

Wisconsin Project Lead The Way News Alert

What the Wisconsin Technology Council is saying about STEM

In a report distributed in April 2009, the Wisconsin Technology Council (WTC) said Wisconsin needs a more tech-savvy workforce to be competitive in the knowledge-based, global economy. This paper summarizes the council's 16-page report and highlights the inadequacies that relate to science, technology, engineering and mathematics (STEM) in the education of today's youth, which are being addressed by programs like Project Lead The Way.

An independent, non-profit and non-partisan organization, the Wisconsin Technology Council is the science and technology advisor to the Governor and State Legislature. Formally organized in 2001, the Tech Council is composed of members from technology companies, private equity firms, public and private education, research institutions, government and law.



Educating a Tech-Savvy Workforce for Wisconsin

April 2009 | Wisconsin Technology Council

TABLE OF CONTENTS

- Introduction
- Executive Summary
- Background
 - Global competitiveness in the global market place: Can America maintain its historic dominance?
 - Global competitiveness and national security - Safety in numbers and innovation
 - Changes in 21st century jobs and skills
- STEM in Wisconsin
 - WI Economic Health
 - STEM education attainment in Wisconsin: A comparative look
- Modes for Change and Successful Models
 - Leading states and their policies
 - Leading K-12 STEM programs
- Recommendations
- Conclusion
- References
- Appendix

Global Climate

To fully understand what Wisconsin needs to do to improve its workforce, one must consider the global climate. While the United States remains the strongest and most innovative economy in the world, changes in the global marketplace are causing it to lose its edge.

- Although the U.S. anticipates increased federal investments in research and development in coming years, such investments were relatively stagnant from 2000 through 2007. Meanwhile, research and development expenditures outside the U.S. more than doubled from 1990 to 2003, from \$225 billion to \$500 billion.
- At precisely the time we need more knowledge-based workers, the U.S. has experienced a slow but serious decline in the number of STEM graduates. While the United States was third per capita in engineering graduates in 1975, it ranks 17th in the world today.
- While postsecondary enrollment has increased in the U.S. in the past decade, the proportion of students obtaining STEM degrees has declined. The proliferation of these issues sets the stage for an inadequate workforce for 21st century global competition.
- The Wisconsin Department of Workforce Development's projections for the state parallel that of the nation's growth in STEM occupations. The DWD estimates that one in 10 Wisconsin jobs is a STEM job. STEM jobs are also the fastest growing occupations in the state. Between 2006 and 2016, STEM jobs will account for one out of five new jobs in the state. That's more than 5,250 jobs each year.

STEM Improvements Needed in Wisconsin

Focusing on the STEM curriculum at the middle and high school levels is imperative in cultivating interest in STEM careers. However, STEM curriculums don't always adequately raise awareness for the opportunities that exist in technical industries, nor do they provide students with the preparation they need to easily transition into post-secondary courses. These are the concerns that came out of "Educating a Tech-Savvy Workforce", a program held by WTC and Wisconsin Security Research Consortium in the first quarter of 2009.

The program drew more than 575 business owners, community leaders, educators, legislators and others to town hall meetings throughout the state to discuss how STEM education is essential to U.S. and Wisconsin competitiveness. Here's what attendees said:

- College-level educators are concerned with the quantity of remediation teaching needed for new college students. A surprising amount of remediation teaching goes to students who scored well in high school math and science.
- Businesses professionals in technical disciplines are frustrated with the need to retrain workers in basic math. They feel as though this ability should be developed before graduation.
- Business leaders and educators alike believe the current student assessment system, with overlapping state and federal requirements, produces a culture of "teaching to the test." They believe that hampers classroom innovation and cuts into the time needed to work together on producing better graduates.

Between 2006 and 2016, STEM jobs will account for one out of five new jobs in the state.

Continued on back

Continued from page 1

While the nation ranks poorly from a global perspective, Wisconsin middle and high school students rank well in math and science achievement from a national perspective. In addition, the percentage of Wisconsin students in 4th and 8th grade who are at least proficient in math and science is above the national average and second to Minnesota in a comparison of neighboring states, according to 2007 figures from the U.S. Department of Education.

However, there is fundamental dissatisfaction among educators who believe the assessment system is a flawed indicator and among employers who say too many students are ill-prepared. In addition, segments of Wisconsin's K-12 population are failing to gain the STEM skills they need to become competitive workers. Many students, particularly young women, lose interest in science and math by the time they've completed middle school. Too many students are not exposed to careers that may not require a four-year college degree – but which require a strong working knowledge of science and math.

According to a report by the Education Trust, Wisconsin also continues to lag behind in closing the education achievement of all racial and ethnic groups. Additionally, while Wisconsin records math and science scores above the national average, the rate at which Wisconsin students improve their scores year to year is below average, especially among low-income students.

Recommendations to Improve STEM in Wisconsin

At the closing of its report, the Wisconsin Technology Council makes the following recommendations:

- Use student assessments effectively – All students should be motivated by relevant, engaging assessments that are dynamic in analysis and are linked to 21st century skills, including high school assessments that support college or vocational readiness.
- Provide teachers with the training they need – Wisconsin teacher licensing requirements should include latitude for teachers whose backgrounds are in professions outside of education. Wisconsin should revive summer training academies with a financially sustainable model involving both public and private support.
- Engage businesses in meaningful ways – Develop a statewide initiative modeled after Minnesota's "getSTEM" initiative to help businesses and education connect in tangible ways. One Minnesota technique involves online matching of business resources with school needs.
- Make STEM education a statewide public policy priority – The Governor and Legislature should establish a statewide task force that tracks best practices at home and in other states, engages businesses in STEM education on a continuing basis, encourages a prekindergarten-16 collaborative approach to STEM education and develops recommendations for long-term funding of effective STEM education.

For More Information...

To view the Wisconsin Technology Council's "Educating a Tech-Savvy Workforce for Wisconsin" report in its entirety, download the PDF at http://www.wisconsintechcouncil.com/uploads/Tech-Savvy_WhitePaper_FINAL.pdf or call 888-443-5285 to request a hard copy. WTC is located at 455 Science Drive #240, Madison, WI 53711. Visit the organization online at www.wisconsintechcouncil.com.

"Building a knowledge-rich, high-technology sector in our economy will require that Wisconsin have a clear plan for the systematic production of new knowledge-based products and services. New scientific discoveries and technologies developed in Wisconsin can provide the competitive advantage for Wisconsin businesses, if and only if such knowledge can be identified and rapidly deployed. That demands a more tech-savvy workforce – one that is up to the challenge of transferring knowledge and innovation to the marketplace."

*"Educating a Tech-Savvy Workforce for Wisconsin"
April 2009, Wisconsin Technology Council*

About Project Lead The Way

Project Lead The Way is an innovative curriculum for middle and high school students that addresses the nation's need for a more tech-savvy workforce—and students that are better prepared to study science and math in college. PLTW forms partnerships with schools, higher education institutions and the private sector to increase the quantity and quality of engineers and technical professionals graduating from our educational system. The PLTW curriculum was first introduced to 12 New York State high schools in 1997. A year later, PLTW field-tested a four-unit Middle School Program in three middle schools. Today, the programs are offered in some 3,000 schools in 50 states and the District of Columbia. More than 200 schools in Wisconsin currently feature PLTW coursework.



To learn how Project Lead The Way can help improve the STEM curriculum in your school, visit www.pltw-wi.org or contact PLTW Wisconsin Affiliate Director Steve Salter at salters@msoe.edu or 414-277-7255. His address is 1025 North Broadway, Milwaukee, WI 53202.