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Workforce Readiness and the New Essential Skills

- A rapidly changing global business environment is creating demand for a highly skilled workforce.
- HR professionals, employers and the American public are concerned that the future U.S. workforce is not prepared for more intense global competition for high-skilled jobs.
- The mismatch of business needs and available skills could lead to significant challenges in managing the future workforce.

It isn't difficult to argue the importance of workforce development to an HR professional. The impact of failed education policies, a lack of access to and affordability of higher education and a disconnect between business needs and the existing skills of the labor pool all directly influence the ability of HR to do its job. But the lack of a skilled and educated workforce does more than simply frustrate a nation's HR community; it has a direct bearing on the country's economic future.

Research findings show that U.S. HR professionals and employers are unsatisfied with the skills of new entrants to the workforce and concerned that the future workforce will not be able to compete on the global stage. Research has also shown that there is strong consensus among the U.S. public that the skills, competencies and behaviors that young people will need for the future are different from those that may have prepared previous generations of workers. While there appears to be recognition of the problem and the need for change, finding local solutions to this global challenge is a complicated task.

The HR profession must be actively involved in finding these solutions. HR professionals operate at the point where the requirements of the business meet the realities of the available labor pool and therefore have valuable insight into where the gaps are between business needs and the skills of the workforce. This insight places responsibility on HR professionals to play a leading role in creating answers to workforce readiness issues within their organizations and their communities.

The new essential skills

Both employers and the general public agree that the kinds of skills that current students will need to succeed in the workforce of the future are very different from those that served previous generations. And both employers and the general public appear to be concerned that the educational experience of today's young people has not evolved enough to take them to the level needed in order to compete in a much more aggressive global economy. This situation will not only put young American entrants to the labor market at a disadvantage as they compete with other young people around the world for the best skilled jobs, it will also put U.S. employers at a disadvantage as they compete for market share in a global knowledge-based economy through the skills, knowledge and talent of their workforce.

This transition to a global knowledge-based economy, which values very different skills from those that were sufficient to secure a good job in previous generations, is the subject of countless business books and articles. There appear to be two main ways of looking at these new essential skills. The first emphasizes the intensification of global competition and the need for more highly developed skills, especially in the areas of math and science. This line of thought focuses on how technology has eliminated the geographic barriers that once protected knowledge-based, white-collar jobs. In this "flat world," competition is fierce and is based not so much on new types of skills but rather on the *level of excellence* workers reach within existing skills areas. The second view posits that we are moving into an age where entirely *new sets of skills* that call on right-brained, conceptual ways of thinking will become much more important than the more analytical skills that dominated the information age. Whereas the first position emphasizes the need for *better* skills, the second emphasizes *different* skills.

Though these approaches to the new essential skills for workforce readiness are not exactly the same, the evidence suggests that, in some sense, both are probably right. Global comparisons show that there is a strong need to improve U.S. students' skill levels within existing knowledge domains, especially math and science. But changes in the economy also indicate that the development of new aptitudes that emphasize more creative and conceptual skills will also be important to building a competitive national workforce.

> There is concern that the United States is falling behind global competition in preparing young people for the jobs of the future.

Falling behind global competition

The main drivers of concern about the workforce readiness of both new entrants to the labor force and the future U.S. workers who are currently students tend to be factors that are influenced by global competition, such as the need to improve productivity, encourage innovation and find and retain the most highly skilled workers. Employers, workers, parents and students are all concerned that the United States is falling behind global competition

Table 1 | U.S. Students Perform Below Average Compared With Other Industrialized Countries

	U.S. MEAN	OECD AVERAGE	AVERAGE OF BEST FIVE PERFORMERS
Reading	495	494	530
Science	491	500	537
Mathematics	483	500	538
Problem solving	477	500	542

Source: Learning for Tomorrow's World (OECD, 2003); Education at a Glance (OECD, 2006)

in preparing young people for the workplace and economy of the future.

For example, 42% of the U.S. voters surveyed in the 2007 Partnership for 21st Century Skills' *Beyond the Three Rs: Voter Attitudes Toward 21st Century Skills* report believe that other developed countries are doing a better job than the United States in preparing their young people for 21st century jobs. The 2006 *Are They Really Ready to Work?* survey report, conducted by the Society for Human Resource Management (SHRM), the Conference Board, Partnership for 21st Century Skills and Corporate Voices for Working Families, found that employers are also very concerned about the skill levels of new entrants to the workforce, especially those with only a high school diploma or GED equivalency: 42.4% of employers in the survey felt that new entrants to the workforce with these qualifications were "deficient" in their skills and work readiness. A January 2008 survey of HR professionals conducted by Softscape, a human capital software company, found that a staggering 94% of human resource professionals do not feel that their workforce is adequately prepared to meet the future goals of their organization. The number one driver behind this concern was the need to retain skilled staff, followed by finding top talent and developing future leaders.

Comparative studies of student performance in industrialized countries indicate that these concerns about the workforce readiness of the future U.S. workforce are well-founded. Studies from the Organization for Economic Co-operation and Development (OECD), an international body made up of the world's wealthiest and most developed countries, consistently show U.S. students underperforming compared with their international counterparts. Recent studies also show that U.S. students are not performing as well as students from many less developed emerging economies. The Programme for International Student Assessment (PISA) is a triennial survey of the knowledge and skills of 15-year-olds conducted through a collaboration between participating countries and the OECD. It is one of the largest international surveys of student knowledge that is used to develop valid comparisons across countries and cultures. A 2007 OECD working paper *Primary and Secondary Education in the United States* observed: "Determining what school students can and should learn is difficult. Accordingly, international comparisons provide a useful and interesting benchmark. Unfortunately, the performance of U.S. students in international tests is not especially good." Despite very high investments in education compared with other OECD countries, U.S. students in the PISA test perform only around the OECD average in reading and below average in science, math and problem solving (Table 1).

Despite very high investments in education, the performance of U.S. students in international tests is below average in science, math and problem solving.

The studies of U.S. students are similar to international comparative studies of adults on literacy and numeracy. Here also, the U.S. scores are weaker than the OECD average. Larger-scale surveys that look beyond the wealthy and industrialized OECD countries are no more encouraging. For example, more than 400,000 students

Table 2 | U.S. Students Perform Below Average in International Comparisons of Science Knowledge

COUNTRY	MEAN SCORE	COUNTRY	MEAN SCORE
Finland	563	Switzerland	512
Hong Kong-China	542	Macao-China	511
Canada	534	Austria	511
Chinese Taipei	532	Belgium	510
Estonia	531	Ireland	508
Japan	531	Hungary	504
New Zealand	530	Sweden	503
Australia	527	Poland	498
Netherlands	525	Denmark	496
Liechtenstein	522	France	495
Korea	522	Croatia	493
Slovenia	519	Iceland	491
Germany	516	Latvia	490
United Kingdom	515	**United States**	**489**
Czech Republic	513		

Statistically significantly above the OECD average
Not statistically significantly different from the OECD average
Statistically significantly below the OECD average

Source: Adapted from *PISA 2006 Science Competencies for Tomorrow's World* (published 2007)

from 57 countries, making up close to 90% of the world economy, took part in the most recent PISA in 2006, which focused on the important and competitive area of science. This study included many emerging and even developing economies in addition to the OECD participant countries. But even within this much broader comparison, the United States was not one of the high-scoring nations (Table 2) and scored well below emerging economic powers (and major offshoring destination countries) such as China, Korea and several Eastern European nations.

The low performance of U.S. students compared with students in other countries is not new, but it is, in many ways, counterintuitive. The United States invests much more into education than many countries with higher average PISA scores, and American students enjoy other advantages such as a comparatively well-educated population and higher incomes than many of the countries that outperform the United States. The findings are also counterintuitive given the very high international standing and performance of U.S. universities, not to mention the nation's position as one of the world's most technologically advanced and economically successful economies.

What could be behind this apparent paradox of consistently low average U.S. student test scores compared with other countries, juxtaposed with the United States' success as a center of excellence in higher education and a leader in technological innovation and economic growth? One possible clue is found in the PISA scores for science. Though the U.S. mean score is below average, the percentage of students performing at the highest level, grade 6, was higher for U.S. students (1.5) than for higher overall ranking Estonian and Korean students (1.1). Though this percentage was below those of the other top-ranking countries such as Finland, Canada and Hong Kong-China/Chinese Taipei, it does indicate that the problem may, to a large extent, be one of variance between the highest and lowest performing students.

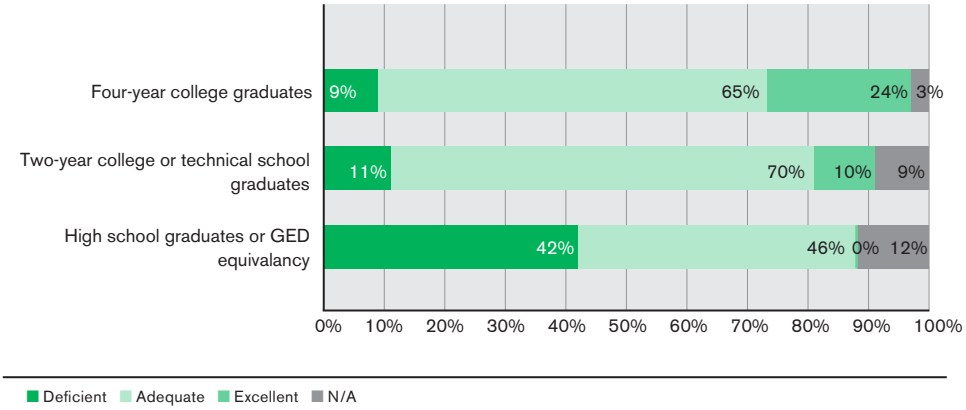
To put it another way, America's best students are comparable to the best in many other industrialized nations, but its average and below-average students perform well below comparable students in other countries. This may be why the United States is able to produce enough high-performing students to fill its internationally well-regarded higher education system, which also benefits from attracting the brightest students from around the world. It may also be why employers report much higher levels of dissatisfaction with high school-only graduates compared to college-educated workers (Figure 1). These kinds of findings indicate that in order to remain competitive, the United States needs to do much more to help boost the reading, math, science and problem-solving skills of its average students.

This approach emphasizes raising skill levels within existing knowledge domains, especially math and science, rather than producing whole new sets of skills. However, there is also evidence that new kinds of skills, not as easily measured through comparative testing such as PISA, will also be needed.

Beyond the basics

These new essential skills do not negate the need for substantial improvement to basic skills in reading, math and science. But there is a growing recognition that economic innovation will increasingly be driven by creativity, communication and new ways of approaching and solving problems, especially through collaborative working and the use of technology. The 2007 study conducted by the Partnership for 21st Century Skills found that a nearly unanimous percentage of the U.S.

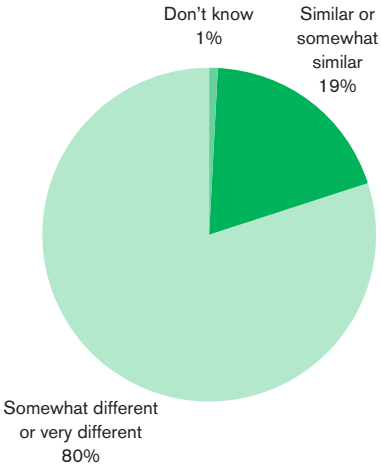
Figure 1 | Preparation Level of Workforce Entrants



Note: Number of respondents varied for each question, ranging from 401 to 423. N/A was selected when company did not hire in selected category. Percentages may not add to 100% due to rounding.
Source: Society for Human Resource Management, the Conference Board, Partnership for 21st Century Skills and Corporate Voices for Working Families. (2006). *Are they really ready to work? Employers' perspectives on the basic knowledge and applied skills of new entrants to the 21st century workforce.*

Figure 2 | Necessary Skills Today Compared With 20 Years Ago

To be prepared for the jobs of the 21st century, do you think the kinds of things a student needs to learn in school are very similar, somewhat similar, somewhat different or very different from what a student needed to learn 20 years ago?



Source: Partnership for 21st Century Skills. (2007). *Beyond the three Rs: Voter attitudes toward 21st century skills.*

Employers are placing more emphasis on applied skills such as critical thinking, teamwork and creativity.

voters surveyed—99%—agreed that teaching students a wide range of "21st century skills," such as critical thinking and problem-solving skills, computer and technology skills, and communication and self-direction skills, will be essential to the ability of the United States to compete economically in the future. The survey also found that most Americans believe that the kinds of skills that students needed 20 years ago are very different from the skills that are needed to compete today (Figure 2). Almost three-quarters of respondents believe that schools should place an equal emphasis on basic skills and these more applied "21st century skills."

Employers also appear to be placing more emphasis on applied skills. In the *Are They Really Ready to Work?* survey mentioned previously, employers were asked about the knowledge and skills they think will increase in importance over the next five years. Though basic skills were still found to be very important, the skills expected to increase most in importance were applied skills, such as critical thinking and problem solving, information technology application, teamwork and collaboration, creativity and innovation, diversity, and leadership (Table 3).

While both employers and the public believe that applied skills have become as important as basic skills, neither group appears to feel that these skills are being adequately taught to new entrants to the workforce. Few of the skills that were considered most important in the Partnership for 21st Century skills study on voter attitudes were considered to be taught at a high level of excellence (Figure 3).

In his book *A Whole New Mind,* Daniel Pink characterizes these kinds of skills as right-brain centric or "R-directed thinking." He names the six new essential aptitudes as:

- ***Design***, or the ability to shape products, services and the environment through the combination of utility enhanced by significance.
- ***Story***, or the ability to place facts within a context that delivers them with emotional impact.
- ***Symphony***, or the ability to put together pieces and see relationships between seemingly unrelated facts.
- ***Empathy,*** or the ability to imagine what it is like to be in someone else's position and to be able to intuit what that person is feeling.
- ***Play***, which manifests itself through games, humor and joyfulness.
- ***Meaning,*** or the global transition away from materialist values toward priorities that emphasize self-expression and quality of life.

Several of these aptitudes move well beyond the realm of applied skills and into the area of emotional and, some might argue, spiritual intelligence. But this is part of the idea; as analytical skills are increasingly outsourced either via technology or through low-cost labor in other parts of the world, more conceptual, less analytical abilities become the aptitudes that give an individual, business or even economy a competitive edge. Pink calls this transition the move from the Information Age to the Conceptual Age, an age where individuals possessing creativity, empathy, the ability to understand connections and generate meaning will begin to dominate the economy through the products and services their ideas engender.

Table 3 | Applied Skills Dominate Rankings of Knowledge and Skills Employers Expect to Increase in Importance Over the Next Five Years

RANK	BASIC KNOWLEDGE AND APPLIED SKILLS	PERCENTAGE
1	Critical thinking/problem solving	77.8
2	Information technology application	77.4
3	Teamwork/collaboration	74.2
4	Creativity/innovation	73.6
5	Diversity	67.1
6	Leadership	66.9
7	Oral communications	65.9
8	Professionalism/work ethic	64.4
9	Ethics/social responsibility	64.3
10	Written communications	64.0
11	Lifelong learning/self-direction	64.0
12	Foreign languages	63.3
13	Mathematics	48.8
14	Writing in English	45.4
15	Reading comprehension	41.0
16	Science	38.7
17	English language	32.8
18	Government/economics	24.8
19	History/geography	17.9
20	Humanities/arts	9.5

Source: Society for Human Resource Management, the Conference Board, Partnership for 21st Century Skills, Corporate Voices for Working Families. (2006). *Are they really ready to work?* United States: Authors.

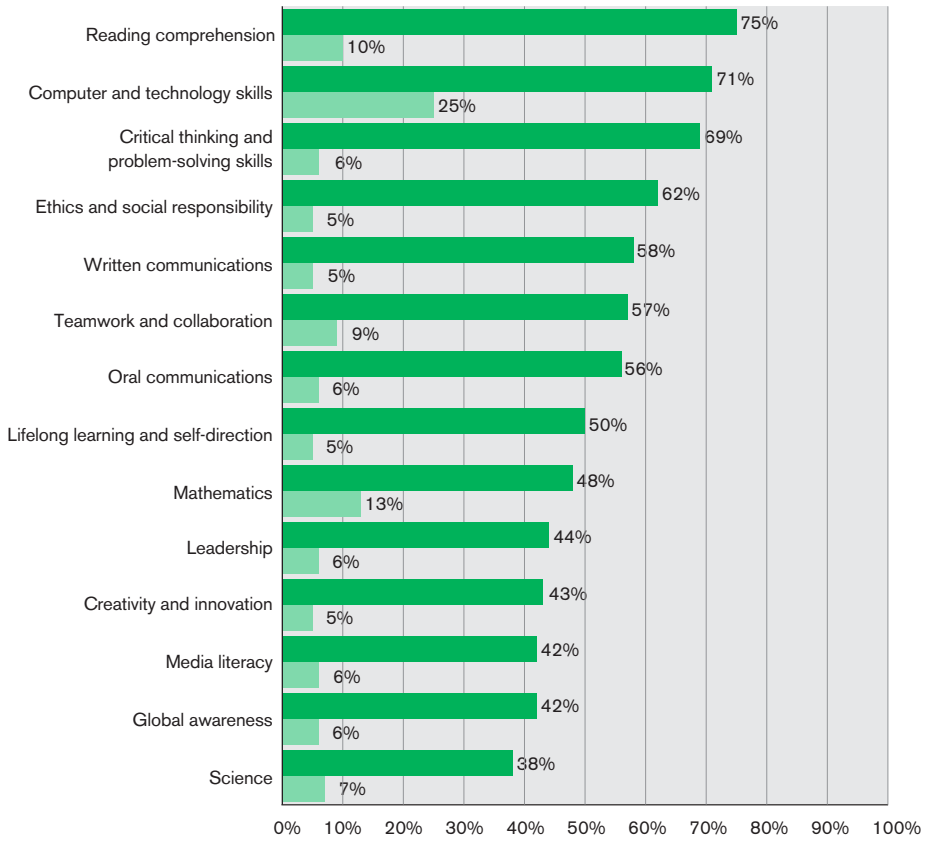
Though there is less available data concerning students' conceptual skills, there is some evidence that the development of these kinds of skills may not be getting the support it needs in the U.S. education system. Many of the skills that Pink defines, for example, are often developed through art and music programs, many of which have been cut in recent years as educators focus on spending resources to meet standardized testing requirements. Educators may increasingly be torn between offering courses that emphasize the more analytical skills needed to compete in a global knowledge economy and those that are required to support a creative economy built on right-brain directed thinking and conceptual skills.

Implications of an unprepared workforce

In a scenario where there are significant gaps between the skills of the available workforce and those needed by employers, employers are likely to react in a number of ways. Many will seek to replace the unskilled workforce through some means—either through the use of technology or by replacing domestic workers with more skilled and often lower-paid workers overseas. In a 2006 SHRM survey of the trends most likely to influence the workplace in the next decade, HR professionals said that the increased use of outsourcing (offshoring) of jobs to other countries was second only to increased health care costs as the most significant trend to make an impact on the workplace and HR profession. A comparative lack of quality graduates in the math, science and engineering fields is viewed as a key driver of offshoring and the evolution from basic business process outsourcing to the development of major offshore research and development operations. According to the National Science Board (NSB), the U.S. high-technology trade balance turned negative in the past several years. Trade data for five high-technology manufacturing industries—aerospace, pharmaceuticals, office and computing equipment, communications equipment, and scientific instruments—show that, beginning in 1998, U.S. high-technology industries' imports exceeded exports. This change is significant because it is seen as an indication of the international competitiveness of the nation's high-technology industries. In its *National Action Plan for Addressing the Critical Needs of the U.S. Science, Technology, Engineering, and Mathematics Education System*, published in 2007, the NSB stresses the difficulty the United States will have in competing if students do not improve their international standing in the sciences, technology, engineering and mathematics (otherwise known as STEM education).

In addition to a greater dependence on offshoring, a shortage of skilled workers is likely to encourage greater reliance on technology to take on jobs previously done by knowledge workers. Developments in artificial intelligence are leading to technologies that can take on tasks of greater complexity. Recent news stories about artificial technology have included offshore oil drilling platforms operated completely without personnel, computers that are capable of generating narrative, including novels, and the growing popularity of podcasts that feature leading professors and other thought leaders and enable them to reach an audience of millions. These kinds of technological developments either amplify the reach of a small group of highly-skilled and knowledgeable experts or eliminate the need for such experts entirely. Though these kinds of technologies are likely to develop regardless, skills shortages could speed the process of technological job takeover in the fields where shortages are most severe.

Figure 3 | Gaps Between Skills Voters Value and How Well Schools Teach These Skills



Source: Partnership for 21st Century Skills. (2007). *Beyond the three Rs: Voter attitudes toward 21st century skills.*

In addition to focusing on immediate skills shortages, HR professionals must also become more involved in the development of the future workforce.

Greater reliance on offshoring and technology may eventually influence the United States' standing as a leader in technological innovation and excellence in higher education. Sixty percent of all bachelor degrees earned in China are in science and engineering, compared with only 31% in the United States. Many of the most gifted foreign students who once headed to the United States for undergraduate and graduate degrees are now looking to emerging economies such as India and China as education hubs. A January 2008 article in leading Indian news daily, the *Hindustani Times*, focused on the growing trend of Indian students "flocking to Chinese universities" as a result of "easy admission systems, affordable fees and high standards of facilities." In addition, many U.S. universities are establishing campuses overseas, and there is a growing tendency to offer education through distance education and online programs. Where they once came to the United States, studied and stayed, many becoming citizens eventually and contributing to the U.S. economy, many of the world's most intelligent, high-potential students may now be "staying home," finding jobs or establishing businesses in their growing economies. As science-based education and research develops in these emerging economies, particularly China, these countries could begin to supplant the United States as education hubs. This may be particularly true if higher-education costs in the United States continue to climb sharply, pulling higher education further out of reach of many gifted students, both international and American.

The way forward

Currently, the United States is considered one of the most competitive nations on the planet. For the past two years, it has been ranked at the top of the list of the World Economic Forum's *Global Competitiveness Report* due to its "winning combination of highly sophisticated and innovative companies operating in very efficient factor markets […] buttressed by an excellent university system and strong collaboration between the educational and business sectors in research and development." This level of success provides a firm foundation for the future competitiveness of the U.S. workforce, but it is no reason for complacency. Rather than focusing solely on the immediate and growing problem of skills shortages by seeking alternatives to U.S. workers through the increased use of offshoring or greater reliance on technology, employers and HR professionals can also get much more involved in developing the skills of the current and future workforce either through investing in training or by more serious efforts to influence local, regional and national education policies.

A growing number of national bodies, including SHRM, are weighing in on how to improve the workforce readiness of the future U.S. labor force. In November 2007, SHRM hosted a symposium titled "Workforce Readiness of the Future U.S. Labor Pool," an executive roundtable discussion of HR leaders and policy and education experts. The discussion of potential ways the HR profession can move the debate forward included the following suggested actions:

- Form a coalition of key business organizations to create a clear direction and principles for workforce readiness.
- Convince leaders to articulate a strong vision and a rallying cry around workforce readiness.
- Define the specific workforce skills and capabilities that employers need.
- Change how reimbursement takes place for company-funded tuition reimbursement programs to encourage voucher-based tuition reimbursements.

Actions that participants felt the government needed to take to address the problem included:

- Learn from successful programs and get evidence on what works so that such programs can be replicated.
- Consider national certification programs that demonstrate readiness for various entry-level jobs.
- Streamline federal programs to work more efficiently and to coordinate better with regional initiatives.
- Develop and implement programs that assist the dislocated, immigrant and older workers.
- Invest in teacher retraining.
- Provide individuals with tools to analyze their own competencies and readiness gaps.

Symposium participants also identified more radical steps they would ideally like to occur:

- Free education: As higher education grows further out of reach for middle- and lower-income students, lowering education costs becomes crucial. Many participants felt that education, at least at the community-college level, should be free.
- Increased teacher salaries and pay for performance.
- A longer school year.
- New models of education.
- Large-scale programs that teach soft skills and better integrate the needs of the business world with the skills being taught.

Given the number of people with a stake in the future skills of U.S. workers, not the least of which is the U.S. workforce itself, there should be a strong national demand to make the changes

necessary to bring skill levels up to meet and exceed those of the global competition. And given the number of education, business and government bodies that look at growing skills shortages with dismay, there should be no lack of ideas for how to move things forward, especially considering how much money is already being invested in education.

What may be needed most is leadership that brings together the best ideas, coordinates strategies and defines the changes that are needed. HR professionals are well positioned to provide some of this kind of leadership within their communities and collectively at the national level. SHRM is investing more in workforce readiness initiatives that combine awareness, action and advocacy and involve not only new entrants to the workforce, but also incumbent members, re-entrants and transitioning, mature members of the workforce. As the business world begins to deal with the growing challenge of building a strong, skilled and capable workforce, HR professionals will be called upon to demonstrate their capacity for leadership not only by dealing with the immediate problem of finding workers with the right skills but also by shaping the solutions that address the wider crisis. WV

Resources

The Conference Board. (2008). *New graduates' workforce readiness: The mid-market perspective.* New York: Author.

Fegley, S. (2006). *SHRM 2006 succession planning survey report.* Alexandria, VA: Society for Human Resource Management.

Fegley, S. (2006). *SHRM 2006 talent management survey report.* Alexandria, VA: Society for Human Resource Management.

Losey, M., Meisinger, S., & Ulrich, D. (2005). *The future of human resource management.* Hoboken, NJ: John Wiley and Sons.

The National Science Board. (2006). *Science and engineering indicators 2006.* Retrieved from www.nsf.gov/statistics/seind06/

The National Science Board. (2007). *A national action plan for addressing the critical needs of the U.S. science, technology, engineering, and mathematics education system.* Retrieved from www.nsf.gov/nsb/stem/index.jsp

Organization for Economic Co-operation and Development. (2003). *Learning for tomorrow's world.* Retrieved from www.oecd.org

Organization for Economic Co-operation and Development. (2006). *Education at a glance.* Retrieved from www.oecd.org

Organization for Economic Co-operation and Development. (2007). *PISA 2006 science competencies for tomorrow's world.* Retrieved from www.oecd.org

Partnership for 21st Century Skills. (2007). *Beyond the three Rs: Voter attitudes toward 21st century skills.* Retrieved from www.21stcenturyskills.org/documents/P21_pollreport_singlepg.pdf

Pink, D. (2005). *A whole new mind: Moving from the Information Age to the Conceptual Age.* New York: Riverhead Books.

Porter, M., Salai-i-Martin, X., & Schwab, K. (2007). *The global competitiveness report 2007-2008.* World Economic Forum. Geneva, Switzerland: Palgrave MacMillan.

Schramm, J. (2006). *SHRM workplace forecast.* Alexandria, VA: Society for Human Resource Management.

Society for Human Resource Management. (2008). *The SHRM Symposium on the Workforce Readiness of the Future U.S. Labor Pool: Executive Summary.* Retrieved from www.shrm.org/trends

Society for Human Resource Management, the Conference Board, Partnership for 21st Century Skills, Corporate Voices for Working Families. (2006). *Are they really ready to work?* United States: Authors.

Softscape. (2008, January 30). *State of the global talent nation.* Retrieved from www.softscape.com/whitepapers/SGTN.htm

Swamy, N. (2008, January 26). Indian students flock to China. *Hindustani Times.* Retrieved from www.hindustantimes.com

Tulip, P., & Wurzburg, G. (2007, December 6). *Primary and secondary education in the United States.* [Economics department working paper No. 585.] Organization for Economic Co-operation and Development. Retrieved from www.olis.oecd.org/olis/2007doc.nsf/linkto/eco-wkp(2007)45

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