College Test (ACT) to demonstrate college readiness skills, too many high school graduates enter college to prepare for occupations with low demand.⁹¹ College advising can help these students become better informed about career options, but there are real drawbacks to using the first years of college for career exploration. Not only are students who change their areas of study less likely to complete their degree on time, they are spending extra time and money and restricting the capacity of the college to serve others, all while employers wait for skilled workers.

In summary, the strategies just described will help more youth and adults complete their foundation skills and see for themselves what opportunities are available to them. Planning,

⁹⁰ Rosabeth Moss Kantor, "To Create Jobs, Break the ICE: Innovate, Collaborate, Educate," *Huffington Post*, 6/24/2012: http://www.huffingtonpost.com/rosabeth-moss-kanter/to-create-jobs-break-the-ice_b_1622465.html; <http://www.citizenschools.org/>; http://www.cityyear.org/default_ektid22283.aspx; <http://www.americorps.gov/>.

⁹¹ ACT, *Changing Lives, Building a Workforce: Preparing Community College Students for Jobs and Careers*: http://www.act.org/research/policymakers/pdf/changing_lives.pdf.

workplace and service exposures provide solid information about the skills needed for a variety of careers, which will, in turn, demonstrate the importance of postsecondary preparation. To fulfill the promise of those lessons, however, more opportunity must exist for postsecondary education and training.

MORE POSTSECONDARY EDUCATION FOR MORE PEOPLE

Among the attributes most important to employers is potential employees' *college exposure*. According to the BLS, between 1992 and 2009, the number of employed workers with at least some college attendance, a degree or a certificate grew from 27 million to 44 million – an increase of more than 64 percent.⁹² In 2009, well into the recession, the unemployment rate for workers with a bachelor's degree or higher was 4.9 percent, compared to nearly 15 percent for workers without a high school diploma. By July 2012, the unemployment rates for these two groups had declined only modestly, to 4.1 and 12.7 percent, respectively.⁹³

The same is true in Washington, where college education correlates directly with rates of employment. Historically, people with higher levels of education have had lower rates of unemployment. In 2009, for instance, nearly 20 percent of Washingtonians who did not finish high school were unemployed, compared with 12.1 percent of high school graduates. By contrast, only 8.1 percent of those who completed at least some college were unemployed and only 4.8 percent of those with a bachelor's degree or higher did not have a job.⁹⁴ In an economic downturn, when jobs become scarce, education is even more important because employers rely on the level of education – including degrees and certificates – as a key way to compare the qualifications of job applicants.

Moreover, research on the effects of a college education in the Washington labor market shows that substantial earnings and employment advantages accrue to students who pass the “tipping point” of completing at least one year at a community or technical college and earning a work-related credential.⁹⁵

⁹² U.S. BLS, *Spotlight on Statistics: Back to College*, 9/2011: <http://www.bls.gov/spotlight/2010/college/>.

⁹³ U.S. BLS, *Employment status of the civilian population 25 years and over by educational attainment*, Economic News Release, Table A-4, 8/2012: <http://www.bls.gov/news.release/empsit.to4.htm>.

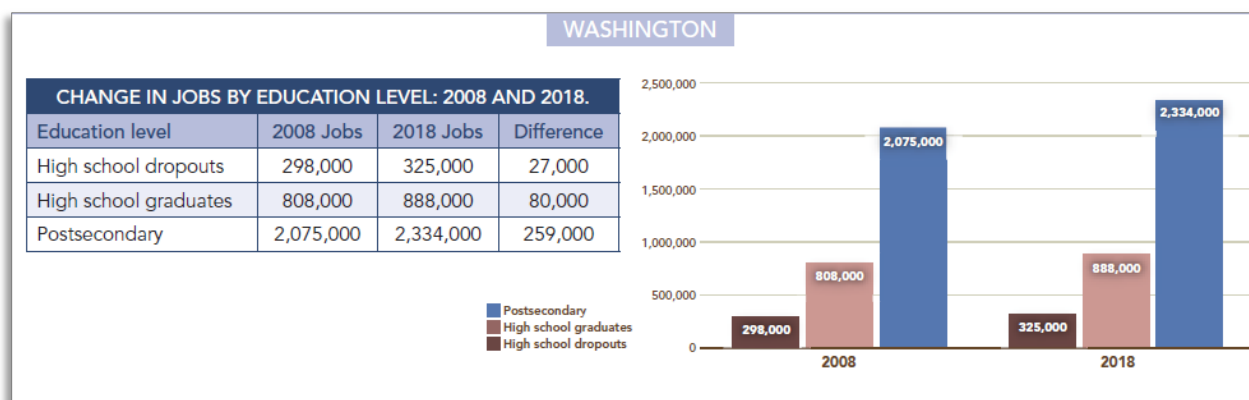
⁹⁴ Economic Policy Institute, *Wages and Income by Education*, based on analysis of U.S. BLS, Current Population Survey data for 2009: <http://www.stateofworkingwa.org/2011/swwa/wages-income/education.htm>.

⁹⁵ SBCTC, *Building Pathways to Success for Low-Skill Adult Students: Lessons for Community College Policy and Practice from a Longitudinal Student Tracking Study*, Research Report No. 06-2, 4/2005: http://www.sbctc.edu/docs/data/research_reports/resh_06-2_tipping_point.pdf.

As noted throughout this report, the changes inherent in an innovation-based economy are likely to require more postsecondary education for employees in the future. This shift, which education researcher Anthony Carnevale refers to as an emerging “college economy,” provides additional support for the need to increase the proportion of students and incumbent workers who participate in postsecondary education of all types.⁹⁶

Carnevale projects that between 2008 and 2018, Washington state will create over 1 million job vacancies, both from new jobs and from job openings due to retirement (see Figures 5 and 6). By 2018, 67 percent of these jobs are expected to require some postsecondary training beyond high school, which is four percentage points above the national average of 63 percent. This puts Washington at sixth place among all states in the percentage of jobs forecast to require a postsecondary education by 2018. Figure 6 shows that 36 percent of all jobs in the state will require a bachelor’s degree or higher.

In its forecast of workforce demand-supply gaps, the WTECB estimates that Washington employers will need a growing number of workers with postsecondary education and training, including an additional 10,000 individuals with bachelor’s degrees and 9,000 with graduate degrees, annually by 2019.⁹⁷

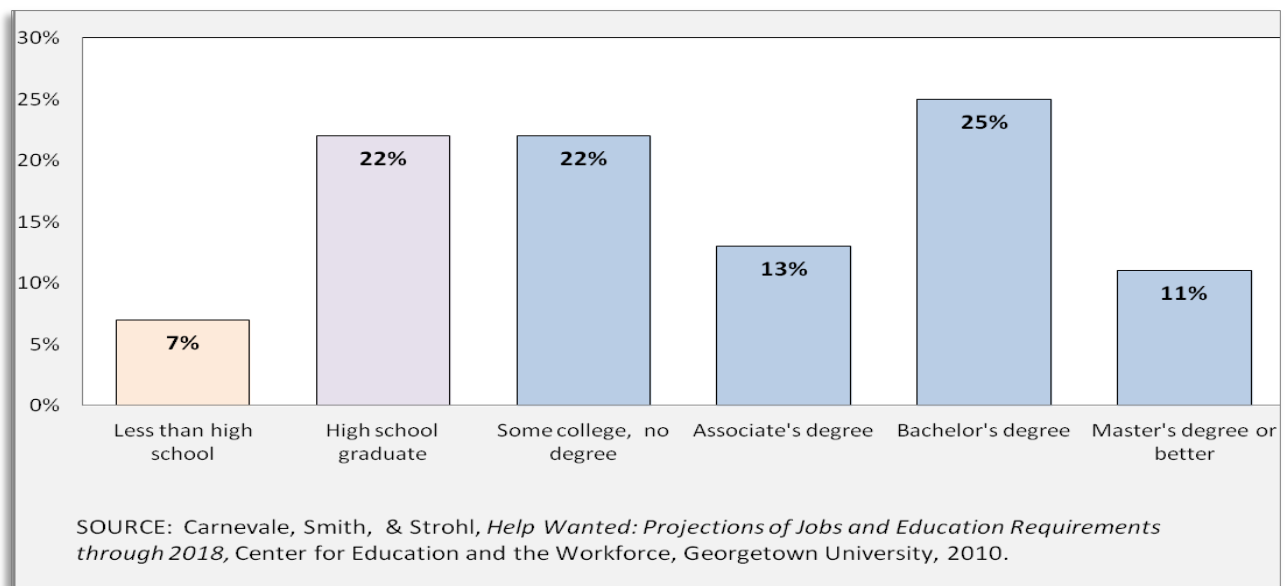


Source: Carnevale, 2012.

Figure 5. Changes in Jobs by Education Level in Washington State

⁹⁶ Carnevale, A., et al., *Help Wanted: Projections of Jobs and Education Requirements through 2018*, Center for Education and the Workforce, Georgetown University, 2012:
<http://www9.georgetown.edu/grad/gppi/hpi/cew/pdfs/State-LevelAnalysis-web.pdf>

⁹⁷ WTECB, *A Skilled and Educated Workforce: 2011 Update*:
<http://www.wsac.wa.gov/sites/default/files/SkilledEducatedWorkforce2011.pdf>



Source: Carnevale, 2012.

Figure 6. Distribution of Education Requirements for All Job Openings in Washington by 2018

GRAPPLING WITH MISUNDERSTANDING

Although the evidence of the importance of a college education is clear, a quick look at editorials and news articles about education and the economy illustrates the deep division among Americans on this goal. Many believe that "college education" only means a four-year baccalaureate degree. And many people believe that the Bachelor of Arts/Bachelor of Science is the sole goal of the "college for all" movement. They fear that not all students can or want to reach that goal and that emphasizing it will leave some students feeling less attached to secondary education and unwilling or unable to learn about other postsecondary options.

In contrast is the viewpoint that most four-year college degrees today are too generic, lacking the specialized training and applied focus required by employers for many technical and professional occupations. Other critics of "college for all" are quick to point out that many highly skilled and well-paid occupations do not require a bachelor's degree. Others who share this view point to the rapidly rising costs of higher education and the escalating load of student debt as arguments against pushing higher education for all.

These and other arguments about the role of workforce education divide many education analysts, policy makers and employers. Too many people, however, are not hearing the whole

message. After at least two decades of discussions about the opportunities in high-tech certificated jobs, "college" has come to mean the wide range of education and training outcomes that involve postsecondary classrooms, educators, certificates and degrees.

The real sweep of postsecondary education in the U.S. is vast, encompassing baccalaureate research universities, liberal arts colleges, community and technical colleges, technical degree and certificate programs, and the booming private education and training sector. Because the vast majority of these programs include attendance at a campus or a program that is partnered with a postsecondary institution, such as many apprenticeship programs, **"college" more accurately means those postsecondary education and training programs that require a level of educational preparation and performance beyond that required for a high school diploma.**

This simple definition of a "college education" should be something everyone can accept. It helps to accentuate the evidence that even college exposure of a year is a significant step – indeed, a tipping point – along the qualification and wage ladder. The evidence in favor of more college for more people should:

- Portray the effort to get students into postsecondary learning environments as a broadly accepted public policy goal, and
- Encourage educators and education policy makers that the goal of college attendance is a valuable one.

MORE FLEXIBLE POSTSECONDARY EDUCATION

Not all adults need to be convinced of the importance of skills gained in the postsecondary system, and yet they do not use the system. The traditional postsecondary system fails some workers because, at its core, it assumes the student is able to focus full-time on classroom-based education. But many workers need to seek immediate employment, so they turn to short-term training that can address pressing needs. Such training will rarely provide the learner with the depth needed for a stable career *unless* the training enhances essential and foundational skills by also connecting learners to an integrated continuum of education and training.

Even short-term training often means time out of the workplace to participate in classroom-based programs. This is often an economic hardship for trainees, most of whom are adults in need of a regular income. For job seekers and newer workers, classroom-based learning often means taking the low-paying job at hand rather than investing in longer-term training.

Further, many people prefer learning experiences that focus directly on the skills required for a specific occupation. They often require education as well as training, but they prefer an emphasis on application and worksite learning. The apprenticeship model is the best-known approach for combining immediate employment with skills learned on the job, in-depth technical knowledge, hands-on skills and continual access to retraining.

ADULT LEARNERS

Many colleges and universities have offered "adult learning" options for decades and, recently, many more have begun degree programs focused specifically on meeting the needs of adult learners.⁹⁸ These schools are embracing adult learners to enhance the economic competitiveness of their regions with minimal expense. Their efforts are supported by academic research that verifies the importance of adult learners in the future workforce.⁹⁹ Successful programs approach adult learners differently than they approach younger students, applying insights about the principles of teaching and learning specifically for adults, referred to as "andragogy" ("pedagogy" refers to the learning of children).¹⁰⁰

It is critical that an employers' workforce development goals and strategies address the principles of andragogy used for adult learners. Adult learners are defined by their characteristics more than by their age. Their chief attributes include:

- Self-motivation
- Curiosity about learning
- Extensive work and life experiences
- Critical thinking skills
- Aptitude for learning in groups

⁹⁸ Many baccalaureate programs began recruiting adult learners in the 1970s. A survey by the University of California, Berkeley, in 1972 found approximately 1,400 two- and four-year colleges offering degree programs they considered "non-traditional" because they primarily served adult learners through evening or correspondence programs. See: Lyman A. Glenny, "The 60s in Reverse," *The Research Reporter*, v. 8, #3, p. 1-4.

⁹⁹ *Returning to Learning: Adults' Success in College is Key to America's Future*, Lumina Foundation, 2007: <http://www.luminafoundation.org/publications/ReturntolearningApril2007.pdf>.

¹⁰⁰ The distinction between "child" and "adult" is not simply age. It is characterized by attributes of the learner. The young learner is assumed to need an educator who makes decisions about what to learn and how content should be delivered. The student demonstrates mastery of content in assessment designed by the instructor. Adult learners neither require nor desire that level of educator direction. See: Malcolm Knowles, *The Adult Learner: A Neglected Species*, 3rd edition, Houston: Gulf Publishing, 1984; John Sperling, founder of Phoenix University, *Against All Odds*, Phoenix: Apollo Press, 1989; J.E. Kemp, G. R. Morrison, and S.M. Ross, *Designing Effective Instruction*, 2nd edition, Upper Saddle River, New Jersey: Pearson, 1998; *Distance Learners in Higher Education: Institutional Responses for Quality Outcomes*, C. Gibson, editor, Madison, WI: Atwood Press, 1998, pp. 65-76; D. Mackeracher, *Making Sense of Adult Learning*, Toronto University Press, 2003.

- Capability for reflection and introspection
- Capacity for self-directed learning
- Ability to apply and articulate their perspectives as interactions with course content

Adults enter education with a wide range of these skills, and it is precisely because they come with these attributes that exposure to a “traditional” education environment – with an educator-director and a basis in theory and research – often feels like a poor fit. Still, most adults need assistance to help them learn and require education and training that is tailored to their needs. Fortunately, studies of adult learning are burgeoning and there is a rich literature upon which to draw. Learning styles research, for example, indicates the importance of providing multiple teaching, learning and assessment models for adult learners.¹⁰¹

This focus on how adults learn has ramifications for where and when they can learn and where, when and how to deliver training as well as broader education.¹⁰² For colleges and other training institutions, responding to adult learning needs is also a critical strategy for sustainability because adults readily seek out learning environments that best fit their lifestyle and developmental needs.

To be effective, the hoped-for increase in the number of college graduates must coincide with an enhanced understanding of the essential elements of postsecondary education. Educators at all levels need to understand the importance of education that includes:

- **Intellectual knowledge:** Knowing how to learn, study, research and use intellectual knowledge. It encompasses a core understanding of science and mathematics, the social sciences and humanities, language and the arts, and communication and information literacy. It also includes the skills of inquiry and critical thinking, and the ability to focus with rigor on questions great and small.
- **Practical skills:** Including the soft skills of teamwork and collaborative problem solving, as well as the skills needed to engage socially, both locally and globally. These skills include civics, ethics and multicultural competence.
- **Integrative learning:** Putting the pieces of intellectual and practical knowledge to use requires the ability to synthesize at general and specific levels, demonstrate

¹⁰¹ Kim Buch and Susan Bartley, "Learning Style and Training Delivery Mode Preference," *Journal of Workplace Learning*, v. 14, no. 1/2, 2002; Kemp, et al., op. cit.

¹⁰² Another important aspect of what we know about adult learners will be how young learners are being changed by their early and continual exposure to information. How this will affect pedagogy and, eventually, andragogy, will be important for workforce policy makers and practitioners to follow.

knowledge, and adapt knowledge and skills to new uses, new settings and new questions.¹⁰³

When more students have access to education and training enriched with these elements, and have the support to master these skills, more workers – and more businesses – will be well-equipped for the innovative workplace.

INCREASE ONLINE, APPLIED AND OTHER NON-TRADITIONAL METHODS OF DELIVERY

ONLINE LEARNING SITUATIONS

Online learning presents an important opportunity to expand the delivery of postsecondary education to more students in more regions of the state. The Internet provides a powerful vehicle for disseminating course content, and students and employers are demanding that postsecondary institutions adapt and expand program offerings to address myriad personal and professional circumstances. For instance, many students want to start academic and technical college programs in their own communities. Some will seek to continue college online, on their own time, or while working if their employer supports it. Employers generally view online options as an efficient tool for employee development that helps minimize the costs associated with offsite travel or training that happens during regular work hours.

Not all educational content can be delivered effectively online, especially if the demonstration and practice of applied knowledge – as is typical of most apprenticeships – is a priority. But the use of online modules and “blended” learning programs offers huge advantages in cost and convenience to students, employees and employers in virtually all industries and occupations. The question is no longer whether postsecondary education should make use of online learning tools, but how quickly and effectively their use can be expanded and adapted to meet the requirements of users who now expect it. Determining the role higher education plays in helping Internet users educate themselves is a critical frontier for workforce development in an innovation economy.¹⁰⁴

¹⁰³ Multiple discussions on the importance of resurrecting and redirecting the traditional college core curriculum abound, as do discussions about reconciling technical and intellectual education. See Debra Humphreys, “Making the Case for Liberal Education: Responding to Challenges,” Association of American Colleges and Universities, 2010: http://www.aacu.org/leap/documents/LEAP_MakingtheCase_Final.pdf.

¹⁰⁴ Example of this discussion: Vivek Wadhwa, “Dear Peter Thiel: Let’s Fix College, the Right Way,” *Mashable*, 7/4/2012: <http://mashable.com/2012/05/30/peter-thiel-college/>. Wadhwa is vice president of Academics and Innovation at Singularity University, Fellow at Stanford Law School and Director of Research at Pratt School of Engineering at Duke University.

APPLIED LEARNING SOLUTIONS

Employers need a workforce that possesses specific technical skills and underlying theoretical knowledge of the industry, so an applied learning approach that integrates both elements is appropriate. *Applied learning* represents instruction in both hands-on application and theory-based knowledge. This approach is not new; it has been the core strategy of effective professional, apprenticeship and vocational programs for generations. But applied learning principles and strategies are evolving in the electronic age and the new economy. Digital tools make learning more portable, so "classrooms" move to the student and among worksites. Online learning is often combined with applied learning strategies, creating blended learning opportunities that can offer effective educational outcomes and convenience for youth and adults alike.¹⁰⁵

In an innovation economy, however, simply matching specific job skills and basic theoretical concepts may be insufficient, no matter how elegantly, digitally or conveniently the content is delivered. Succeeding in a globally competitive environment also means employees will be expected to have a higher educational foundation. Acquiring the higher-level skills needed to support an innovation economy – creativity, inventive thinking and flexibility – will rest, in part, on how well we underscore and demonstrate the acquisition, comprehension and rigorous application of theoretical knowledge.

The knowledge bar has already risen in a number of key industries, occupations and skill levels. Manufacturing, for example, is among the many industries that spent the last two decades defining skills and knowledge for its occupations and creating certifications to confirm skill attainment. Manufacturing relies on organizations such as the National Institute for Metalworking Skills (NIMS), the Manufacturing Skill Standards Council (MSSC) and the American Welding Society (AWS) to provide skill assessments and credentials. These organizations generally address theoretical knowledge and the demonstrated application of skills. For example, in order for a worker to successfully complete NIMS certification, he or she must produce a quality part (hands-on demonstration) and pass an exam to verify knowledge (theory and application).¹⁰⁶

The ability to combine professional and business skills with academic knowledge is just as critical when graduate-level academic skills are required. By the 1990s, only 20 percent of U.S.

¹⁰⁵ U.S. Department of Education, *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies*, Office of Planning, Evaluation and Policy Development, 2010: <http://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf>.

¹⁰⁶ "About NIMS", National Institute for Metalworking Skills, Inc., 2005: www.nims-skills.org/about/about.htm.

students who earned a bachelor's degree in mathematics or science went on to graduate study. (And that 20 percent generally pursued academic research and teaching as their career.) Yet, higher skills in mathematics and science were becoming increasingly more critical to STEM industries. Several universities, aided by private funding, began to address the issue by developing Professional Science Master's (PSM) degree programs.

In 2009, the American Recovery and Reinvestment Act (ARRA) provided \$15 million through the National Science Foundation to promote and expand these new PSM degree programs to more institutions and disciplines. According to the Council of Graduate Schools, there are now 291 programs in 126 institutions with over 25,000 students, including one in Washington (in molecular biology sciences at WSU). Programs generally combine two years of academic instruction in a STEM field – often the same academic classes attended by Ph.D. students – but instead of undertaking independent research and preparing a thesis, students add interdisciplinary study that is heavy on business and communications skills and engage in internships in the industry for which they are preparing.¹⁰⁷

EVOLVING FOUR-YEAR INSTITUTIONS

While workforce policy usually focuses on sub-baccalaureate programs, higher education has an important role to play. Beyond the fact that many employers view four-year degree holders as qualified in a specific subject area, many of the foundational skills needed in an innovation economy – the ability to think critically, use information technology, analyze and understand data, and communicate effectively – are taught in most baccalaureate programs. Moreover, many of the highly skilled, in-demand technical degrees that have been identified as essential to support the growth of innovation are products of the extensive theoretical and technical instruction typically provided by four-year institutions.

Engineering is perhaps the discipline most commonly mentioned when focusing on innovation, but there continues to be large gaps between supply and demand in engineering programs and occupations across the state. Engineering is also the leading field for which companies recruit temporary foreign workers to fill these gaps. Nationally, STEM occupations account for almost two-thirds of requests for H-1B workers. Healthcare, finance, business and life sciences occupations are also in high demand.¹⁰⁸

¹⁰⁷ See www.sciencemasters.com for additional information, including a guide to establishing new programs.

¹⁰⁸ The Brookings Institute, *The Search for Skills: Demand for H-1B Immigrant Workers in U.S. Metropolitan Areas*, 7/2012: <http://www.brookings.edu/research/reports/2012/07/18-h1b-visas-labor-immigration#overview>.

In response, the University of Washington (UW) and WSU are investing \$3.8 million to increase engineering enrollments by 29 percent, which should lead to 380 additional engineering degrees annually. (Currently, approximately 800 engineering students graduate from UW each year and 520 from WSU.) As the *Seattle Times* noted, additional capacity is needed to increase degree production in engineering to boost the development of local high-tech talent:

*(S)trategic investment in engineering is needed to capitalize on an important and underused talent pipeline... Without growth in in-demand programs, the UW and WSU would be forced to continue turning away qualified students because there aren't enough slots. About half of the students who successfully complete the prerequisites for an engineering major at the UW can't get into the engineering program. Both schools will target some of the money toward computer-science and computer-engineering degrees, another area where qualified students are turned away."*¹⁰⁹

Unfortunately, both universities have made these investments by reducing funding in other departments due primarily to the state's prolonged budget crisis. This may be a detriment to students in non-STEM disciplines that are also critically important to growing an innovation economy, such as the arts and design, sociology and psychology, business, law and history. Indeed, few courses of study do not have the potential to enhance the knowledge, skills and flexibility of the future workforce in ways that can stimulate and support innovation.

ENCOURAGE UNIVERSITY/BUSINESS PARTNERSHIPS IN HIGHER EDUCATION

To reach the goal of increasing the education and skills of the innovation workforce, the connections among the institutional layers of our educational system must improve, from the early grades through postsecondary education. And these connections must include all of the different educational disciplines and options available in our state.

But despite ongoing efforts to connect these layers, the institutions that deliver secondary, sub-baccalaureate (including apprenticeship and postsecondary skills training), four-year and post-graduate programs continue to operate somewhat independently, especially in terms of workforce development.

New higher education-industry partnerships are needed to forge stronger relationships among industry, employer groups and the full range of education partners and programs that can help stimulate and support the state's innovation economy. The state should identify and provide in-depth study of partnerships that are known for their ability to promote the academic

¹⁰⁹ "Boosting Engineering Programs Invest in State Economy," *Seattle Times* editorial, 5/5/2012: http://seattletimes.nwsources.com/html/editorials/2018262947_edit23engineering.html?prmid=obinsite.

learning of students while imparting technical skills and experience in the industry. These programs should differ from workforce development efforts intended for skills certifications, both in their academic rigor and the time required to complete them.

Washington's two-year colleges are home to several well-known Centers of Excellence that are organized in support of these goals. In addition, the college system has begun to expand four-year applied baccalaureate degree programs that provide higher-level knowledge and skills in a number of disciplines that boost the state's capacity to support innovation. Effective models from other postsecondary systems and institutions may also offer appropriate and instructive examples for Washington's four-year colleges and universities.

These new partnerships also make possible renewed support and more widespread use of work-based learning opportunities, in which applied learning principles, career exploration experiences and direct exposure to the workplace through experiential learning can help confirm for students the qualifications and knowledge required in the careers they are interested in.

Establishing new, closer relationships that focus on innovation and workforce development can also affect a stronger bond among students and employers. An equally important outcome is an enhanced and closer relationship among education and training institutions and their primary customers: students and industry. These tightened connections can help ensure that our education and training institutions keep up with industry's needs, and are better-positioned to *anticipate and react* more nimbly and more effectively to changes in the state's evolving innovation economy.

Further, greater involvement of colleges and universities can help bridge programs and campuses, help ensure full utilization of the latest research and, in turn, develop research in new practices. The University of Wisconsin – Milwaukee, for example, created a Center for Workforce Development (CWD), calling the university a "workforce intermediary." The CWD focused on convening discussions; implementing career development, preparation and placement tools not always found on campus; and enlarging the university's activism in workforce development.¹¹⁰

¹¹⁰ Sammis White and Jennifer Rigganbach, "The University as Workforce Intermediary: UWM's Center for Workforce Development," University of Wisconsin–Milwaukee: http://www.cael.org/pdfs/57_theuniversityasworkforceintermediary. CWD serves largely as a WIB-like center, providing counseling and short course skill sessions, pairing businesses with workforce assets. The university realizes indirect benefit to its traditional mission, "CWD also gives the university another vehicle for being involved in regional economic development. The chancellor actively participates in a new regional economic development initiative. CWD is assisting the initiative, the Milwaukee 7, to learn more about the specific

Finally, expanded involvement by colleges and universities in business partnerships can help bridge ongoing economic hardships that have caused continued budget cuts, and related programmatic constraints facing all of Washington's postsecondary institutions today. Initiating or expanding opportunities for faculty to work on projects in an industry setting, for instance, provides invaluable professional development experiences to upgrade content knowledge and skills, and develop industry connections that also benefit students. Inviting industry to identify current employees as potential adjunct faculty can help infuse expertise and new knowledge and technologies into college courses, classrooms and labs. Donations or shared use of industry lab space, equipment and technical expertise can help keep college and university programs current, ensuring that students and faculty have access to state-of-the-art technologies that many institutions can ill-afford to buy on their own.

EXPANDED APPRENTICESHIP

Although the term "apprenticeship" often refers to a casual mentor-like relationship between a skilled worker and a new hire, the Registered Apprenticeship system administered through the U.S. Department of Labor and state apprenticeship council is centered on formally defined public-private partnerships. Registered apprenticeships begin with agreements that:

- Define specific occupations and delineate the required skills of the trade;
- Determine training content, length and assessment methods; and
- Set a graduated pay rate for trainees as their skills progress.

In many ways, establishing an apprenticeship parallels skill standards work, which identifies critical skills and the level of essential competency. Establishing apprenticeships is an excellent way to codify and preserve the essential skills of retiring workers and launch the training of their successors. The apprenticeship training system also supports life-long learning. In the traditional trades, once an apprentice graduates to journey worker status, additional skill upgrades are always available, benefitting both employers and workers as their industry evolves.

employers in the region, the challenges they face, and the potential solutions the region should employ. The payoff for the university is not only the publicity from being an active player in regional efforts, but it **also gives the university an active role in shaping many endeavors that will influence the supply of students, the demand for various majors, and a lead role in the ladder of education options that is needed as the region moves further into the knowledge economy**" [emphasis added].

Recent studies that looked at the effectiveness of the registered apprenticeship model in the U.S. found that apprentices had higher earnings than non-participants.¹¹¹ This was true particularly for those who completed the apprenticeship program, but also for those who participated for a limited time. Over a career, workers who participated in registered apprenticeship programs had an average estimated earnings gain of \$98,718 (\$123,906 with employer benefits). And for those who completed the program, the average earnings gain was substantially higher: \$240,037 (\$301,533 with employer benefits). In the same study, a cost-benefit analysis concluded that the benefits accruing from apprenticeships substantially exceeded the costs to provide these programs.

These same impressive outcomes apply to Washington's apprenticeship programs which, in 2011, had over 12,500 active participants.¹¹² On measures such as employment, earnings and employer satisfaction, the outcomes for apprenticeship completers far outpaced either non-completers or members of a non-participant control group.¹¹³

Expanding apprenticeship opportunities makes sense in an era of global competition. It is one of the staples of workforce development in Europe. In Germany, Austria and Switzerland, for instance, apprenticeship is major part of education options for 16 to 19 year olds. Apprenticeship in those nations is considered an attractive alternative to university education, and the two tracks are quite separate. Apprenticeships are lucrative and attractive: over two-thirds of young Germans and Swiss, and 40 percent of young Austrians, enter apprenticeships. Apprenticed occupations include all economic sectors, including manufacturing, construction and transportation, but also liberal arts-related professions and social/human services.

¹¹¹ Jessica Zeigler, et al., "The Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States," Mathematica Policy Research for the U.S. Department of Labor, Education and Training Administration, 7/31/2012. The study examined registered apprenticeships (RAs) in 10 states selected for their variety of program features and labor market characteristics, including program size, region, the degree of union representation in the state, administrative type (federal or state), and the degree to which RA is concentrated in a few occupations. The states are Florida, Georgia, Iowa, Kentucky, Maryland, Missouri, New Jersey, Ohio, Pennsylvania and Texas. See: http://wdr.doleta.gov/research/FullText_Documents/ETAOP_2012_10.pdf.

¹¹² WTECB, *Workforce Training Results*, 2011: <http://www.wtb.wa.gov/Apprenticeship2011Dashboard.asp>.

¹¹³ Ibid. For employment, 81 percent of completers were employed, as reported to the Employment Security Department during the third quarter after leaving the program, compared to 61 percent for all participants (completers and non-completers combined). Completers earned \$56,509 in median annualized earnings six to nine months after leaving the program; for all participants, the median earnings were \$38,235. All completers combined earned over \$17,654 more than the control group of non-participants in average annualized earnings, measured 9 to 12 quarters after leaving the program. Finally, 93 percent of employers reported satisfaction with new employees who were program completers. See: http://www.wtb.wa.gov/Documents/2_Apprenticeship_2011.pdf.

In France, Netherlands and the United Kingdom, which have an apprenticeship system blended with the university system, about half of those under age 22 seek an apprenticeship to learn a skilled trade. In the U.S., this number is under 4 percent.

The European systems are not perfect, and much of the division that occurs between technical and academic education is not an outcome that should be sought in the U.S. The British are engaged in improving their blended system while the Germans are working to update their apprenticeships to accommodate the rapid changes occurring in their industries. Overall, however, the European approach to ensuring that all youth are prepared for employment has merit, and efforts should be made to adapt some elements of this model for the nation and Washington state.¹¹⁴

ENSURE THE CREATIVE CLASS HAPPENS

While the need for skilled workers at a high-tech company seems obvious, there is more to their need than targeted technical skills, particularly when a company is engaged in critical research and development and faces fast-changing competition. Creativity, flexibility and inventive thinking are vital in these jobs, too. The argument advanced by workforce and economic analysts, such as the ITIF, is that skilled technical workers contribute to an innovation factor that is becoming increasingly important to the economic health of nations. Competitive rewards arise from:

- Being the initiator in creating new customers, especially in new exports. According to the Upjohn Institute, new exports lead to twice as many new jobs as expansion in domestic sales.¹¹⁵ Within an industry, a 10 percent increase in sales due to exports leads to a 7 percent increase in employment; in contrast, a 10 percent increase in domestic demand leads to just a 3.5 percent increase in employment.
- The frequent spread of new technologies and products into other industry sectors, as happened with information technology. This brings expansion of both direct and indirect jobs.
- The associated rise in productivity that often results from innovation, and which then drives higher wages and lower prices that, in turn, expand markets.

¹¹⁴ Hilary Steedman, *Apprenticeship in Europe: Fading or Flourishing?* Center for Economic Performance, London School of Economics, 12/2005.

¹¹⁵ Lori Kletzner, *Imports, Exports, and Jobs*, Upjohn Institute, 2002.

How important is innovation to Washington? The state's most innovative companies produce products and services that are marketed globally, generating over \$64 billion in total export revenues (2011).¹¹⁶ Over 40 percent of total exports in 2011 came from sales in aerospace manufacturing, including associated high technology and parts suppliers. Accelerating growth of export markets in high technology, clean energy, and through the research and development of innovative new products is a state economic development priority that is a prominent topic in state strategic planning.¹¹⁷

But growth in the innovation economy cannot be sustained without the support of workforce talent at all levels. According to the projections for Washington state by the Center on Education and Workforce at Georgetown University, a skilled workforce is critical to supporting and expanding the state's lead in several industries (see Addendum 1). Companies will likely continue to import talent to fill job gaps as needed to support innovation. But continued reliance on, or expansion of, this strategy due to anticipated labor shortages could detract from efforts to solve the systemic challenges associated with developing the state's domestic labor force. Washington must continue to examine how best to develop the state's labor force of the future. That means looking at our education and workforce development system as an integrated whole, beginning with a strong foundation in primary education.

EDUCATE FOR JOBS AND THE FUTURE

Unemployment problems are complicated by the mismatch between the skills possessed by available workers and the skills required for available jobs. This appears to be particularly true in the technical/professional jobs that require certificates or some college education, but not a degree.¹¹⁸ These include many jobs in several expanding industries, including information technology and healthcare. Many new workers seek to enter these occupations through programs offered at community and technical colleges, but many of these programs have not been able to meet student demand; some struggle to prepare non-traditional and minority workers for these jobs. Meanwhile, even though the available labor pool has grown due to the recession, employers continue to report specific skill gaps among available applicants.

¹¹⁶ U.S. Department of Commerce, U.S. Census Bureau, *State exports for Washington*, 2011: <http://www.census.gov/foreign-trade/statistics/state/data/wa.html>.

¹¹⁷ Washington Clean Energy Leadership Council, *Washington State Clean Energy Leadership Plan Report*: http://washingtoncelc.org/filestore/CELC_Navigant%20Final%20Report_Final.pdf. Also: Washington Economic Development Association, *Building a world class innovation ecosystem*, Draft, 5/2012: <http://www.wedc.wa.gov/Download%20files/2012StrategicPlanDraft.pdf>.

¹¹⁸ *A Skilled and Educated Workforce 2011 Update*, Joint Report of the Higher Education Coordinating Board, SBCTC and WTECB: www.wtb.wa.gov/sites/default/files/SkilledEducatedWorkforce2011.pdf.

One constraint to matching labor supply and demand is the overall decline in state resources, which is negatively affecting the availability of education and training across the board. But in an era of declining resources, another question is whether we are doing enough to target training that matches the demands of the economy.

In Michigan, a workforce policy that started in 2007 called No Worker Left Behind offered two years of free tuition toward in-demand associate degrees. Initially, the program reported that 72 percent of its 62,000 participants found or retained employment, a success rate that has drawn considerable attention. By 2010, 150,000 workers were enrolled. But despite this success, budget cuts have forced enrollments to be curtailed in the past year. However, this program continues to assist those already enrolled with an emphasis on long-term training.¹¹⁹

Washington has also been working to direct education and training funds to projected high-growth, high-demand industries and to specific activities that directly support employers and employees. One example is the Job Skills Program (JSP), which provides training funds to help employers develop or retain workers, especially those who may be at risk of losing their jobs due to technological or economic changes.

The JSP served 42 companies and 2,902 incumbent workers between July 1, 2010 and June 30, 2011. Over \$2.7 million of state funds were invested to deliver specialized trainings through community and technical colleges and other vendors that required a 1:1 funding match by participating employers. Last year, 24 of the 34 funded projects taught employees about a variety of contemporary manufacturing principles, including lean manufacturing, value stream mapping, continuous process improvement and Six Sigma principles.¹²⁰ These projects are instructive because they focus specifically on the delivery of knowledge and skills that are foundational, transferrable to many industries and work environments, and applicable for workers in occupations at many levels.

¹¹⁹ Tom Hilliard, *Leaving No Worker Behind: Community Colleges Retrain the Michigan Workforce – And Themselves*, Jobs for the Future/Breaking Through/Achieving the Dream, 5/2011.

¹²⁰ SBCTC, *2011 Job Skills Program: Report to the Legislature*, 12/2011: <http://www.sbctc.ctc.edu/college/workforce/JSPReporttoLeg-2011.pdf>

THE MOST IMPORTANT "NEW" SKILL: LEARNING TO LEARN

The primary goal for those who will survive in the new economy seems to be "learning to learn," which encompasses the specific skills of flexibility and innovation.¹²¹ It is vital that a worker in a rapidly evolving workplace is able to:

- Learn on the job through regular retraining or continuing education,
- Learn how to diagnose one's own need for learning, and
- Learn how to be a self-learner.

This type of learning enables students to continue learning with greater effectiveness – a particularly important skill given the accelerating growth in knowledge and technology.¹²²

For some workers, learning to learn means being able to see what skills are going to be needed and acquiring the skills that will be in demand. This need is most strongly associated with adult workers whose employers rely on the public education system to provide the training needed to cultivate workers with the desired skills. For these workers, self-skilling – that is, remaining in command of their own skill set – is critical to continued employability. Younger workers may find this continual learning quite normal because they are often surrounded by co-workers who act as free agents, as is common in IT, or are employed in fields that require licensing and continual skill updates to remain qualified in their professions, such as many healthcare workers and educators.

For many employees, particularly those with negotiated contracts, continual learning may not have been customary when they began their employment. The process may seem intrusive and unfair – a requirement imposed by a never-satisfied employer. Many of these workers may have very specific skill sets, perhaps reinforced by their contracts. Many may not have enjoyed school. They may have entered employment at or before graduating from high school, or they may have undergone extensive training targeted to specific jobs and do not feel the need to acquire a wide set of industry skills that are transferrable to other jobs, employers or industry sectors. More importantly, they may never have developed the skill of "learning to learn" if they left school early or learned through narrowly focused skill training.

¹²¹ P. Toner, *Workforce Skills and Innovation: An Overview of Major Themes in the Literature*, OECD Directorate for Science, Technology and Industry, Centre for Educational Research and Innovation, 2011: <http://www.oecd.org/science/innovationinsciencetechnologyandindustry/46970941.pdf>.

¹²² K. Wirth and D. Perkins, *Learning to learn*. Macalester College, 2008: <http://www.macalester.edu/geology/wirth/learning.pdf>.

The recession caused many businesses to reduce their training investments dramatically, making it even harder for employees to get comprehensive training directly through their employers.¹²³ For those workers lucky enough to have employers with formal training programs (delivered in-house or taught through a local college or training center), employees need "only" be willing to invest time and effort in a retraining or skills enhancement program.

Some employers support skills training during work time because they know that the time a worker invests in training is a shared investment that provides mutual benefits. Boeing is a good example. In addition to directly providing formal training to employees so they can excel in their jobs, meet customer requirements and comply with government regulations, Boeing's *Learning Together* program provides funding for tuition and related expenses to any employee who wants to pursue educational opportunities that enhance job performance and skills improvement.¹²⁴

Not every employer underwrites training as Boeing does, let alone subsidizes tuition and other educational costs. Beyond the availability of training and continuing education resources, however, is the fundamental issue of how adults learn. To address this, we must first determine why some employees resist or resent continual learning while others embrace it.

Employers who prefer employees with at least some college success seek workers who they assume have the ability to learn and who are internally motivated to pursue new knowledge and skills. Some employers, like Boeing, find it worthwhile to invest heavily in a workforce that is continually reskilling to meet the evolving, long-term needs of the organization. For other employers, targeting internally motivated learners may represent the need – or preference – for workers for whom learning is an active process that is viewed as natural and ongoing, and for whom it is inherently self-directed.

SUPPORT LEARNING AND PLANNING

Many students entering college or training programs must also have institutional support that goes beyond tuition for instructional programs. They must be able to find or continue the kind of career guidance that helps them evaluate and select the best classes, programs and even institutional options. As one professional association notes, failing to match student

¹²³ Workforce.com, *Training is Taking a Beating in Recession, Studies Find*, 2011:

<http://www.workforce.com/article/20090126/NEWS01/301269979/training-is-taking-a-beating-in-recession-studies-find>.

¹²⁴ Boeing, U.S. Benefits Overview: http://www.boeing.com/careers/benefits/us_benefits.html#educational.

aspirations with the realities of the workplace usually results in negative outcomes for students:

*Most of these [career] choices require a number of years of postsecondary education, yet only 70 percent of students graduate from high school on time, and only 34 percent graduate ready for college. This disconnect between aspiration and educational performance sets students up for personal and financial disappointment as they are faced with the realities of the job market.*¹²⁵

PROVIDE MORE SUPPORT FOR WORKERS WHO SEEK NEW SKILLS

The early discussion considered how to help students stay in school, transition to postsecondary opportunities and learn in a variety of ways. The focus in that section was on preparing students for initial employment and sustaining learning during their subsequent careers. But it is equally important that the education system considers the needs of workers who may have worked before but dropped out of the K-12 or postsecondary systems. These workers may not need new skills to *get* employed, but often seek to learn new skills so they can keep learning and advancing. Many workers who try to gain missed skills through educational recapture or workforce training programs find that many options allow only short-term training so they have to find another means to gain next-step skills. Many of these workers fall through wide gaps between programs. The seamlessness of transfer along the educational/work skills path must be improved, including continued academic skill development when needed.¹²⁶

Further, a vital flaw in many workforce development approaches, amplified perhaps by the emphasis on placement outcomes, is the limited to non-existent support for post-training workers. Students increasingly question being forced into decades of indebtedness to reach professional and technical goals. Washington needs to identify and implement ways to provide lower-skilled adults with more support to succeed in education. More intensive and sustained college and career coaching, and more help with meeting the costs of upgrading their skills, both direct (such as tuition, books and fees) and indirect (such as living expenses, child care

¹²⁵ Association for Career and Technical Education, *Career and Technical Education's Role in Career Guidance*, Issue Brief, 12/2008, p.2:
https://www.acteonline.org/uploadedFiles/Publications_and_Online_Media/files/Guidance_issuebrief.pdf.

¹²⁶ Discussion of need and options for addressing the challenges of providing skills to those outside the mainstream academic and workforce tracks include many focusing on minority workers, often with higher dropout and unemployment rates. See Victor Rubin and Ruben Lizardo, *Pathways Out of Poverty for Vulnerable Californians: Policies that Prepare the Workforce for Middle-Skill Infrastructure Jobs*: www.policylink.org.

and transportation) is needed. Wisconsin's Opportunity Grants are a leading example of these efforts.¹²⁷

Spending more money to support workers seeking skills is not simply an issue for lower-skilled workers. The compelling issue of financial aid for students throughout the education and workforce system must be met to reach the very first goal: produce more workers with more skills. Their success is not only personal; it is shared across the economy. When students of all types succeed in getting the training and experience they need to perform and contribute to the innovation economy, their achievements reflect the economic success of the industries for which they work and is an investment in the economic future for all Washingtonians.

Evidence is mounting that these two key steps – learning to learn and career guidance – would generate solid returns on workforce education and training investments made by individuals, employers and the state. Fully implemented, comprehensive counseling and guidance programs report that the students they work with have access to more college and career information, are more targeted in their course selection, reach higher levels of academic achievement, have higher grades, and feel that their education has better prepared them for their future.¹²⁸

¹²⁷ Although the program has ended, a brief description of their intent is available here: http://dwd.wisconsin.gov/dwd/newsreleases/2010/100622_oppgrant_ec.pdf.

¹²⁸ C. Sink, *An Investigation of Comprehensive School Counseling Programs and Academic Achievement in Washington State Middle Schools*, ASCA Professional Counselor, 10/2008. Also: Richard Lapan, Norm Gysbers and Yongmin Sun, "The Impact of More Fully Implemented Guidance Programs on the School Experiences of High School Students: A Statewide Evaluation Study," *Journal of Counseling & Development* 75: 292-302, 1997. See also: Jennifer Cromley, *Learning to Think, Learning to Learn: What the Science of Thinking and Learning Has to Offer Adult Education*, 2001: http://literacynet.org/resources/cromley_report.pdf.

CONCLUSION: WHAT SHOULD BE DONE NEXT?

As this paper has demonstrated, Washington's many workforce assets must be preserved and expanded to ensure Washington businesses remain competitive globally and all Washington residents contribute to – and share in – its economic prosperity. The innovation economy that Washington is building will require a highly skilled, highly creative workforce. Throughout this paper we have illustrated the kinds of changes that are needed and that must be addressed with urgency. These recommended actions are summarized below.

RAISE THE SKILLS OF THE CURRENT WORKFORCE

To address the immediate needs of the unemployed and underemployed, those with too few or outdated skills, and to fill the immediate needs of Washington's employers, Washington should improve its current workforce development structure, policy and programs. The evidence suggests that Washington's current workforce is under-skilled for existing and developing opportunities. Many of those displaced in the recession will not find new employment without additional training. Even today's incumbent workers are at risk if their skills do not expand.

To address the rising skill demand, Washington should upgrade its current workforce system in several ways. Washington's tripartite leadership should be maintained, as well as state workforce development planning and many of its successful initiatives, but much of the system needs improvement to meet the needs of an innovation economy. Specifically, the state should:

- Continue industry-specific and regional workforce initiatives, but ensure that business and worker representatives from the innovation economy are actively involved. The businesses that expanded even in recession and those emerging most strongly in the new economy must be an integral part of workforce policy and delivery.
- Convene an inclusive conversation about joint public and private responsibilities for the workforce system. This is new, critical territory: how can the public and private sectors share responsibility for training and education that meets business needs in an era of government contraction?
- Improve the system's flexibility and responsiveness to the rapid changes in an innovation economy. Washington should investigate other states' and nations' models for applicability in Washington.
- Emphasize information technology skills, increasingly essential to employment. Individual efforts to help the unemployed and incumbent workers gain higher skills must become more consistent and more universally available.

- Reconsider the outcome measures employed for workforce training for the innovation economy. While this work has been initiated in Washington, it must become a central part of the state's assessment of workforce development efficacy.

CREATE THE NEXT WORKFORCE FOR THE INNOVATION ECONOMY

While Washington's current workforce needs assistance, service to those workers must not come at the cost of reduced education and training for the next generation of workers. The future of the state rests with the workers it educates and trains now for business opportunities in the future.

To create the workforce Washington will need, its education and workforce systems must align and operate more cohesively, and college must be more accessible for more people.

Washington should:

- Continue the effort to improve the quality of Washington students' basic education, which serves as each individual's educational foundation. Tough economic times must not be allowed to erode progress.
 - Continue – and enhance – the efforts to include all kinds of Washingtonians at all levels of education.
 - Expand use of work-based learning, service learning and other delivery methods as a means of inclusion.
 - Expand career planning at all levels of education to help individuals navigate the education and workforce systems.
- Improve the flexibility and responsiveness of postsecondary education and training opportunities.
 - Address the unique needs of adult learners, including increased opportunities for applied learning and online learning options to expand participation.
 - Evolve academic programs at all levels to address the learning and workforce development needs of the innovation economy.
 - Encourage industry-education partnerships at all levels and in more disciplines.
 - Expand apprenticeship opportunities.

In the end, this change is about making sure that workforce development encompasses the entire range of education and training in the public sector. It must include sub-baccalaureate programs and degrees, but it cannot remain relegated strictly to them; to be effective, Washington's workforce development system must be truly comprehensive in scope and in practice.

ENSURE THAT THE CREATIVE CLASS HAPPENS

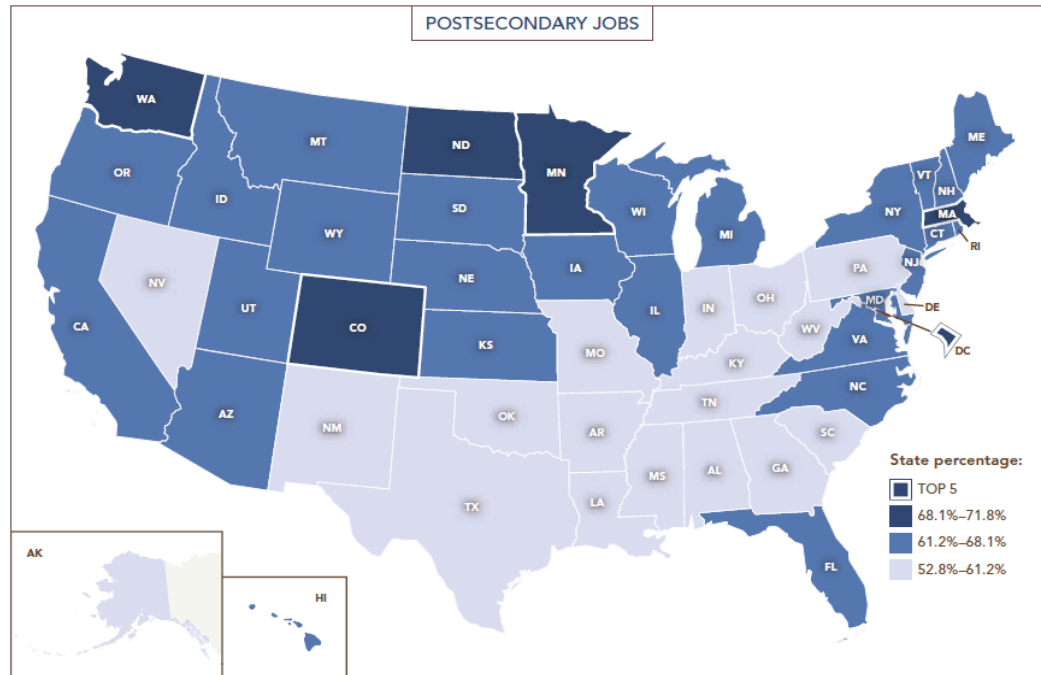
Not only must the concept of workforce development become more expansive, it must also deepen. Building a workforce to support the innovation economy means applying innovation to workforce development itself. Washington's workers must have more than a single set of discrete skills; they must be flexible and able to think, analyze and create. This will require new and more complex policies and programs to:

- Educate for jobs now and for the future.
- Emphasize the most important new skill: Learning to Learn.
- Support learning through effective planning, career information and support for students and workers.

These are tasks critical to ensuring that Washington supports and expands its economic advantages. The system today contains substantial gaps that leave workers without marketable skills and employers with unmet labor needs. No single activity can satisfy the sundry ways in which Washingtonians prepare for and advance in the workforce, but the state can do more to ensure opportunities for learning that address our current and future needs.

ADDENDUM 1

DISTRICT OF COLUMBIA, MASSACHUSETTS, COLORADO, MINNESOTA, AND WASHINGTON WILL LEAD THE NATION IN JOB OPENINGS REQUIRING POSTSECONDARY EDUCATION BY 2018.



ADDENDUM 2

Occupations	August 2010	August 2011	Year-over-year change	Average hourly wage
Total	99,331	116,604	17,273	\$23.53
Computer and mathematical	17,928	23,893	5,965	\$40.86
Management	11,078	13,372	2,294	\$53.99
Business and financial operations	4,838	7,070	2,232	\$33.38
Architecture and engineering	3,012	4,243	1,231	\$38.35
Transportation and material moving	3,070	4,282	1,212	\$17.59
Sales and related	11,682	12,580	898	\$18.57
Production	1,909	2,789	880	\$18.80
Office and administrative support	10,293	11,017	724	\$17.43
Installation, maintenance and repair	2,700	3,411	711	\$23.00
Construction and extraction	1,467	2,092	625	\$25.09
Food preparation and serving related	2,961	3,462	501	\$11.83
Arts, design, entertainment, sports and media	2,587	2,982	395	\$24.61
Life, physical and social science	1,592	1,949	357	\$30.97
Building- and grounds-cleaning and maintenance	1,228	1,551	323	\$13.72
Protective service	623	859	236	\$25.17
Education, training and library	1,710	1,939	229	\$24.18
Personal care and service	1,577	1,759	182	\$13.35
Legal	512	691	179	\$40.82
Farming, fishing and forestry	138	184	46	\$14.57
Community and social services	1,318	1,340	22	\$20.91
Other/un-coded	-1,549	-1,732	-183	N/A
Healthcare support	3,643	3,321	-322	\$15.03
Healthcare practitioners and technical	15,014	13,550	-1,464	\$37.14

Data from Employment Security Department¹²⁹

¹²⁹ <https://fortress.wa.gov/esd/employmentdata/docs/economic-reports/labor-market-and-economic-report-2011.pdf>

