

Science, Technology, Engineering, and Math Skills The Foundation for a Highly Skilled Workforce

Our Economy – Our Future

In recent years, economists and public policy experts have focused a great deal of attention on a growing need to increase the quality of science, technology, engineering, and mathematics (STEM) skills of its current and future workforce. Their message has been that our country's future in a global economy is dependent on its ability to be innovative. Innovation in this context is defined as the ability to rapidly translate knowledge and insights into new high value products and services.¹ Innovation requires knowledge acquired through education or, more specifically, STEM skills.

Occupational Outlook

Employment projections demonstrate that the jobs of tomorrow will require higher STEM skill levels supported with lifelong learning. As reflected in Figure 1, the nation's STEM workforce is expected to increase 7% between 2008 and 2013, slightly more than the metro Chicago region's² and Illinois's projected increase of 6%. In 2008, the region's STEM workforce represents 64.5% of the State's total STEM workforce.

486,235 by 2013 and represent 8.6% of the region's labor force (5,647,351).

In addition to 29,045 new jobs, over the next five years 60,775 skilled replacement workers will be needed for STEM jobs that are vacated by workers retiring or otherwise leaving STEM jobs. This number is reflective of the large number of Baby Boomers expected to retire in the coming years. It is particularly significant in terms of STEM occupations because as skilled Baby Boomers retire, an increasing proportion of the entering workforce will be from segments of the population that historically have lower levels of postsecondary education and are, therefore, less likely to acquire the skills needed to perform STEM occupations.³

In looking at regional STEM occupations that will have the highest demand for new and replacement workers through 2013, the top high demand job classification is accountants and auditors (13,341) followed by postsecondary teachers (10,044), computer software engineers, applications (6,812), automotive service technicians and mechanics (6,398), and computer software engineers, systems software (5,363).⁴ In looking at the regional demand for all STEM occupations by major job category, the majority (35.9%) of the region's new and replacement STEM occupations are in the Computer and Mathematical Science Occupations, followed by the Business and Financial Operations Occupations (15.9%) and Education, Training and Library Occupations (10.3%).

As a group, STEM workers earned about 70% more than the national average in 2005, according to the Bureau of Labor Statistics.⁵ The median hourly earning in the region for all STEM occupations is \$24.89 as compared to \$25.00 for the State and \$24.79 for the nation.

Projected Job Growth/STEM Occupations				
Figure 1				
	2008 STEM Jobs	2013 STEM Jobs	Change	% Change
Regional Total	457,189	486,235	29,045	6%
Illinois Total	709,310	753,067	43,757	6%
National Total	17,804,355	19,099,968	1,295,612	7%

Source: Economic Modeling Systems, Inc.

In 2008, the region's 457,189 STEM occupations represent 8.4% of the region's total labor force (5,430,866). That number is expected to increase to

¹ Council on Competitiveness, <http://www.compete.org/explore/drive-innovation-entrepreneurship>

² The metropolitan Chicago region includes the City of Chicago and the following counties: Cook, DuPage, DeKalb, Grundy, Kane, Kankakee, Kendall, Lake, Livingston, McHenry, and Will.

³ *Keeping Illinois Competitive*, Northern Illinois University, June 2006, page 2.

⁴ For the purpose of occupational data presented in this report, STEM occupations are those identified on the online O*NET system (<http://onlineoncenter.org/>). Data source is Economic Modeling Systems, Inc.

⁵ *Occupational Outlook Quarterly*, STEM Occupations, U.S. Bureau of Labor Statistics, Spring 2007, page 27.

Investment in the Future

The America Creating Opportunities To Meaningfully Promote Excellence in Technology, Education and Science Act (American COMPETES Act), signed into law by President Bush on August 9, 2007, is the most recent federal legislation to address the nation's need to remain a leader in innovation and strengthen the STEM skills of its citizens. The America COMPETES Act provides a total of \$33.6 billion in newly authorized spending levels for research and education programs.⁶

The Act focuses on three primary areas: 1) increasing research investment, 2) strengthening educational opportunities in science, technology, engineering, and mathematics from elementary through graduate school, and 3) developing an innovation infrastructure.⁷

The educational system is responsible for developing a pool of technically adept and numerically literate individuals and a continual supply of highly trained mathematicians, scientists, and engineers.

Meeting the Challenge of a Changing World, Strengthening Education for the 21st Century, U.S. Department of Education, 2006.

Summary

This year, \$33.6 billion in public funds will be available in public funds to address the nation's need for individuals with strong STEM skills. Is it enough?

In reviewing the STEM literature in the context of workforce development, there are three reoccurring themes:

The need to improve teacher abilities to equip our youth with the mathematic and science skills needed for postsecondary education in preparation for STEM careers.

The need to increase awareness of and interest in STEM career opportunities.

The need to maximize the benefit of publicly funded programs and initiatives through increased collaboration and coordination between programs.

In an effort to address two of these points, The Workforce Boards of Metropolitan Chicago are currently compiling an inventory of STEM initiatives underway in the metro Chicago area and other STEM resources. More information regarding the inventory will be posted on the Workforce Board's regional website (www.workforceboardsmetrochicago.com). Additionally, the Workforce Boards are seeking federal funds to address the need for improved career information on high demand STEM occupations.

In conclusion, the metropolitan Chicago region's future economy is highly dependent on its ability to develop a STEM workforce that meets the needs of its employers. This will include jobs that can be foreseen – as well as those that will emerge as a result of future innovation. The choice is simple, either the region's citizens acquire the skills needed for these jobs or employers will find skilled workers elsewhere.

Thanks to globalization, driven by modern communications and other advances, workers in virtually every sector must now face competitors who live just a mouse-click away in Ireland, Finland, China, India, or dozens of other nations whose economies are growing.

Rising Above the Gathering Storm, Energizing and Employing America for a Brighter Economic Future, Executive Summary, National Academy of Sciences, 2007.

The Grundy Livingston Kankakee Workforce Board is a member of The Workforce Boards of Metropolitan Chicago. For more information on topics introduced in this article, please visit www.workforceboardsmetrochicago.com to view the full report.

⁶ White House Press Release, President Bush Signs America COMPETES Act, August 2007, <http://www.whitehouse.gov/news/releases/2007/08/20070809-3.html>

⁷EdNews, Summary of the America COMPETES Act, <http://www.ednews.org/articles/10558/1/SUMMARY-OF-THE-AMERICA-COMPETES-ACT/Page1.html>