



Business-Higher
Education Forum

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FORUM FOCUS

Spring 2006

Can America Globalize Itself?

New Initiatives Propose Solutions,
But Will They Reverse Trends?



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Can America Globalize Itself?

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About BHEF

The Business-Higher Education Forum is an independent, non-profit membership organization of leaders from American businesses, colleges and universities, and foundations. The Forum's mission is to engage and inform members, policy makers, and the public regarding strategic national challenges of high priority to both business and higher education, and to help shape sound policy to address these challenges. The Forum achieves its mission through collaboration of corporate and academic leaders, high-quality policy research, effective communication, and advocacy with federal, state, institutional, and corporate policy makers.

Founded in 1978, the Forum was hosted by the American Council on Education until it became an independent organization in September 2004.



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Chairman's Letter

This fall, the Business-Higher Education Forum will celebrate its second year as an independent organization. During these first two years, the Forum successfully established its national presence as a strong advocate for a policy agenda that will help America maintain its leadership position in the world economy. This new issue of *Forum Focus* reflects such a policy agenda.

"Can America Globalize Itself?" is a question American leaders need to confront to show that the country is prepared for Tom Friedman's flat world. With the future of American innovation and competitiveness in jeopardy, the United States must make significant commitments to maintain its leadership in science and technology.

The Forum's university and business leaders have responded by joining forces with other national organizations and by launching a multi-year initiative addressing, among other issues, low student participa-

tion and achievement in mathematics and science, specifically among women and minorities; the challenge of changing demographics; and the shortage of highly qualified teachers. These were some of the themes the Forum and its collaborators discussed at the Winter 2006 meeting and that are featured in this issue.

As we look forward to our summer meeting in June, we will be advancing our agenda to improve science, technology, engineering, and mathematics (STEM) education with such prominent speakers in Washington as U.S. Secretary of Education Margaret Spellings and White House Office of Science and Technology Director John Marburger, who will speak about President Bush's American Competitiveness Initiative (ACI). Discussions between the speakers and Forum members will follow both presentations and we hope to benefit from a productive dialogue on this important federal initiative.

The upcoming June meeting will also mark the completion of my two-year term as Chairman of the Forum. These two years have been most gratifying for me and I would like to thank the membership and staff for their continued support and hard work. At the meeting, I will pass the gavel on to my successor and colleague, Herbert M. Allison, Jr., Chairman, President, and CEO of TIAA-CREF. Herb has been an outstanding Vice Chairman and I look forward to continuing to work with him during his leadership.

Sincerely,

Mark S. Wrighton
Chancellor,
Washington University in St. Louis
2004-2006 Forum Chairman



Vice Chairman's Message

Since becoming independent in September 2004, the Business-Higher Education Forum has focused its agenda on influencing selected areas of policy-making where we can have the most impact. A key initiative is strengthening science, technology, engineering, and mathematics (STEM) education in America—an objective that has attracted much attention in the past months.

Members of Congress on both sides of the aisle as well as the Bush Administration appear willing to dedicate resources to better understanding the STEM challenge and how it can be addressed. Earlier this year, prompted by Senators Lamar Alexander (R-TN), Jeff Bingaman (D-NM), and Representatives Sherwood Boehlert (R-NY) and Bart Gordon (D-TN), the National Academies recommended actions that federal policy makers could take to preserve America's world leadership in science and technology in its report, *Rising Above the Gathering Storm: Energizing and Employing America for a*

Brighter Economic Future. President Bush then announced in his State of the Union address the "American Competitiveness Initiative" (ACI), which proposes increasing investments in research and development, strengthening education, and encouraging entrepreneurship and innovation.

Now viewed as a leading voice in STEM, the Forum is well positioned to advocate, along with its members, for effective policy at the local, state, and federal levels. Through our newly launched "Securing America's Leadership in STEM" initiative, we will bring together academic and business leaders to recommend policies and implement programs that will help the United States produce a world-class workforce and strengthen the nation's research and development infrastructure.

Our Winter 2006 meeting focused on the STEM initiative, with discussion on the impact of college enrollment on economic

growth; the importance of increasing women and minority participation in the STEM disciplines; the teacher shortage crisis; the outcomes of a liberal education in the 21st century; and how to enhance business-university research collaborations that lead to advances in innovation.

During our summer 2006 meeting, there will be ample opportunity for discussion and planning of our next steps in advancing this critical initiative. I look forward to a successful meeting.

Sincerely,

Herbert M. Allison, Jr.
Chairman, President, & CEO, TIAA-CREF
2004-2006 Forum Vice Chairman

Can America Globalize Itself?

New Initiatives Propose Solutions,
But Will They Reverse Trends?

“The ultimate challenge for America—and for Americans—is whether we are prepared for this flat world... Are we conducting ourselves in a way that will succeed in this new atmosphere? Or will it turn out that, having globalized the world, the United States had forgotten to globalize itself?”

—Fareed Zakaria,
editor of *Newsweek International*

Rapid global economic integration over the past decade, coupled with troubling signs that indicate America may be losing its competitive edge, has led to increasingly urgent calls for greater investments in science and technology. But until recently, these calls have been dismissed as nothing more than doomsayers’ predictions of America’s decline.

A recent Business Roundtable survey indicates that a majority of American opinion leaders and voters view the United States as the leading economic power today, but see China emerging in two or three decades as the world’s leader in the new “flattened” world, with the United States slipping to a weakened second place, and India following not far behind.

In light of these predictions, one must ask: “Does the United States have the will to globalize itself by reversing trends that threaten U.S. innovation and competitiveness?”

Fortunately, America’s leaders are responding to this challenge. An emerging consortium of leaders from the private and public sectors, including President George

W. Bush, have recently joined forces to introduce a number of bold and expansive federal initiatives that encompass education, research and development (R&D), and tax policy.

In his 2006 State of the Union address, the President announced an “American Competitiveness Initiative” (ACI), committing \$5.9 billion in fiscal year 2007, and more than \$136 billion over the next 10 years, to increase investments in R&D, strengthen education, and encourage entrepreneurship and innovation. (See related sidebar, p. 6.) And Congress has introduced a number of high profile bills, including the PACE Act (Protecting America’s Competitive Edge), that propose new initiatives to promote math and science education and stimulate



The President's American Competitiveness Initiative (ACI)

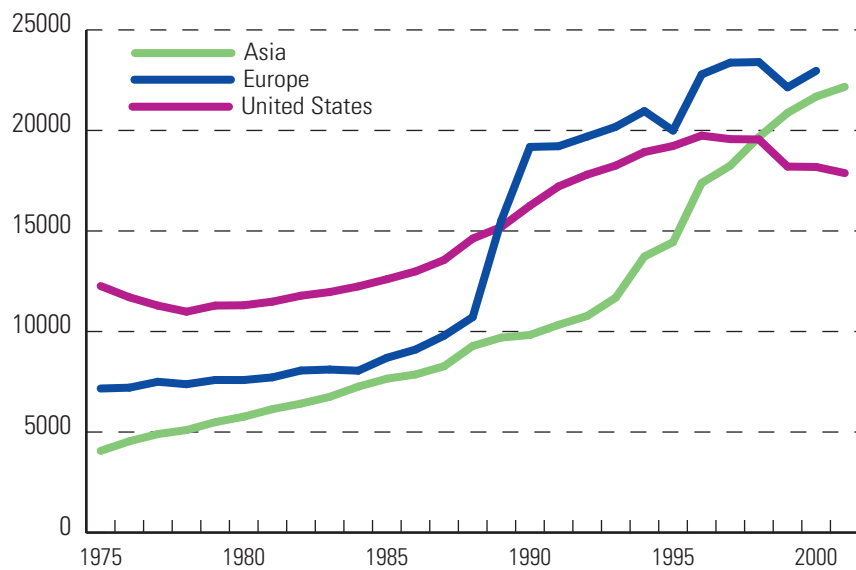
President Bush's new education proposals are part of a larger plan to spur technology innovation. A large portion of the funding in the President's ACI is expected to promote federal research through organizations such as the National Science Foundation (NSF), the Department of Energy's Office of Science, and the Department of Commerce's National Institute of Standards and Technology. The hope is that the investment will lead to the development of a wide range of new and emerging technologies—including nanotechnology, supercomputing, and alternative sources of energy—with implications for schools.

Another way ACI seeks to promote economic competitiveness is through some \$4.6 billion in tax credits to U.S.-based companies to encourage the continued development of new technologies.

The ACI has also gained the support of leaders in key education groups: "Science and math education—in addition to basic research and policies that encourage innovation at our nation's labs and universities—are critical to our nation's future competitiveness," said Gerald Wheeler, Executive Director of the National Science Teachers Association. "Our nation's science teachers are educating the next generation of scientists, engineers, and workers who will find new ways to defend our country, create new technologies, and cure diseases. We commend the president for highlighting the importance of science and math before a national audience." ■

U.S. Lags Europe and Asia in Producing Advanced Degrees

Natural Science and Engineering Doctoral Degrees in United States, Europe, and Asia: 1975-2001



Source: Science and Engineering Indicators, National Science Board, Figures 2-38 (2004)

increased investment in federal R&D (see related sidebar). But given the tight budgetary climate in Washington, DC, it remains to be seen which, if any, of these initiatives will secure the necessary resources.

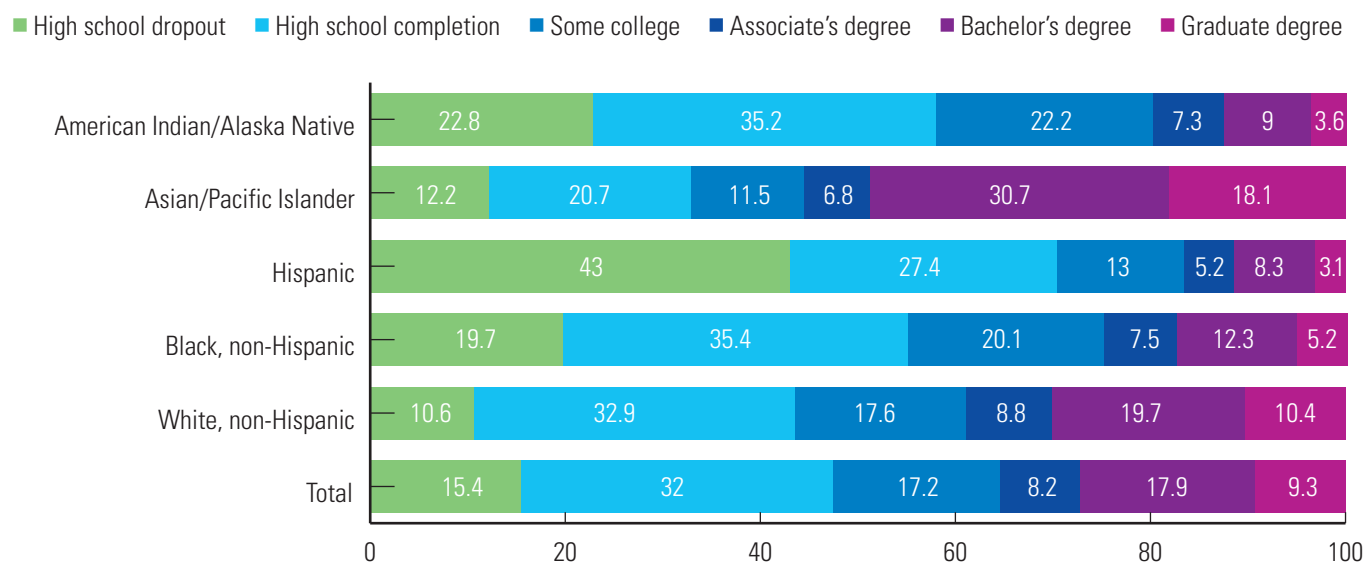
Even if they do gain the necessary funding, these federal initiatives face daunting challenges in reversing the prevailing troubling trends. Ensuring future U.S. innovation and competitiveness will require a concerted national effort from all stakeholders, including state and federal government, business, education, and the general public. The Business-Higher Education Forum (BHEF) has been a leading voice in bringing these groups together. In January 2005, BHEF released its widely cited report, *A Commitment to America's Future: Responding to the Crisis in Mathematics and Science Education*, which addressed the need for multiple stakeholders to work together to improve K-12 mathematics and science education. The Forum then launched a major new initiative, "Securing America's Leadership in Science, Technology, Engineering, and Mathematics," that outlines a comprehensive nationwide strategy to double the number of science, technology, engineering, and mathematics (STEM) graduates. The initiative addresses a number of critical challenges America needs to overcome if the nation is to successfully globalize itself, challenges such as low student interest and achievement in mathematics and science, shifting demographics, and the shortage of highly qualified teachers.

Troubling Trends

Once the unquestioned world leader in education, the United States finds itself surpassed by or losing ground to other countries on many key educational indicators that serve as harbingers of future economic growth—such as college-degree attainment and student achievement in mathematics and science.

Minorities' College Completion Rates Lag Other Groups

Percentage of Adults Aged 25 and Over, by Highest Level of Education and Race/Ethnicity: 2003



SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), March 2003.

Even though the United States still leads the world in many indicators, the country is clearly falling behind two main competitors—Europe and Asia—in terms of advanced degrees awarded in natural science and engineering, two of the key disciplines needed to remain competitive.

Only 17 percent of bachelor's degrees awarded in the United States in 2000 were in science and engineering fields, compared to an average of 27 percent for other Organisation for Economic Co-operation and Development (OECD) countries and a staggering 52 percent for China.

Given the poor achievement of American students in math and science, many question whether the United States will have the necessary workforce skills to compete in the highly complex fields that drive innovation and fuel economic growth. In fact, a recent assessment by OECD found that American high school students ranked at or near the bottom of 29 countries in students' ability to use mathematics and science knowledge.

The ACT—a not-for-profit organization that provides assessment, research, information,

and program management services in education and workforce development—found similar evidence that high school graduates are not ready for college or work. Their college readiness benchmarks indicate that few high school graduates are prepared to succeed in college-level introductory courses, with just 41 percent of graduates having a high probability of succeeding in college algebra, and only 26 percent likely to succeed in college biology.

ACT found that a major source of this problem is that students are not taking the right courses, and even when they do, the content of the courses may not be sufficient to prepare them for the level of academic rigor they will encounter when they get to college.

While the U.S. economy and its workforce are still considered the world's most powerful and productive, America faces two tough hurdles in the race to stay on top in the flat world: major shifts in demographics and the retirement of the best educated segment of the U.S. population—the baby boomers.

Major demographic shifts are bringing unprecedented numbers of new students to

classrooms. However, they are students who have not typically pursued higher education in large numbers. Hispanics, who have the lowest college-going rate of any group, are expected to account for 80 percent of all new growth in the population of college-aged adults between 2000 and 2020.

Unless college enrollment and completion rates among Hispanics and other minorities improve significantly, the percentage of Americans earning a bachelor's or advanced degree will drop for the first time ever, according to a recent study by the National Center for Higher Education Management Systems (NCHEMS). Assuming current college-going rates, the percentage of American adults who possess a college degree will actually drop by four percent by 2020, while the percentage of those with less than a high school education will rise by 15 percent.

This trend could have dramatic consequences for the labor workforce and for society, as it will be increasingly difficult for employers to hire the highly skilled workers demanded to compete in the global economy.

Raising Awareness to the 'Gathering Storm'

Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future, a report issued by the National Academies (composed of the National Academy of Sciences, the National Academy of Engineering, the Institute of Medicine, and the National Research Council), has been instrumental in getting the education crisis the national attention it deserves.

The report recommended boosting scientific and technological innovation and called for the U.S. government to increase research funding by 10 percent annually over the next several years, with primary attention devoted to the physical sciences, engineering, mathematics, and information sciences.

Combined with earlier reports by the BHEF, the Council on Competitiveness, and the "Tapping America's Potential: The Education for Innovation Initiative" consortium, the Gathering Storm report has drawn attention to the future of America's science and technology infrastructure and has spurred Congress to introduce a series of related bills. Known collectively as the PACE Act (Protecting America's Competitive Edge), these bills would implement the recommendations in *The Gathering Storm* (see article, p. 15, *Expanding America's Talent Pool in the STEM Disciplines*.) ■

What Does This Mean for Business?

U.S. corporate leaders worry that, as competition from other countries is becoming fierce, America is not producing an adequate number of highly trained engineers and scientists. William H. Swanson, Chairman and CEO of Raytheon Company—a leading aerospace and defense systems supplier—and a BHEF member notes that, "the United States will need an adequate supply of engineers and scientists to prosper in this intensely competitive world that is just a 'mouse-click' away.... Much is riding on how well we meet this challenge."

In fact, National Academy of Sciences (NAS) statistics show that, in 2004, the United States graduated only 70,000 engineers, compared to 200,000 in India and 500,000 in China. Recent estimates by the Department of Labor (DOL) also reveal that, by 2010, a staggering 90 percent of the world's science and engineering degrees will be held in Asia.

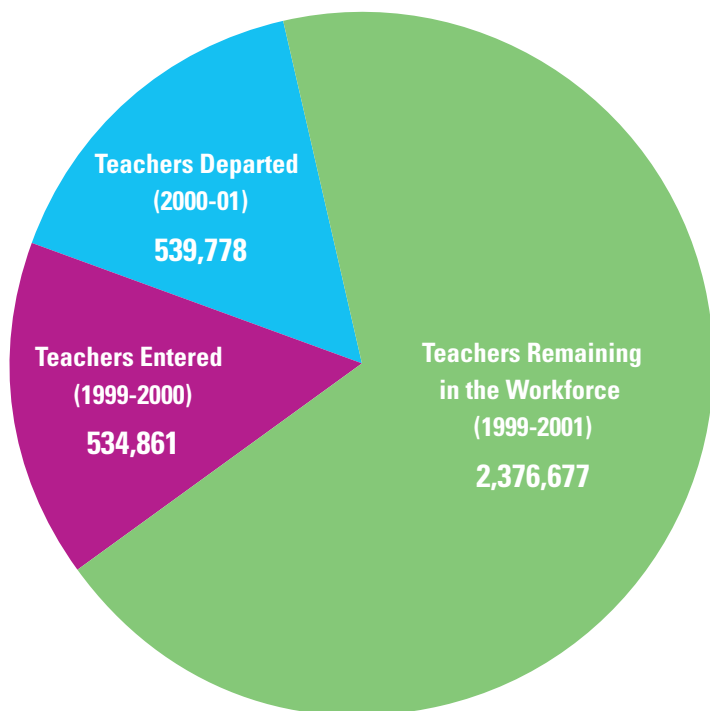
In addition, the DOL projects that the number of jobs requiring science, engineering, and technical training in the United States will have increased 51 percent between 1998 and 2008.

To the dismay of many business leaders, American school children do not show much motivation or interest in the critical STEM fields. According to a study conducted for Raytheon with students in grades 6-8, 84 percent said they would rather engage in activities such as cleaning their rooms, taking out the garbage, eating their vegetables, or even going to the dentist rather than doing their math homework. In the same survey, 43 percent of the students said they found high school math difficult to understand, and 34 percent thought it was just boring.

Realizing that it is imperative for business to be involved in addressing the STEM crisis, companies are already investing in the

Teacher Workforce Faces Significant Turnover

Of a total U.S. teaching workforce of over 3.4 million, more than one million teachers are either entering or leaving the workforce within a one-year period



SOURCE: *No Dream Denied: A Pledge to America's Children*, National Commission on Teaching and America's Future. (2003)

cause. For instance, Raytheon recently launched MathMovesU, a campaign designed to generate new interest in and excitement about math among middle school students (see related sidebar). Ohio-based Battelle—a global science and technology enterprise that develops and commercializes technology and manages laboratories for customers—is partnering with Ohio State University and the local K-12 system to launch Metro High School in Columbus, a new charter school that will emphasize math, science, and technology.

The Teacher Factor

Many experts point to low student interest and performance in mathematics and science as evidence of the daunting challenges that face the U.S. teaching workforce.

Many teachers, particularly in the math and science disciplines, lack adequate preparation needed to effectively teach students complex concepts. That is, they lack either a major or a minor in their assigned teaching field. This trend is most acute in the physical sciences—82 percent of middle school and 51 percent of high school physical science teachers lack a major or minor—and high-poverty schools are the most affected. In addition, many teachers do not have access to professional development that could help them be more effective in the classroom. In a 2003 survey, less than half of teachers said their professional development activities were focused on content and sustained over time, two key characteristics of effective training.

Teacher turnover is another challenge that creates big problems in the classroom. Of a total U.S. teaching workforce of more than 3.4 million, more than one million teachers are either entering or leaving the workforce within a one-year period. And a study by the National Center for Education Informa-

tion estimates that 40 percent of public school teachers will leave the profession within five years.

Teacher turnover also disproportionately affects (1) those children who often have the greatest challenges to overcome—those in high-poverty schools—and (2) the hard-to-staff disciplines of math and science. Using projections from the National Center for Education Statistics, it is estimated that at least 280,000 new mathematics and science teachers will be needed in grades 7-12 by 2014-2015.

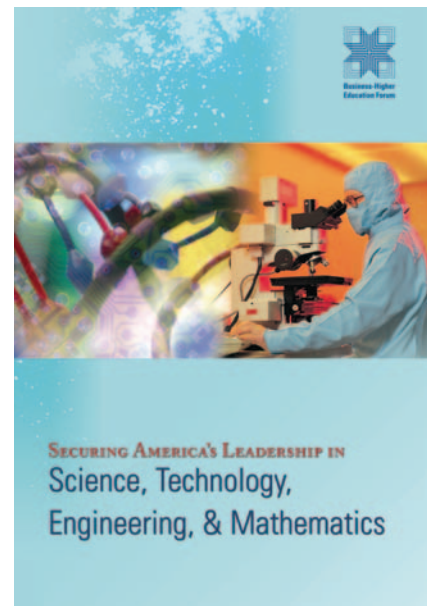
“We have to find teachers who can excite and motivate students in the classroom, who understand the material that they are teaching,” says BHEF member, Warren J. Baker, President of the California Polytechnic State University in San Luis Obispo. He adds, we need to “...engage more effectively with the business community...[to] provide opportunities for students who are thinking about going into teaching, so that science and math students will have opportunities to continue their professional development with the assistance of programs with the national labs and [other corporate] programs.”

Securing America's Leadership

While strides are being made at the federal level with proposals such as President Bush's announcement of the ACI and other initiatives, much more remains to be done.

As mentioned earlier, the BHEF helped to bring this issue to the nation's attention with the release of its January 2005 report, *A Commitment to America's Future: Responding to the Crisis in Mathematics and Science Education*. Then, in July 2005, together with 14 other leading business organizations led by the Business Roundtable, the Forum joined in launching

“Tapping America's Potential: The Education for Innovation Initiative,” a multi-year, multi-pronged effort aimed at doubling the number of STEM majors produced by 2015, thereby ensuring the United States' place as the global leader and improving the quality of the nation's future workforce and its R&D infrastructure.



With its unique membership that includes leaders from American businesses, colleges and universities, and foundations, the Forum aims to advance these efforts by creating a comprehensive, nationwide action plan to recruit and prepare students for STEM careers and to strengthen support for federal R&D.

BHEF's initiative, “Securing America's Leadership in Science, Technology, Engineering, and Mathematics,” develops and implements strategies to improve student interest and achievement in science and math, enlarge the pipeline of students pursuing STEM careers, implement institutional and systemic reforms, and enlarge and improve the teaching workforce in critical STEM disciplines. The initiative advances policy at the state and federal levels and includes a major grassroots advocacy component that brings business, education, and government together to create new partnerships and

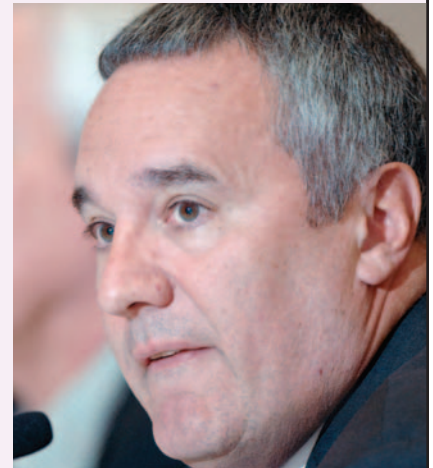
MathMovesU

Alarmed by the poor performance of U.S. students in mathematics and science—as cited in a 2003 survey published by the Trends in International Mathematics and Science Study, or TIMSS—the Raytheon Company launched a new program in November 2005 aimed at improving math and science education among middle school students.

MathMovesU is a Web-based program designed specifically to reach students in grades 6-8 whose performance in math and science is declining. It partners students with sports stars such as skateboard legend Tony Hawk, soccer star Mia Hamm, bicycle moto cross (BMX) champion Dave Mirra, and other stars. Its key objective is to combine student interest in celebrities with grant money and awards to generate new interest and excitement in math.

In addition, Raytheon has announced an annual \$1-million MathMovesU grant program that will fund classroom help for teachers, provide grants to teachers and schools to support math education, and offer scholarships to students who provide ideas on making math “cool” through the Internet.

Read more about the program at www.mathmovesu.com ■



William Swanson, Chairman & CEO
Raytheon Company

programs. Collaboration with other national organizations will also be a strong focus of the initiative.

For each critical issue, the plan proposes changes to strengthen the educational pipeline that leads to careers in STEM. These changes aim to:

- increase student awareness, interest, and achievement in mathematics and science;
- attract and graduate more students in the STEM disciplines, particularly women and underrepresented minorities;
- advance learning methods and systemic reforms that facilitate greater student achievement in mathematics, science, engineering, and technology;
- foster new methods of recruiting, training, supporting, and collaborating with K-12 teachers proficient in mathematics and science; and
- advocate and advance policy and programs that enable U.S. higher education,

private industry, and government agencies to compete in the global search for the best STEM talent.

In order to generate a national discussion on the STEM education and workforce crisis, the co-chairs of the initiative, Warren Baker and William Swanson, together with BHEF staff, have been engaged in dialogue with key policy makers and organizations, including individual members of Congress and the House and Senate STEM Caucuses, as well as U.S. Secretary of Education Margaret Spellings, who recently announced the U.S. Department of Education’s first-ever summit for girls on math and science.

Through the ACI and these other efforts, the future of math and science in America will remain a top priority for the next few years as government, academe, and business continue to work on solutions to solve the crisis that is jeopardizing the nation’s position in the new global economy.

While important steps have been taken, government and the higher education, K-12,

and business communities must do much more—together—during the years ahead for the United States to achieve the changes necessary to stay competitive on the world’s flattened playing field.

The flat world is not standing still—nor should we. ■

Editor’s Note: At its Winter 2006 meeting, the Business-Higher Education Forum (BHEF) addressed several issues that need the immediate and continued attention of national, state, and local school and government officials, business leaders, and the general public: correlations between economic growth and college enrollment; the lack of women and minorities in STEM studies and careers; and the looming teacher shortage as aging baby boomers retire.

Increased College Enrollment Key to Economic Growth

Michigan Aims to Double College Degrees

The addition of tens of millions of college graduates to the workforce in the post-World War II era served as a powerful engine of America’s unprecedented prosperity in the late 20th century. Yet, for a country that prides itself on each generation being better educated than the one before it, the United States is facing a decline in the proportion of students who actually graduate from high school and attain college degrees.

While progress has been made in preparing high school students for college, the regression from earlier trends continues to have a negative impact, says **Patrick M. Callan**, President of the National Center for Public Policy and Higher Education (NCPPE), the organization that issues national report cards on the state of higher education.

States Like Michigan Helping Students Get Into College

Among the key factors contributing to this regression, as cited in a recent report from the National Center for Higher Education Management Systems (NCHEMS), are:

- **Affordability:** Over the past decade and in America as a whole, it has become harder for people to attend college. Given the country’s changing demographics, the only way to reverse this negative trend will be to increase the number of low-income students entering and successfully getting through college.
- **College achievement and attainment:** Despite the fact that U.S. colleges and universities are considered the best in the world, studies on education conducted by the Organisation for Economic Co-operation and Development (OECD), an international forum of 30 countries addressing the challenges of globalization, indicate that the United States has

QUICK FACTS

Fact 1:
Demographic forces will add millions of minority and low-income students to the college-aged population. These students currently attend college and attain degrees at far lower rates than majority students.

Fact 2:
Educational attainment rates and workforce skill levels are projected to decrease over the next two decades.

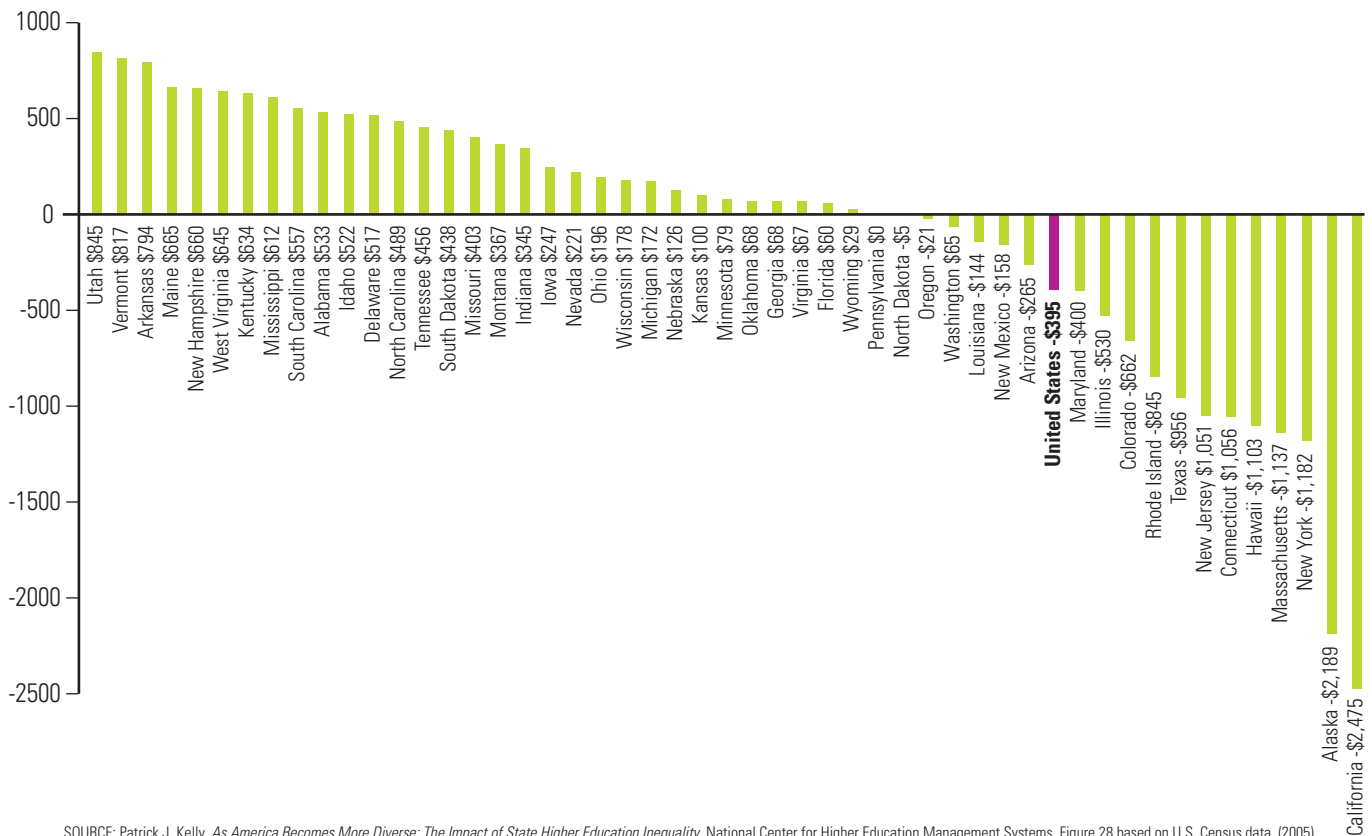
Fact 3:
Failing to increase attainment rates will result in lower per capita earnings and economic growth.



Patrick Callan

Decreases in College Completion Rates Will Result in Economic Losses for Several States

Projected Change in Personal Income Per Capita, 2000–2020 (In 2000 Dollars)



SOURCE: Patrick J. Kelly, *As America Becomes More Diverse: The Impact of State Higher Education Inequality*, National Center for Higher Education Management Systems, Figure 28 based on U.S. Census data. (2005).

been dropping steadily in college achievement and attainment.

- Student Pipeline Drying Up:** Based on measurements starting at ninth grade, flat participation and completion rates are accompanied by signs that the pipeline from schools to the workforce is drying up at all critical points. Compounding this are the changing demographics and the pending retirement of baby boomers. The replacement of these baby boomers alone constitutes a major problem. As cited in a 2005 report published by the Center for Economic Development, between 1980 and 2000, the workforce population (25- to 54-year-olds) increased by 35.1 million workers. It is anticipated that, through 2020, only three million workers will be added to that population.

The Connection Between Personal Income and Education

In the late 20th century, losses in the student pipeline did not seem to affect income growth, but in the next couple of decades, these issues will represent an enormous impediment to success in an increasingly competitive environment.

In its recent analysis, the NCHEMS was commissioned to analyze the question: What would happen to personal income if the 10-year trend of flat college access and participation continued over the next 15 years? According to Callan, if, in 2020, the country finds itself in a *status quo* situation in terms of educational attainment by race and ethnicity, the country as a whole would experience a two-percent drop in personal income, which would be “a huge

shock to the country, [a] blow to the standard of living.”

The connection between education and personal income has not been addressed with the appropriate sense of urgency it deserves, Callan said. While college graduates see personal income increasing dramatically, individuals with high school education and less are suffering a “deterioration of opportunities.” And since these individuals will compose the majority of the future workforce down the road, he underscored the need for immediate attention if the United States is to experience long-term economic growth and remain competitive in the global economy.

Minority participation and a successful educational system are “...issues [of] the common good, about the American standard of living...[about] the likelihood of main-

Lt. Governor Cherry



taining a middle class that is so essential to democratic values and institutions as we move into the 21st century,” Callan added.

Reversing the Trend: The Need for Cultural Change

But first, public attitudes must change. Take, for example, the State of Michigan. On one hand, state officials want to double the number of degree recipients in its workforce over the next 10 years in order to globalize its workforce in response to the erosion of its manufacturing base. On the other hand, 75 percent of the state’s citizens said in a survey that they do not believe that postsecondary education is important to succeeding in life.

So, given this public stance, when faced with a significant budget deficit and an ailing economy, state officials asked the citizens how they would prefer their state’s administration deal with the problem. The

citizens’ answer was clear: cut spending in higher education, a somewhat surprising response for a state with the highest concentration of manufacturing in the nation and one that is losing jobs to other countries and to advances in technology.

Michigan’s Lt. Governor John D. Cherry, Jr., said that, in contrast to Michigan, states with the highest level of educational attainment showed personal income being high and unemployment rates low.

But in Michigan, higher education has not been seen as a priority: in the public’s view, going from high school graduation directly into the manufacturing sector was “a ticket to a middle-class lifestyle, great benefits, great pay, vacation, and opportunity for a good retirement,” Cherry said.

With economic vitality being closely linked to educational achievement, the state of Michigan realized that its lack of investment in higher education has contributed to an ailing economy. Cherry said that the state must reverse this trend by making higher education one of its primary investments and by encouraging public and private institutions to work together, despite disagreements over tax policy.

As a start, and in response to public sentiment, Michigan Governor Jennifer M. Granholm appointed a Commission on Higher Education and Economic Growth in 2004 with representatives from education, business, and government. The goal: propose and implement recommendations that will transform the public’s perception of higher education. In 2005, the Commission presented three categories of recommendations: raising the bar; clearing the path; and winning the race:

■ Raising the Bar

Student participation in postsecondary education cannot be increased without fixing the front end of the student

pipeline, K-12. The Commission recommended Michigan adopt the ACT (the national college admission and placement examination) as its high school assessment test. Other states had shown that when this was done, participation levels at the postsecondary level rose.

Because dramatically increasing high school graduation requirements were also found to be key in raising the bar, the Commission recommended that the Michigan State Board of Education adopt a rigorous curriculum for the state’s high schools. This should be in place for the new school year beginning in September 2006.

■ Clearing the Path

Lack of communication among the three components of the education system—K-12, community college, and four-year baccalaureate college—is one obstacle students face in the pursuit of postsecondary education.

For example, using the ACT test will help K-12 focus on what students will need in order to prepare for the next system. “Education is a lifelong endeavor and it is time that our institutions began to reflect that,” Cherry said.

The Commission encourages collaboration among the three systems, with greater emphasis on dual enrollment. Seventeen new programs involving four-year institutions and community colleges now exist in the state. A “reverse articulation” concept will permit students who transfer from a community college to a four-year institution to use their credits to complete their associate’s degree in the event they do not pursue a baccalaureate degree.

The Commission is also working on a new lifelong education tracking system, starting at the K-12 level and covering community college and four-year institution levels, that

would make it possible to know exactly where a student is within the system. Another development would be the “transfer wizard,” by which students concurrently enrolled in several programs (four-year, community college, and online courses) can go online and find out what institutions will accept credits from other institutions.

■ Winning the Race

This country has long guaranteed every child the right to a free and public education. Over the course of 100 years or so, a high school diploma became the hallmark for one’s readiness for work, life, and citizenship. This is no longer the case, the Michigan Higher Education Commission said.

“[T]oday, a high school diploma does not indicate that you are ready for work....” Lt. Governor Cherry said. The Commission believes that the obligation set forth by the founding fathers should be extended from K-12 to K-14 or even to K-16.

In her 2006 State of the State address, Cherry said Governor Granholm called for a new merit award scholarship proposing that, upon high school graduation, every child in the state of Michigan be entitled to a \$4,000 scholarship, awarded at the completion of either an associate’s degree or the first two years at a baccalaureate institution to distinguish it from financial aid that is available to needy students.

The Commission also recommended the creation of community compacts to ensure that students have the opportunity to pursue a postsecondary education. These compacts involve private sector as well as individual financial contributions.

Recognizing that state and local economies are closely tied to how well institutions of higher education are

Member Viewpoint

“Many states, particularly those that have relied on manufacturing-based economies, such as Michigan, are now at work transforming their workforce and economy into ones that can compete in the global

knowledge-driven economy,” said **Charles M. Chambers**, President of Lawrence Tech University, an independent nonprofit institution based in Southfield, MI.



Charles Chambers

Chambers explained how economic growth benefits from increased college enrollment in a panel session that featured **Patrick M. Callan**, President of the National Center for Public Policy and Higher Education, and **Lt. Governor John D. Cherry, Jr.** of Michigan. Lawrence Tech

specializes in educational programs, applied research, and community service. ■

doing, the state created a \$2-billion investment fund called the 21st-Century Jobs Fund to provide start-up companies, small high-technology firms, and research institutions with the necessary seed capital to bring a product to the market, which will in turn bring about economic growth. These are the entities that incubate in and cluster around universities. The funds are invested in high-technology research, mainly applied research with some flexibility for basic research. New projects are expected to be funded in June or July this year. ■

Expanding America's Talent Pool in the STEM Disciplines

Women and Minorities Are Key

A recently released report by the National Academies recommends ways to attract the many more students and teachers needed in the science, technology, engineering, and mathematics (STEM) disciplines so crucial to preserving the United States' strategic and economic security.

Achieving the Academies' goals will require aggressive actions to dramatically increase the number of students from several key groups that are currently underrepresented in these crucial fields—women and minorities. At present, relatively small numbers of undergraduate women elect to major in many STEM disciplines and relatively small numbers of minorities now graduate high school academically prepared to undertake these rigorous disciplines.

According to **Gail Cassell**, Vice President for Scientific Affairs and Distinguished Lilly Research Scholar for Infectious Diseases, Eli Lilly and Company, the National Academies report, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*, recommends the following actions to address these challenges in the education arena:

K-12 Education: Increase America's talent pool by vastly improving K-12

science and mathematics education. Do this by awarding:

- 10,000 students competitive four-year scholarships to obtain bachelor's degrees in the physical or life sciences, engineering, or math, with concurrent certification as K-12 science and math teachers. In return, the students would commit to teach in public K-12 schools for five years. (Further annual bonuses would go to those teaching rural or urban underserved schools.)

QUICK FACTS

Fact 1:

Fewer minority students are prepared for college-level STEM majors and fewer choose STEM majors than white and Asian students.

Fact 2:

While persistence and completion rates for students in STEM disciplines are lower than in other majors, they are even lower for minority students.

Fact 3:

Despite progress for underrepresented minority groups, the gap between minorities and whites in degree attainment remains large, especially in STEM fields.

Fact 4:

Women remain underrepresented in STEM disciplines despite significant advances in most fields.



Gail Cassell

Member Viewpoint

Forum member Karen Holbrook, President of The Ohio State University, moderated the session on women and minorities in the science, technology, engineering, and mathematics (STEM) disciplines.

While Ohio is above the national average in graduation rates, the state is doing poorly in terms of degree attainment in higher education, Holbrook said. However, special attention is now being given, at various levels, to STEM education.

For example, the Ohio Business Roundtable is focusing on STEM this year, and Ohio Governor Bob Taft, the chancellor of the board of regents, and the superintendent of schools have formed the Science and Math Education Policy Advisory Commission to advise the state on preparing students for STEM education.

In addition, Holbrook noted the governor's January 2006 State of the State address focused on the pipeline issue of preparing students for college with a rigorous curriculum. Governor Taft also said that remediation would be moved into the community colleges and, to encourage persistence, incentives, such as future funding, would be offered for universities to graduate their students. ■



Karen Holbrook

- Matching grants for up to five years to as many as 100 universities and colleges to establish four-year undergraduate programs that integrate a degree in those fields and teacher certification.
- Grants to research universities to offer—over five years—50,000 current middle- and high school science, math, and technology teachers (with or without undergraduate degrees in those fields) two-year, part-time master's degree programs focusing on rigorous science and math content and pedagogy.

Higher Education: Make the United States the most attractive setting in which to study and perform research, so that the nation can develop, recruit, and retain the best and brightest students, scientists, and

engineers from the United States and around the world. Do this by:

- Increasing the number of U.S. citizens earning bachelor's degrees in STEM subjects by providing 25,000 new four-year competitive undergraduate scholarships each year to U.S. citizens attending U.S. institutions. These would be awarded on the basis of national exam and would provide up to \$20,000 annually for tuition and fees.
- Increasing the number of U.S. citizens pursuing graduate study in "areas of national need" by funding 5,000 new portable graduate fellowships each year.
- Providing a federal tax credit to encourage employers to make continuing education available (either internally or

through colleges and universities) to practicing scientists and engineers.

Cassell said that other action items outlined in the report included:

- Improvements in visa and immigration policies that would make it easier for international students, scholars, and people with advanced degrees in STEM subjects to enter, work, and remain in the United States; and
- Incentives for innovation, such as modernizing the patent system, realigning tax policies, and ensuring affordable broadband access, to help strengthen the nation's commitment of long-term basic research. ■

Discouraging Statistics on STEM Enrollment

Reports like *Rising Above the Gathering Storm: Energizing and Employing a Brighter Economic Future* from the National Academies have responded to discouraging statistics in science, technology, engineering, and mathematics (STEM) disciplines.

According to **Tom Price**, Senior Vice President, Operations, National Action Council for Minorities in Engineering, underrepresented minorities account for 33 percent of America's high school students in 1998 and 1999, but only 15 percent of the engineering freshmen in the fall of 1999, and only 10 percent of the baccalaureate engineering graduates in 2004.

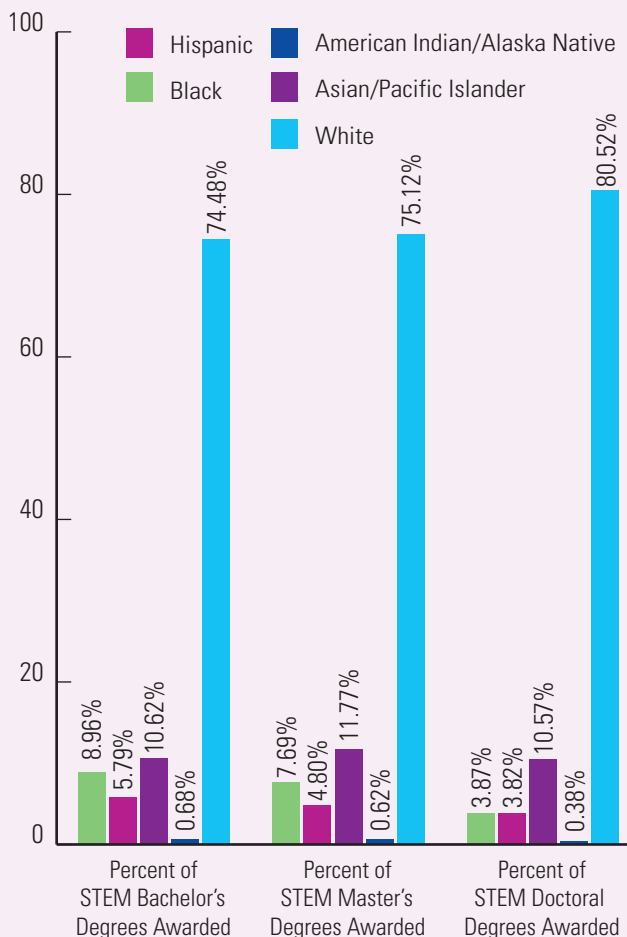
Despite progress, the gap between minorities and whites in degree attainment remains large in STEM fields. These disparities grow larger at each successive level of study, with underrepresented minorities constituting a smaller portion of STEM enrollments and degrees awarded (see graph).

Women also remain underrepresented in STEM disciplines despite significant advances in most fields. In 1999, they accounted for only 19 percent of engineering student enrollment. In 2004, the figure had dropped to 16.2 percent.

In overall graduate enrollment, women outnumber men, but they still remain underrepresented in STEM fields. Price explained that while women accounted for 58 percent of the total graduate enrollments, they represented only 38 percent of mathematics enrollments; 34 percent of physical, earth, atmospheric, and ocean sciences enrollments; 29 percent of computer sciences

White Students Dominate in All Degrees Awarded

Share of STEM Degrees by Race/Ethnicity and Degree Level, 2002-2003



SOURCE: *Digest of Education Statistics*, National Center for Education Statistics. (2004)



Tom Price

“I don't think minority kids and their families have gotten the message [yet] that they are capable... potentially talented, that the nation needs them and...will help prepare [and support] them.”

—Michael Lomax, President & CEO,
United Negro College Fund, Inc.



enrollments; and 20 percent of engineering enrollments. Women are most significantly underrepresented in the fields of engineering and computer sciences, and have made the least progress in computer science enrollment over the past 20 years.

One problem is that America's high schools are failing their students: Of nearly 3.9 million ninth-grade students in 2002, only 1.2 million will graduate high school prepared for college or for work. Of the 690,000 minority high school graduates in 2002, only four percent had the prerequisite preparation in science and

math to qualify for admission to study engineering or technology at the college level.

More properly trained teachers, more student and parental awareness of science and math careers, and more awareness of the role that communities play in preparing minority students to seek engineering degrees are needed.

The National Academies' report also underscored the importance of mentoring to help overcome the feeling of isolation that women and minorities experience in STEM programs. ■

Promising Practice: The Ohio Metro High School



In the fall of 2006 in Columbus, Ohio, the new Metro High School will open its doors to an initial group of 100 ninth-graders. The result of a collaboration between The Ohio State University, the Ohio-based global science and technology enterprise Battelle, and the Educational Council—an educational consortium of the 16 school districts in Franklin county—Metro will offer mentoring and internship opportunities for students with Battelle scientists. Located in Franklin County, Metro is part of that county's public school system. Its core curriculum, which will focus on math, science, technology, social studies, language arts, and a foreign language, will provide students with the skills to work independently and in teams while engaging in real-world problem solving.

Following its opening in 2006, Metro plans to welcome approximately 400 students from grades 9 to 12. More information on Metro can be found at www.themetroschool.org ■

Collaborating to Address the Math and Science Teacher Shortage

A State-University-Business Partnership

As the United States looks at ways to improve math and science education for all students, improving the teacher corps is one of the most critical challenges: annual teacher turnover is high, mathematics and science teachers are leaving the profession at high rates, and many current teachers lack adequate preparation in these subjects. In the face of this crisis, California has launched a major new initiative called California Teach that brings business and higher education together to deal with the crisis.

Developing the science and math teaching profession is a “very significant aspect of higher education’s responsibility,” said **Susan Hackwood**, Executive Director, the California Council on Science and Technology (CCST). “and it is also an area where partnerships with the business community can have lasting effects.”

Measuring the Problem

Of the 20,000 high school science and math teachers in California, Hackwood said, about 25 percent are deemed under-prepared or unqualified to teach those subjects.

University of California President **Robert C. Dynes**, a Forum member, said that, in his travels around the state, he was shocked at “the number of schools, in fact...the number of school districts that havenot a single credentialed science and math teacher.”

Hackwood explained that CCST studies have shown California to be excellent at innovation but poor at producing a science and technology workforce. A further study found that the answer is to produce and retain a sufficient number of science and math teachers.

QUICK FACTS

Fact 1:
Annual teacher turnover is significant and disproportionately affects children in high-poverty schools.

Fact 2:
Mathematics and science teachers leave the profession at higher rates than in other subject areas.

Fact 3:
Many teachers in mathematics and science lack adequate preparation in the subjects they are teaching.

Fact 4:
California faces a persistent shortage of qualified teachers, particularly in areas such as mathematics and science.

Susan Hackwood





Robert Dynes

Forum member **Warren J. Baker**, President, California State Polytechnic University, and co-chair of BHEF’s science, technology, engineering, and mathematics (STEM) initiative, explained, “We have to rely on teachers to encourage students to aim for math and science careers because the college and career counselors that many of us were used to when we were going to school...don’t exist today in the California schools.”

Currently, CCST is developing a critical path analysis of science and math teachers to identify the critical elements that can cause a change in the flow of teachers through the system; to suggest how to increase the quality and quantity of science and math teachers; and to look at professional development for teachers.

New Players, New Approaches

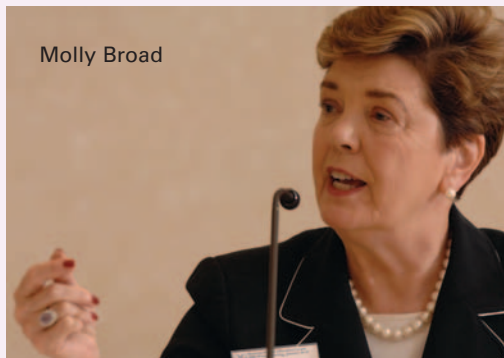
Although the California State University (CSU) has traditionally been responsible for the bulk of teacher education, Dynes explained that he plans to expand the role of the University of California (UC) in order to address the teacher shortage in the state. Developing math and science teachers requires a three-pronged program of recruitment, education, and retention, he said.



Warren Baker

Member Viewpoint

Molly Corbett Broad, former Forum member and former President of the University of North Carolina—the multi-campus university comprising 16 institutions and other educational, research, and public service organizations—noted that her state’s greatest success has been in recruiting math and science teachers from among people in mid-career who already have a baccalaureate degree. But in order to ensure that they actually stay, it is necessary to “develop a very rigorous, efficient program and to support with face-to-face and Internet mentoring,” she said.



Molly Broad

The Forum panelists reported that parts of the university system that had not traditionally been major players in teacher training are taking a larger role. And they all agreed that industry can play a major role in retaining science and math teachers by enhancing their professional standing and credentials and by refueling their enthusiasm for their subjects. ■

Recruitment

The new California Teach program encourages math and science undergraduates to explore teaching careers. According to Dynes, California Governor Arnold Schwarzenegger has committed to a loan forgiveness program for CSU and UC students who complete the California Teach program (degree and credentials) and then teach math or science for a specified number of years after graduation. This way, Dynes said, students “can actually afford to make the commitment to be teachers in California.”

Baker said that one way to attract students into teaching is to show that “teaching is not a dead end.” A student can be attracted to the loan forgiveness in return for some years of teaching, but that route will look even more attractive if the student knows he or she can get continual professional upgrading by working summers in industry or at a national lab. This way, the student will know that doors will remain open if he or she decides to leave teaching. Unfortunately, Baker said, this opportunity isn’t being presented in a systematic way during the recruitment phase.

Education

Educating these prospective science and math teachers is a problem because “we are

making it up as we go along,” Dynes said. “We need a curriculum for these students.” The tension at UC, he said, is that the math and science faculty has the passion to develop people who can teach math and science, but they don’t know how to do it. The schools of education believe they know how to do it, but they don’t often connect with these students.

Summer institutes for which students are paid while developing their teaching skills represent an important strategy for reaching these students. Industry has funded some of these, Dynes said, and it’s a good opportunity for partnership with business. Another idea is to give students time in K-12 classrooms from the start of their undergraduate careers, so that, as they

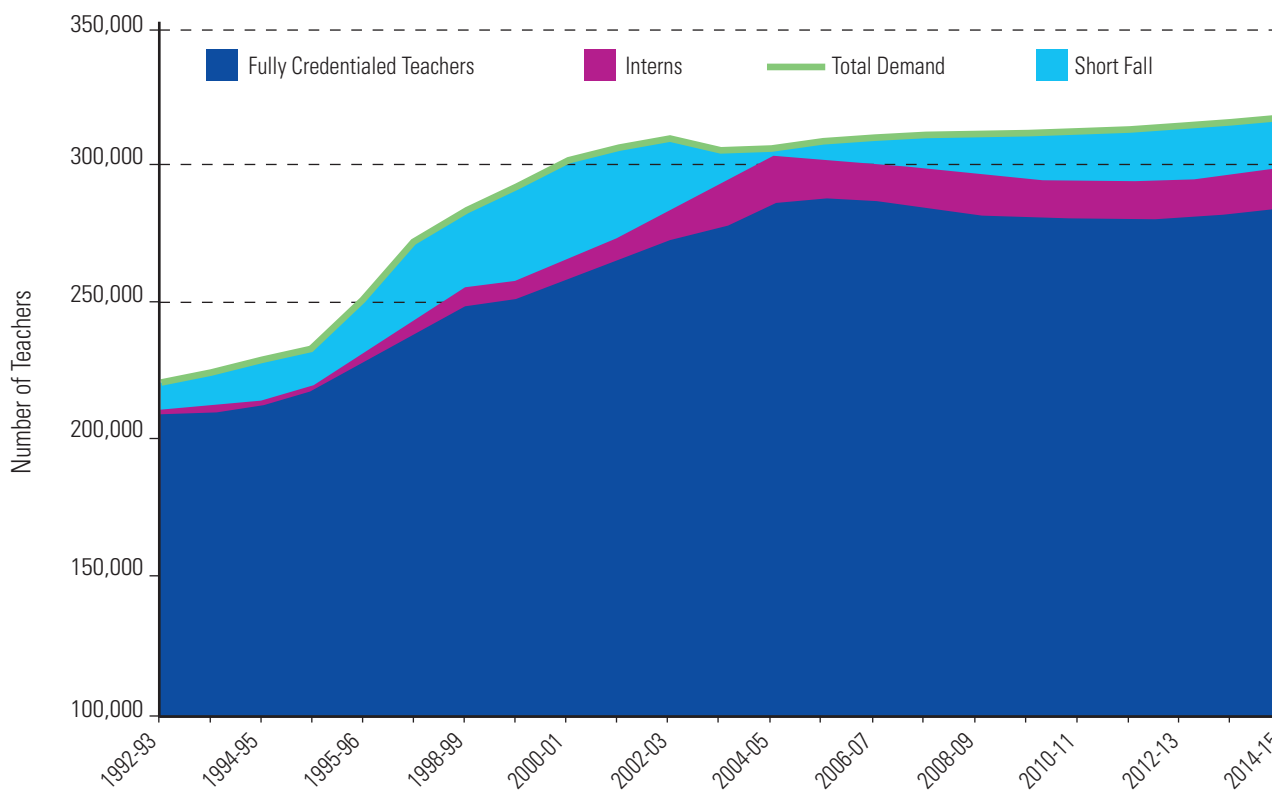
proceed in their college training, they spend time in classrooms, beginning in elementary school and ending in high school.

Baker agreed that there is a disconnect in the current system that tacks a fifth-year teacher credentialing program onto a four-year undergraduate degree. Students “certainly get no introduction to teaching while they are studying chemistry or physics or biology,” he said.

He suggested two approaches. First, create a blended program to allow students to start working toward their teaching credentials at an earlier point in their college career. The second represents an outgrowth of an Internet-based system that California State Polytechnic in San Luis Obispo has devised

Among the States, California Continues to Face the Most Severe Shortage of Teachers, Particularly in the Areas of Mathematics and Science

California K-12 Public School Teacher Workforce Through 2014-1015



SOURCE: Exhibit 4, *The Status of the Teaching Profession*. The Center for the Future of Teaching and Learning, (2005).

“Teaching is not a dead end.”

to help teachers with emergency credentials, for example, those who are not qualified to teach the subjects they are teaching. This system offers self-paced instruction and includes close faculty supervision, with a series of virtual and real face-to-face meetings. Baker suggested the system could be expanded to use in teacher training.

Baker said that his institution has only a small teacher education program, but it is becoming more involved in the field. An engineering alumnus endowed the school's Center for Science and Teacher Education with the caveat that it create a role for business and industry in the preparation of teachers, Baker said.

He lamented that many teachers lack the ability to pass on the excitement of science and math, to demonstrate its uses in everyday life, and to show it can open horizons that students have no idea about. And that's exactly what people in industry can demonstrate.

“I have been talking about this issue for over two years with our faculty in the School of Education,” he said. “I don't think...they understand what I am trying to get at. So I held out the money that we received and said, ‘You don't get it until you figure out how to bring into our teacher education program some participation from the business community.’”

Baker proposed also that the state's large system of community colleges should be recognized as one of the largest potential recruitment pools for math and science teachers, and that the state university system should expand its programs that encourage this career path.

Retention

Dynes suggested that one important way to retain teachers is to encourage and support professional development—and this is another place where industry can play a key role. He recommended programs in which teachers would spend their summers replenishing their own enthusiasm for science and technology by working at companies like Intel, Hewlett Packard, Genentech, and others.

Dynes said that 25 California corporations had committed funding—in money or internships—for teachers and students. These programs would also encourage peer recognition of teachers by scientists in industry. Hackwood said that science and math teachers want their status as highly trained individuals to be recognized, so that “it is not us and them,” she explained.

However, Dynes made it clear that retention was a huge obstacle. “We have a lot of work to do,” he said. ■

Member Viewpoint



David Maxwell

With a 95-percent success rate of having its students either begin a professional career or enter a graduate school upon earning a degree, Drake University can take pride in a mission statement that focuses on collaborative learning and the integration of the liberal arts and sciences with professional career preparation.

The University's mission is founded on the premise that an exceptional learning environment prepares students for meaningful personal lives, professional accomplishments, and responsible global citizenship—core values that are also found in the Liberal Education and America's Promise (LEAP) program launched by the American Association of Colleges and Universities (*see full article on next page*).

Over the course of history, liberal education has gone from representing the foundation of college education to being overshadowed by today's primary reason for attending college: getting a good job. “[There] is a fundamental disconnect in attitudes about the value of liberal education and our core aspirations for it,” said David Maxwell, President of Drake University. “In my 35 years of wrestling with this issue, [the] LEAP initiative holds the most promise I have seen so far of resolving this decades-old cultural disconnect between the higher education community and the constituencies whom we aspire to serve.” ■

New Campaign Stresses Outcomes of Liberal Education

Wisconsin Joins Pilot Program

Corporate and academic leaders understand the importance of the outcomes of a liberal education, but the academy needs to do a better job instilling these outcomes into the curriculum and communicating their importance to students and their parents, as well as to legislators and the general public.

In response, the Association of American Colleges and Universities (AACU), recently launched the Liberal Education and America's Promise (LEAP) campaign which advocates core outcomes, regardless of major. These include the traditional goals of liberal education—critical inquiry and reasoning, written and oral communication, ethical judgment, and civic responsibility—plus goals that prepare students for the contemporary world—scientific and technological literacy, quantitative analysis, information literacy, and cross-cultural and global learning.

Retooling Liberal Education

AACU Vice President **Debra Humphreys** explained that the campaign will

have national, state, and campus-level strands that champion the value of a liberal education for all college students.

LEAP also hopes to draw attention to the inequalities in current practices that steer low-income students to college programs that teach narrow job skills, while more advantaged students reap the full benefits of a first-rate education, she said.

Many colleges are retooling the liberal arts with “high-impact practices” such as major undergraduate research programs and capstone projects that help students integrate and apply their learning, Humphreys said. But research shows a race-based—and even more, a class-based—gap in student access to just these high-impact practices.



Debra Humphreys

Definitions Differ Off Campus

According to Humphreys, research focus groups indicate that business does not universally share the academy's definition of key liberal education outcomes. Executive- and management-level participants in these groups were interested in graduates with good problem-solving and analytical skills, teamwork skills, and importantly, oral and written communication skills. And, although they valued good work habits and commitment to hard work, they did not believe that colleges instilled them.

In addition, Humphreys said, "they were particularly dismissive of what many of us in higher education consider two very important outcomes of college: the first, greater civic engagement and commitment to community involvement; and the second, ethics and values."

In all the focus groups, she said, the participants thought that values was a subject better left to the parents—and that these were determined before the students reached college anyway. Humphreys admitted the AACU was concerned that "there was not a sense that college should reinforce a student's sense of ethics and values, help them explore their own values, help them figure out how to make value judgments in challenging situations."



Lt. Governor Lawton

Wisconsin Welcomes LEAP

Wisconsin is hosting one of LEAP's state pilot programs, and **Lieutenant Governor Barbara Lawton** said she warmly welcomed the initiative as "an opportunity to sideline partisan rhetoric and center our focus on public policy, on the real engine for smart growth and development—and that is developing an intellectually agile workforce and ethically engaged citizenry."

Obstacles abound, she warned. For a start, academia uses a "self-referential lexicon" that keeps a confused public at a distance. Further, she said academics are "utterly naïve about the political context in which they work." And alumni have been developed as donors to their alma mater, but not as advocates for liberal education.

Lawton cited Wisconsin's traditional strengths and current weaknesses to show her state was a good choice for the LEAP pilot program. Despite an impressive constellation of colleges and universities, including the world-class University of Wisconsin at Madison, Lawton admitted "we have done a miserable job of enrolling and graduating low-income and minority students." Wisconsin is becoming an immigrant state, she said. Among other things, it has a declining birth rate and is suffering a brain drain of bright college graduates. Wisconsin ranks 35th of 50 in percentage of workers over 25 who hold a bachelor's degree.

However, the University of Wisconsin and the executive branch are taking some concrete steps, Lawton said. For example:

- University President Kevin Riley will soon announce a Council on Diversity.
- The faculty is anchoring the notion of a liberal education in its syllabus for every course.

- Pre-K-16 councils in the state will supply the vehicle for setting up "a seamless way of thinking about what constitute adequate preparation to contribute in a knowledge economy."
- Wisconsin Governor Jim Doyle has asked the legislature to create a program that will guarantee affordable tuition at a University of Wisconsin campus to any eighth grader who signs a covenant agreeing to take rigorous courses through high school, maintain a B average, stay in school, and stay out of trouble.

State Funding Plummets

But without a doubt, Lawton said, a crucial problem has been the precipitous decline in state support over the past 10 years. Only 24 percent of the university budget comes from the state's general purpose revenue (GPR); half the figure of 30 years ago. The GPR contribution per full-time-equivalent student is 14 percent below the national average, ranking Wisconsin 46th of 50 states. Yet tuition has increased 40 percent in the last three years, Lawton said.

She envisions LEAP as a way to champion the values of liberal education beyond the academic community and to produce educational outcomes that enhance the state's economic future. A constituency that understands this link could move the legislature to increase its funding of and commitment to higher education, Lawton said.

LEAP will allow us to "talk about how government institutions must evolve to support us, and to redefine what constitutes information in the 21st century, so that we will not resent the investment in public education," Lawton said. The key is to ensure "that government is responsibly doing what only it can do in making those investments." ■

Effective Business-University Research Collaboration Critical to U.S. Innovation

Project Builds on Forum Initiative

Industry-university research collaborations among U.S. corporations and universities are critical today because accelerated globalization is giving companies extensive and attractive options for locating research and development (R&D) programs abroad, including sponsored research.

The new University-Industry Partnership Project—sponsored by the Government-Industry Research Roundtable, the National Council of University Research Administrators, and the Industrial Research Institute—aims to apply the recommendations in “Working Together, Creating Knowledge: The University-Industry Research Collaboration Initiative” to keep collaborations—and resulting innovation and high-quality jobs—in this country.

Business Finds Better Deals Offshore

One problem that confronts many university-industry project negotiations is disagreements about intellectual property (IP) issues. Forum member **Sean C. Rush**, General Manager, Global Educa-

tion Industry, IBM, stressed the crucial importance of IP rights. IBM’s patents (3,000 granted in 2005 alone; 45,000 in all) “fuel our ability to innovate as a company [and] our ability to develop products and services from that innovation,” he said, as well as adding revenues through licensing. Yet, offshore research collaborations frequently offer industry a better deal on this critical issue, he said.

According to **Susan Butts**, Vice President of External Affairs, The Dow Chemical Company, “In 69 percent of [Dow’s] U.S. agreements, sole university inventions remain solely owned by the university,” but outside the United States, “85 percent of sole university inventions are assigned to the sponsor or the sponsor is made joint owner of the invention.... There is a real, tangible



Sean Rush



Susan Butts

Research collaborations are important to promoting the country's innovation and a high-caliber science, technology, engineering, and mathematics (STEM) workforce.

difference in the financial impact and quality of agreements that U.S. companies can find when they work outside the United States in sponsored research," she said.

Butts, who co-chairs the University-Industry Partnership Project, also pointed out that the potential licensing fees are small compared with the support universities are receiving in sponsored research. Data from 165 universities show that in 2004, "sponsored research income was about three times greater than licensing income," she said, "...So, it is important that universities trying to maximize benefit from licensing income don't lose some of the sponsored research that they have had all along."

In addition, she said that research collaborations are important to promoting the country's innovation and a high-caliber science, technology, engineering, and mathematics (STEM) workforce. These collaborations educate graduate students so that they are prepared to take jobs in industry, she said, and they also acquaint companies with the talents and abilities of those grad students.

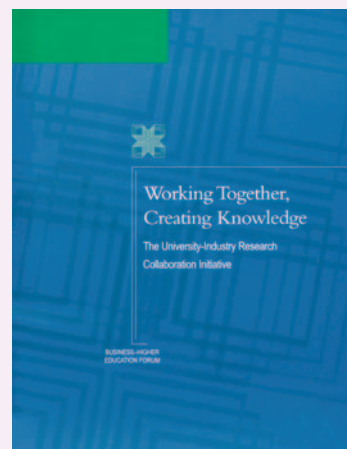
Software Will Tailor IP Terms for Projects

Butts explained that the University-Industry Partnership Project aims to translate the recommendations of the "Working Together, Creating Knowledge" initiative into tools "that can be used by the people who actually negotiate research agreements." IP issues top the Project's agenda.

One product currently under development is a software program called TurboNegotiator that business and university negotiators can use to find appropriate IP terms for their particular collaboration. Every collaboration is different, Butts said, so boilerplate contracts don't work. This software package includes a questionnaire developed "to get each partner to listen to the other one" and fully understand their creative and tangible contributions, she said. The questionnaire should "point the two potential partners to a common understanding of what the project is all about," Butts said.

Based on the nature of the research, what the partners contribute, and the likelihood of patents resulting, the projects would fit into different categories, she explained. The software program would show the different sets of IP terms appropriate for different categories of projects, and these should provide the starting point for negotiations, Butts said. The Project has also collected 12 "living studies" detailing both successful and failed collaborations and analyzing why they did or didn't work.

For more information on the University-Industry Partnership Project, visit http://www7.nationalacademies.org/quirr/CURRENT_IP.html



"Working Together, Creating Knowledge: The University-Industry Research Collaboration Initiative"—the BHEF report on research collaboration released in 2001—documents "best practices" and develops guidelines for conducting university-industry research partnerships that can serve as an instructive model for both sectors as well as for public policy makers. The report sets forth recommendations for improving the quality and quantity of university-industry collaborations and addresses issues that challenge partnerships between industry and universities, such as:

- Intellectual property
- Licensing
- Conflicts of interest
- Confidentiality
- Indirect costs
- Background rights

The full report is available at <http://www.bhef.com/initiatives/#university>

A Tribute to Eugene O'Kelly

"I'll be glad if my approach and perspective might provide help for a better death—and for a better life right now."

—Eugene O'Kelly



Eugene O'Kelly, Chairman and Chief Executive of the accounting firm KPMG International, joined the Business-Higher Education Forum (BHEF) in 2002. A very talented executive and an outstanding volunteer, he was widely admired and respected for the energy and the commitment that he brought to the BHEF and to the many other business, philanthropic, and charitable organizations to which he was devoted.

In the spring of 2004, O'Kelly was diagnosed with late-stage brain cancer. He knew that his days were counted. That precious time became the most inspirational and spiritual time of his life. Working with his wife, Corinne, and writer Andrew Postman, he set out to chronicle his attempt to face death. In *Chasing Daylight: How My Forthcoming Death Transformed My Life*, O'Kelly is a mentor. His advice: Confront your own mortality, sooner rather than later.

In a letter addressed to members of the BHEF, now-KPMG Chairman and Chief Executive Timothy P. Flynn wrote: "Gene O'Kelly faced his illness and pending death with great purpose and strength. He inspired all of those he came in contact with during this phase of

his life. It was through this inspiration that he was encouraged to write about what he called his gifts, 'I was told I had three months to live.' This led to his writing a poignant, inspirational memoir that reminds us to embrace life's perfect moments—the fragile, fleeting time we have with our family, our friends, and even ourselves."

Gene O'Kelly passed away on Sept. 10, 2005. He leaves behind his wife, Corinne, and their two daughters, Marianne and Gina.

The members of the BHEF express their deepest sympathy to Eugene's family. He will remain in our thoughts always. ■

The Forum Welcomes New Members



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The College Board



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President,
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Susan Clark-Johnson
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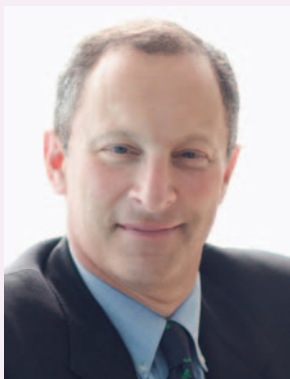
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*Titles and affiliations reflect positions held
at the time of the meeting.

2006-2007 Meeting Dates and Venues

Summer 2006: June 7-8, Washington, DC

Winter 2007: Jan. 11-12, San Diego, CA

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Read about the Forum's initiative on science, technology, engineering, and mathematics (STEM) education, *Securing America's Leadership in Science, Technology, Engineering, & Mathematics*, in its newly released brochure (see page 9 of this issue).

Copies of the brochure are available upon request.

All BHEF publications are free-of-charge and can be viewed as Adobe PDFs at <http://www.bhef.com/publications/>



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