Learning science and technology must improve for U.S. to compete globally

By WILELLA BURGESS
For the Journal & Courier

The number of American-born engineers graduating from U.S. institutions has tumbled 20 percent in recent years to less than 60,000 a year. Estimates also indicate this nation will need 10,000 more engineers than it is likely to produce during the next decade.

By comparison, the number of engineers graduating annually in China has risen by 161 percent to more than 200,000. Japan and India each are graduating more than 100,000 engineers a year.

More than any time in this nation's history, leaders at universities, high schools and elementary schools must unite in a 21st century mission to better prepare our students and teachers in the areas of science, technology, engineering and mathematics.

Purdue's Discovery Park has invited John Marburger III, director of the White House Office of Science and Technology Policy, to address all Hoosiers on Friday about the federal government's plans to respond to this complex challenge.

His message should resonate with educators, business leaders, policymakers and others. The stakes couldn't be greater for our ability to compete in a global marketplace and generate a stronger work force.

The National Science Foundation predicts that more than 90 percent of the world's scientists and engineers will live in Asia by 2010 unless the United States places a greater emphasis on these disciplines.

Of equal concern, a separate report by the National Assessment Governing Board indicated that more than 50 percent of U.S. students do not take any science classes in the 12th grade. Those who do rank below the average of their international counterparts, according to the Third International Math and Science Study.

Closer to home, a 1999 study indicates that Indiana institutions produced 20 percent more baccalaureate graduates than the national average. At the same time, however, Indiana's retention of graduates is 30 percent below the national average — 40 percent among engineering and technology majors.

The time to act is now.

We must pursue research that explores novel technologies designed to enhance learning at all levels and address issues spelled out in the oft-cited 2005 report by the National Academies of Science titled "Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future."

We must provide research-driven internship programs so students in science, technology, engineering and mathematics can be paired with K-12 teachers. We then can develop more innovative tools so teachers can improve learning among our youngest students and excite them about what is known as STEM education.

The bridge between academia and industry must be extended and widened, introducing graduate students in the science and engineering fields to K-12 teachers. That way, both groups can share their knowledge and keep abreast of changes in these fast-changing disciplines.

Importantly, we must make advances in encouraging more minority students to pursue advanced degrees in these disciplines. The Louis Stokes Alliance for Minority Participation, for example, is working with U.S. universities to double the number of minority graduates in those fields.

The Midwest Crossroads Alliance for Graduate Education and the Professoriate collaborates with Purdue University's Discovery Learning Center in Discovery Park as well as Northwestern University and Indiana University to grow the number of minority students pursuing doctoral degrees in those areas.

The future of the youngest students in classrooms today will depend on our ability to respond to the mandate spelled out clearly in the National Academies' "Gathering Storm" report.

"Although many people assume that the United States will always be a world leader in science and technology, this may not continue to be the case inasmuch as great minds and ideas exist throughout the world. We fear the abruptness with which a lead in science and technology can be lost — and the difficulty of recovering a lead once lost, if indeed it can be regained at all."

Burgess is the managing director of the Discovery Learning Center in Purdue's Discovery Park.