

Vice President's Conversation on the Future

Trend Research: Alignment of Employee Skills with Job Needs

Descriptor Definition

The nature of work and the workforce in Ohio is changing. Employers are concerned about how the training and skill base of current and potential employees fit the changing needs for jobs in Ohio industries and businesses. This descriptor paper focuses on trends related to the changing nature of work and the skills needed; what we know about the “skills gap”; what is being done now; and recommendations on how to address the skills gap in the future.

Authors' Insights¹: Descriptor Relevance

Given the data collected for this project and a survey of the literature, we see general agreement that a significant gap exists between the skills that employers believe are needed for a job and the supply of workers with desirable skill sets to meet the demand. This is a general problem that is not isolated to a few occupations or fields and optimism for a rapid solution is low. While this is a global issue, there are significant implications to individuals, communities, and states that can find solutions to close the skills gap.

Identifying and implementing solutions that work to address the skills gap will lead to a significant competitive advantage in the global marketplace when attracting new business, industry, and workers, as well as having an informed and educated citizenry, conceivably setting a path of success for generations to come. Those who do not make such investments risk falling further behind. Investments in closing the skills gap could have significant impacts on Ohio's ability to manage other future challenges that it will likely encounter, many of which are included in other descriptor papers. Ohio has the resources needed to create a competitive advantage (i.e., human capital, education institutions, business and industry) if they can be refocused and aligned.

Trend Information and Interpretation

The Changing Nature of Work and Skills Needed

Data suggests that the nature of work and the workforce in the U.S. and Ohio are changing with associated concerns about a gap between the skill base of people seeking jobs and the needs of employers (American Society for Training & Development, 2009; Casner-Lotto & Barrington, 2006; Greater Cincinnati Workforce Network, 2010; Secretary's Commission on Achieving Necessary Skills (SCANS), 1991). As we continue the employment shift from goods-producing to service-providing industries, it has been suggested that the skills gap is due to a shift in the mix of jobs within industries and the types of skills that those jobs require (Acemoglu & Autor, 2011; ACT 2011; Autor, Levy & Murnane, 2003). Trying to predict the future related to specific job categories and labor requirements is difficult and many of the past predictions have been proven wrong (Institute for the Future, 2011).



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Rather than focusing on future jobs or particular industries, emphasis on future work skills — proficiencies and abilities required across different jobs and work settings — seems more appropriate.

For most of the 20th Century, the technology of mass production emphasized discipline to the assembly line (SCANS, 1991). Fifty years ago, factory and office workers focused on a single task, using a single machine. The days of predictability and repetitive jobs are fleeting in the new, global economy. Today, the shift to a knowledge and technology-based economy has simplified or eliminated many jobs that involve routine (mentally, physically, or both) tasks. Jobs that are non-routine (requiring problem solving, creativity, critical thinking) and interactive (i.e., teamwork, leadership, and complex communication skills) are increasingly in demand. Non-routine manual labor and service jobs are expected to hold steady (Farrell, et al., 2009; Levy & Murnane, 2006; Partnership for 21st Century Skills, 2002).

Much of the recent literature on workforce skills was influenced by the seminal workforce policy paper, The SCANS Report (1991), which identified key competencies employers want employees to have. Since the SCANS report, a number of authors have described the general skill sets important to employers (ACT, 2011; Casner-Lotto & Barrington, 2006; Greater Cincinnati Workforce Network, 2010; Levy & Murnane, 2006; Partnership for 21st Century Skills, 2002). While this list of skills is constantly evolving, trends have emerged. As the knowledge economy continues to take shape, the types of skills that employers identify (see Table 1) are moving beyond basic skills (e.g., math, reading, and writing) to more applied skills (e.g., problem solving, professionalism, and critical thinking) (Casner-Lotto & Barrington, 2006; Levy & Murnane, 2006).

New Entrants with HS diploma "Very Important" Skills			New Entrants with 2-yr college/tech school diploma "Very Important" Skills			New Entrants with 4-yr college diploma "Very Important" Skills		
Rank	Skill	%	Rank	Skill	%	Rank	Skill	%
1	Professionalism/Work Ethic*	80.3%	1	Professionalism/Work Ethic*	83.4%	1	Oral Communications*	95.4%
2	Teamwork/Collaboration*	74.7%	2	Teamwork/Collaboration*	82.7%	2	Teamwork/Collaboration*	94.4%
3	Oral Communications*	70.3%	3	Oral Communications*	82.0%	3	Professionalism/Work Ethic*	93.8%
4	Ethics/Social Responsibility*	63.4%	4	Critical Thinking/Problem Solving*	72.7%	4	Written Communications*	93.1%
5	Reading Comprehension	62.5%	5	Reading Comprehension	71.6%	5	Critical Thinking/Problem Solving*	92.1%
6	English Language	61.8%	6	Written Communications*	71.5%	6	Writing in English	89.7%
7	Critical Thinking/Problem Solving*	57.5%	7	English Language	70.6%	7	English Language	88.0%
8	Information Technology Application*	53.0%	8	Ethics/Social Responsibility*	70.6%	8	Reading Comprehension	87.0%
9	Written Communications*	52.7%	9	Information Technology Application*	68.6%	9	Ethics/Social Responsibility*	85.6%
10	Diversity*	52.1%	10	Writing in English	64.9%	10	Leadership*	81.8%
11	Writing in English	49.4%	11	Lifelong Learning/Self Direction*	58.3%	11	Information Technology Application*	81.0%
12	Lifelong Learning/Self Direction*	42.5%	12	Diversity*	56.9%	12	Creativity/Innovation*	81.0%
13	Creativity/Innovation*	36.3%	13	Creativity/Innovation*	54.2%	13	Lifelong Learning/Self Direction*	78.3%
14	Mathematics	30.4%	14	Leadership*	45.4%	14	Diversity*	71.8%
15	Leadership*	29.2%	15	Mathematics	44.0%	15	Mathematics	64.2%
16	Foreign Languages	11.0%	16	Science	21.2%	16	Science	33.4%
17	Science	9.0%	17	Foreign Languages	14.1%	17	Foreign Languages	21.0%
18	Government/Economics	3.5%	18	Government/Economics	6.7%	18	Government/Economics	19.8%
19	History/Geography	2.1%	19	Humanities/Arts	4.4%	19	History/Geography	14.1%
20	Humanities/Arts	1.8%	20	History/Geography	3.6%	20	Humanities/Arts	13.2%
*	Indicates an applied skill		*	Indicates an applied skill		*	Indicates an applied skill	

Source: Casner-Lotto & Barrington, 2006

When basic knowledge and applied skills rankings are combined across educational levels, the top five “most important” are almost always applied skills, with Professionalism/Work Ethic, Teamwork/Collaboration and Oral Communications leading the list (Casner-Lotto & Barrington, 2006).

Work tasks (and the skills needed to perform them) have become a better predictor of employment and wage growth than either educational level or occupational title (Farrell, et al., 2009). Workers are expected to continuously update their knowledge and skills to keep up with the rapid pace of change (Cochran & Ferrari, 2009). The rapid evolution of technology is driving an ever faster need to change, innovate, and learn new skills for workers at all levels in organizations.

Predictions by The Institute for the Future (2011) suggest the trend will continue - that the basic skills in the future will require critical thinking and problem solving, adapting previous knowledge and skills to new and novel contexts. Future Work Skills 2020 identified 10 skills for the future workforce including: Sense-making, Social Intelligence, Novel & Adaptive Thinking, Cross-Cultural Competency, Computational Thinking, New-Media Literacy, Transdisciplinarity, Design Mindset, Cognitive Load Management, and Virtual Collaboration. These skills appear to support the trend described above, with a focus on applied, cognitive, non-routine skills.

Authors' Insights

The skill of lifelong learning seems to bear major importance as a critical skill for success in the future workforce. While perhaps not borne out as significantly in the research presented, perhaps this skill is not as easily observed by employers and as such was underreported. A quote by Toffler as cited in Partnership for 21st Century Skills (2002) sums up the importance of lifelong learning well:

“The illiterate of the 21st century will not be those who cannot read or write, but those who cannot learn, unlearn, and relearn.”

Whether routine or non-routine, the workforce of the future will need to have adaptable skill sets like critical thinking and problem solving skills or risk being replaced by others or technology. If we look at work by economists Murnane and Levy, The Partnership for 21st Century Skills, and futurists thinking about the issue, all point to high functioning skills and, while exciting to think about, also introduce a sense of trepidation regarding the ability of many to transcend to such skill levels based on the current skills gap. Industries that have these types of jobs will increasingly demand a greater share of the skilled workforce as more routine jobs are replaced by technology. At the individual level, those who do not develop applied skills as described above will be at a severe disadvantage. At the aggregate level, it is clear that the basic skills of the future will involve both what we *called* basic skills in the past (e.g., reading, writing, and science) and what we *may call* basic skills in the future (e.g., teamwork, critical or adaptive thinking, and virtual collaboration).

What Do We Know About the Skills Gap?

A simple definition for the skills gap is that it is a measure of the difference between the skills needed for a job versus those skills possessed by a prospective worker (ACT, 2011). Such a definition requires that we have a clear understanding of the skills employers need and a way to assess the skills of

prospective workers. In the previous section we shared the skills that employers say they need. So how are workers stacking up?

A recent report from the McKinsey Center for Government suggests there is a problem and it is global in nature. Mourshed, Farrell, & Barton (2012) surveyed employers, education providers, and youth in nine countries to learn more about the skills gap. Globally, 39% of employers said a skills shortage is a leading reason for entry-level vacancies and 36% reported that lack of skills caused “significant problems in terms of cost, quality and time” (Mourshed, Farrell & Barton, 2012). Employers in the U.S. were less optimistic with 45% reporting a skills shortage as a leading reason for entry level vacancies. A report titled *Are They Really Ready to Work?* provided more insight into workforce readiness in the U.S. (Casner-Lotto & Barrington, 2006).

Casner-Lotto and Barrington (2006) found High School Graduates were “deficient” in the basic knowledge and skills of *Writing in English, Mathematics, Reading Comprehension, Written Communications, Critical Thinking/Problem Solving, Professionalism/Work Ethic*, and “adequate” in three “very important” applied skills: *Information Technology Application, Diversity, and Teamwork/Collaboration*. Two-year and four-year college graduates were better prepared than high school graduates for the entry-level jobs they fill, but still “deficient” in *Writing in English, Written Communications, and Leadership* (Casner-Lotto & Barrington, 2006). More recently, the Society of Human Resource Managers (2013) found more than half (57%) of human resource managers said applicants were lacking basic math skills, with another 46% cited “writing in English” as a deficiency. More than four in 10 HR professionals (41%) said applicants lacked “English reading comprehension” skills.

The skills gap in Ohio is no different. In a study conducted by the Greater Cincinnati Workforce Network (2010), “Over one-third of employers indicate that it is somewhat difficult or very difficult to find qualified workers for current job openings, while half of employers expect difficulty in the future.” These same employers indicate being dissatisfied with 25% or more of the majority of new hire skills and competencies (see Table 2).

Table 2		
Employer Satisfaction with New Hire Skills and Competencies		
New Hire Skills & Competencies	Very Satisfied & Satisfied	Somewhat Dissatisfied and Very Dissatisfied
Workplace Competencies		
Teamwork	76%	24%
Flexibility	74%	26%
Customer focused	74%	26%
Organization	64%	36%
Problem solving	59%	41%
Understands industry language	65%	35%
Follows directions	78%	22%
Appropriately dressed	62%	38%

Table 2 cont'd		
Personal Effectiveness		
Integrity	77%	23%
Communication	66%	34%
Takes initiative	53%	47%
Willingness to learn	83%	17%
Dependability	55%	45%
Time management	56%	44%
Academic Competencies		
Reading	83%	17%
Writing	59%	41%
Mathematics	69%	31%
Basic computer skills	78%	22%
<i>Source: Greater Cincinnati Workforce Network (2010)</i>		

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A skills gap is not surprising. Worker skills will always lag in relation to employer demand. The current concern is about the pace and scope of the issue and the particular skills that are in demand and the ability, or inability, of the system to close the gap. A gap in basic skills such as reading, writing and math coupled with challenges in professionalism or personal effectiveness is a cause for concern. If workers do not have basic academic and professional skills then it makes it nearly impossible to succeed in a workplace demanding the “new basic” skills of critical thinking, problem solving, teamwork, and complex communication.

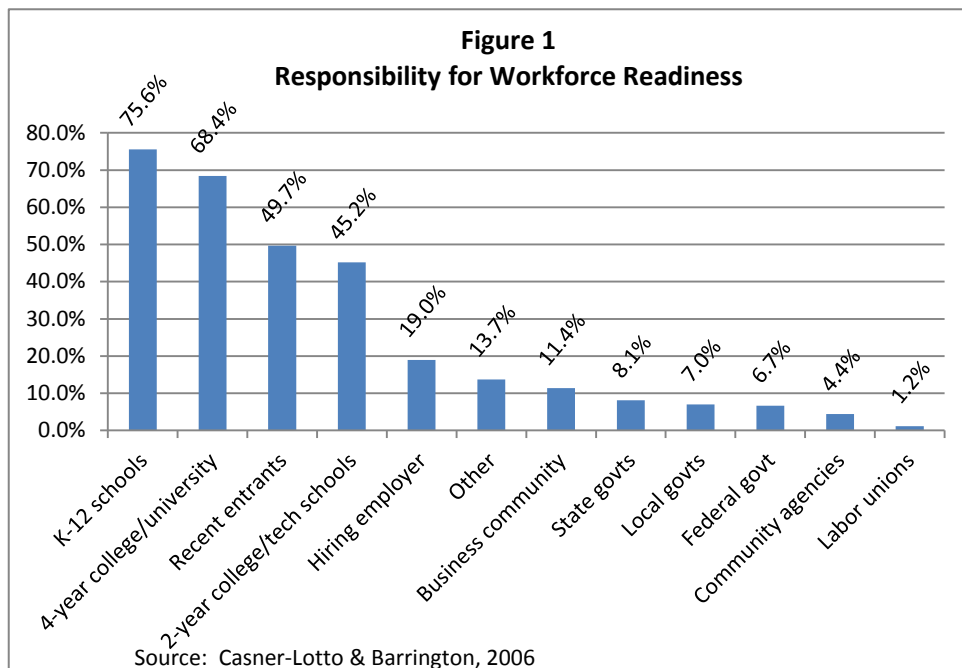
Another potential area of concern we see emerging relates to professionalism/work ethic - a skill ranked in Table 1 by 83% to 93% of employers as very important - and generational differences. There appears to be a disconnect between employers and millennials regarding professionalism in the workplace. The perception is that millennials dress casually, want to work when they want to work, and require regular recognition and reward for meeting basic expectations. This seems to directly conflict with employers' current needs. In fact, professionalism could be a critical modifying factor in our ability to bridge the skills gap, but not unless professionalism gets a new definition or millennials adapt to the current definition. It could be argued that professionalism may be more critical to focus on in the short term than critical thinking and problem solving. Who is helping students develop these professionalism skills? We are not sure they are getting them from home or school as consistently or clearly as they need to be successful.

Finally, while not borne out in our research, finding employees who can pass initial screening requirements appears to be an issue as well. This trend appeared both in the initial conversations of this initiative and through multiple human resource manager reports and is taking a toll on employers. Employers are finding it increasingly challenging to find hireable workers. Significant numbers of applicants fail to pass drug and background checks, drop out of the process, or don't even apply due to past criminal history. Increasingly, organizations and human resource professionals are faced with the challenge of finding enough applicants who meet minimum qualifications and are far from meeting

expectations related to higher level skills. In the least, employers are spending significant time and dollars in recruitment and training to meet their needs.

What Is Happening to Address the Skills Gap?

In an effort to address the skills gap, key players have to be involved and engaged. This is a multi-faceted issue with many constituencies and stakeholders. Looking at broad categories, we can identify employers, education providers and the actual workers as key partners. Skills training takes many forms and is provided by many different stakeholders including secondary schools, vocational schools, higher education, employers, industry associations, and government at the local, state or national level (Mourshed, Farrell & Barton, 2012). Employers surveyed by Casner-Lotto and Barrington (2006) placed primary responsibility on K-12 and higher education for workforce readiness (see Figure 1.)



While we may have ideas on who the key partners are, another concern are the disconnects that exist between these groups on how prepared graduates are to work. Mourshed, Farrell and Barton (2012) asked stakeholders about general readiness of graduates for the job market. While employers (42% agreed) and youth (45% agreed) seem to have a similar view, education providers (72% agreed) are far more optimistic, indicating a significant systemic challenge. Growing concern is also developing on the value of post-secondary studies with less than half (44%) of recent graduates in the U.S. believing post-secondary studies have helped their employment opportunities.

This is particularly concerning as Ohio is slipping behind in educational attainment while most employers require at least some post-secondary work. Ohio ranked 24th in the percentage of those 25

and older who were high school graduates in 2007 and lags the nation and most states in postsecondary education attainment. About 33% of Ohioans ages 25 and older have an associate degree or more, which is below the national average of 39%. Ohio ranked 38th in the percentage of those with a bachelor degree or more (Ohio Job & Family Services, 2009).

Ohio saw the skills gap coming and its implications. A 1998 report by the Ohio Business Roundtable and Ohio Department of Education contained strong language related to the skills gap.

The skills of Ohio's emerging labor force do not match the current skill demands of Ohio's workplaces. Too many job candidates are unable to read instruction manuals, complete simple forms, or apply fundamental mathematical and scientific principles to work-related problems. Too many Ohio companies are spending valuable training dollars on basic reading and mathematics skills for their workers... Too many Ohio communities lack enough skilled workers to attract new businesses. **This "skill gap" is Ohio's greatest economic challenge**, and it is a challenge that is shared by...educators, parents, employers, labor, and public officials, equally. And we know when we have to get the job done - the future is now.

(p. 5-6, Ohio Business Roundtable and Ohio Department of Education, 1998)

Nearly fifteen years later the skills gap remains and is receiving new attention in Ohio. In 2012, the Ohio Governor's Office of Workforce Transformation was created with the primary goal being to create a unified workforce system that supports business in meeting its workforce needs (Ohio Governor's Office of Workforce Transformation, 2014).

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While the key stakeholders, the critical skills, and the importance of the skills gap are known, it remains challenging to demonstrate success on a broad level, in Ohio or nationally. Quantifiable gains are challenging to identify. A fragmented approach to training and developing worker skills has not worked. Placing sole responsibility for the solution on employers, educational institutions, or individual workers has caused the skills gap to increase and a systems approach is needed to make positive change.

"The problem, then, is not that success is impossible or unknowable—it is that it is scattered and small scale compared with the need." P. 20 (Mourshed, Farrell & Barton, 2012).

What about our future workforce? With millennials weighing their investments in higher education with greater scrutiny due to a depressed job outlook and rising higher education costs, the workforce may lag even further behind in filling holes created by boomers leaving the workforce. This could put a significant strain on the future workforce in Ohio. Employers and education providers need to work together to help students identify potential careers, particularly in high demand and growth industries.

Recent adoption of the Common Core State Standards for K-12 education by a majority of the states, including Ohio, may have a positive impact on closing the skills gap due to the emphasis on rigor, problem solving, and critical thinking. With many school districts just beginning integration and implementation of the Common Core, it is too early to tell if gains made will significantly impact the

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skills gap. It should be noted that Ohio is not alone in implementing Common Core so it would be expected that Ohio will not hold exclusive rights to significant gains, but gains overall could increase the position of the U.S. in a competitive global marketplace.

Overall Summary of Trend Information

As the knowledge economy continues to take shape, the types of necessary skills that employers identify are moving beyond basic skills (e.g., math, reading, and writing) to more applied skills (e.g., problem solving, professionalism, and critical thinking). Predictions for the future suggest this trend will continue and include more and more complex, non-routine skills. A fragmented approach to training and developing worker skills has not worked. Placing sole responsibility for the solution on employers, educational institutions, or individual workers has caused the skills gap to increase and a systems approach is needed to make positive change. Ohio has an opportunity to create a competitive advantage on a global scale if it can successfully address the skills gap and supply a skilled and professional workforce.

Author Insights - Alternative States for the Future

Looking out to the year 2035, we propose three possible outcomes related to alignment of employee skills with job needs. Probabilities of occurrence are estimations (given the information available and knowing it will likely change) that provide a starting point for conversations about the future.

- A. Systems align, at least in high growth/need industries. The skills gap decreases overall due to improved post-secondary educational attainment and general skill development aligned with employer needs and/or in-migration of skilled workers. Ohio's position in the global marketplace improves. Based on 2014 trend information, this outcome appears to be the least likely with an a priori probability of 0.15.
- B. A skills gap will continue to remain at roughly the same level. The skills needed may change slightly. Systems will remain disconnected. Some industry sectors make gains related to human capital, others fall behind depending on ability to partner/secure skilled workers. Ohio's position in the global marketplace remains stable. Based on 2014 trend information, this outcome appears to be the most likely with an a priori probability of 0.60
- C. Systems remain disconnected, not seeking solutions, taking no action. Past history indicates this is likely but new efforts might serve as a needed catalyst. The skills gap widens due to lower post-secondary educational attainment, out-migration of skilled workforce, fewer job opportunities (companies move out or don't come), inability to support "new basic" applied skill development. Responsibilities for skill development remain focused solely on education providers and disconnects remain. Ohio's position in the global marketplace decreases. Based on 2014 trend information, this outcome appears to have an a priori probability of 0.25.

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¹ Along with the research-based data and statistics included in this document, is information provided by the research paper author(s). Although these author insights are not directly cited with research references, they reflect research, observation, logic, intuition, and well-considered expectations compiled by the author(s). The Author Insights sections of this paper are offered for discussion and to help provide a wider perspective for incorporating the descriptor data into the possible future trends. These conclusions are drawn by the author(s) using their knowledge of the scholarly references and their years of professional experience related to the descriptor, and are provided to help the reader more effectively envision the future impact and effects of the descriptor.

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