BEST
Building Engineering
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The Quiet Crisis:

Falling Short in Producing American Scientific and Technical Talent

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BEST is a public-private partnership dedicated to building a stronger, more diverse U.S. workforce in science, engineering and technology by increasing the participation of under-represented groups.

A quiet crisis is building in the United States. There is a rapidly growing imbalance between supply and demand of technically skilled workers.

The Quiet Crisis

Falling Short in Producing American Scientific and Technical Talent

There is a *quiet crisis* building in the United States — a crisis that could jeopardize the nation's pre-eminence and well-being. The crisis has been mounting gradually, but inexorably, over several decades. If permitted to continue unmitigated, it could reverse the global leadership Americans currently enjoy.

The crisis stems from the gap between the nation's growing need for scientists, engineers, and other technically skilled workers, and its production of them. As the generation educated in the 1950s and 1960s prepares to retire, our colleges and universities are not graduating enough scientific and technical talent to step into research laboratories, software and other design centers, refineries, defense installations, science policy offices, manufacturing shop floors and high-tech start-ups. This "gap" represents a shortfall in our national scientific and technical capabilities.

The need to make the nation safer from emerging terrorist threats that endanger the nation's people, infrastructure, economy, health, and environment, makes this gap all the more critical and the need for action all the more urgent.

We ignore this gap at our peril. Closing it will require a national commitment to develop more of the talent of all our citizens, especially the under-represented majority - the women, minorities, and persons with disabilities who comprise a disproportionately small part of the nation's science, engineering, and technology workforce.

The American public has not focused on the *quiet crisis* because we have grown accustomed to the fruits of technology. The technological advances of the past 100 years created a cornucopia of riches that have dramatically altered the quality and nature of daily life. Few Americans can remember life before electricity and electronics; ground, air, and space transport; radio and television broadcast; telephonics and satellite communications; medical technologies and imaging for diagnostics, treatment, prevention, and health assurance; laser and fiber optic, petrochemical, and nuclear technologies.[1]

A Golden Age of Prosperity

The U.S.-led surge in information technology that began in the early 1990s fostered a shared sense that prosperity could be taken for granted. Then-new technologies such as the World Wide Web, e-mail, and reasonably priced microprocessors boosted American productivity and spread rapidly through most segments of the economy. Life for many Americans was comfortable, safe, healthy, convenient, relatively wealthy, and thoroughly endowed with choice and consistency. The golden continuity of prosperity — together with the break-up of the Soviet Union and the triumph of market-based economics — signaled a new millennium in which the foundation of U.S. strength could be assumed.

The assumption of continued progress — even American invincibility — was shattered on September 11, 2001. The hard questions that have been asked since then have centered on the immediate capacity of the nation to fight terrorism. But the current natural focus on intelligence capabilities and defense preparedness should not overshadow the most fundamental of questions. Is the United States developing the human capital to remain the world's most productive economy while at the same time meeting a formidable new national security threat?

The Council on Competitiveness, which for 15 years has studied the capacity of the nation to support high-wage jobs and win in global markets, has shown how much scientific and technical talent contribute to national economic performance.

Greatest Engineering Achievements of the 20th Century[1]

1. Electrification
2. Automobile
3. Airplane
4. Water Supply and Distribution
5. Electronics
6. Radio and Television
7. Agricultural Mechanization
8. Computers
9. Telephone
10. Air Conditioning and Refrigeration
11. Highways
12. Spacecraft
13. Internet
14. Imaging
15. Household Appliances
16. Health Technologies
17. Petroleum and Petrochemical Technologies
18. Laser and Fiber Optics
19. Nuclear Technologies
20. High-performance Materials

[1]*Greatest Engineering Achievements of the 20th Century*, National Academy of Engineering, www.greatachievements.org/greatachievements/indexp.html.

The U.S.' lengthy economic boom has hidden the fact that there is not enough technical talent in the pipeline to replace enough of the skilled labor responsible for our country's prosperity.

The Council's regression analysis and quantitative modeling pinpoint a few critical factors that correlate highly and positively with economic strength. They include:

- The size of the labor force dedicated to research and development and other technically-oriented work;
- The amount of investment directed at research and development;
- The resources devoted to higher education; and
- The degree to which national policy encourages investment in innovation and commercialization.[2]

Council researchers also identified a growing number of countries capable of world-class innovation. Beyond Japan and Europe's major economies, the Scandinavian countries have emerged since the mid-1980s as new centers of innovation. Singapore, Taiwan, South Korea, Ireland, and Israel have also made great strides in developing high-value products and services.

All of these innovative economies — and others including India, China, and Malaysia that aspire to reach world-class level — are ramping up capacity to educate, train and deploy scientific and technical talent. The overseas pool of scientists and engineering talent is increasing briskly, the quality of patents by foreign inventors is strong, global access to capital is growing, and global information infrastructure is expanding at a rapid pace.[3]

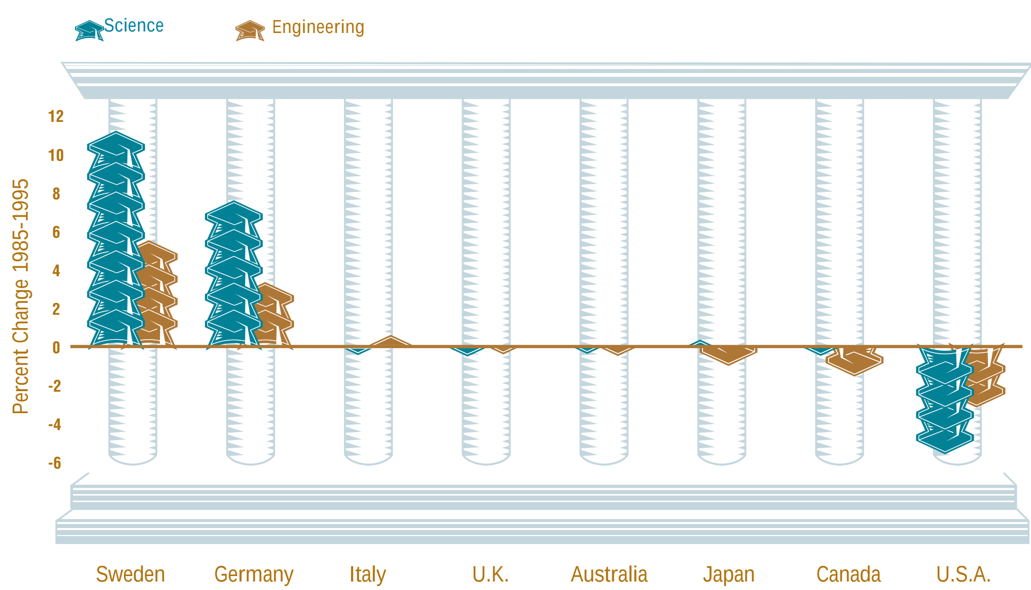
These new realities are at the heart of the quiet crisis because they call American economic pre-eminence into question at a time when it is vitally needed.

Success Masks Vulnerability

While the U.S. has the strongest national economy with the largest per-capita income, its success masks a critical vulnerability. At home, the source of the innovative capacity and technological ability is thinning. A quarter of the current science and engineering workforce – whose research and innovation generated the economic boom in the 1990s – is more than 50 years old and will retire by the end of this decade.[4]

The Proportion of Science and Engineering Degrees Rose Abroad While Declining in the United States

Change in Science and Engineering Degrees as a Percent of First University Degrees 1985-95



Source: NCES, International Education Initiators: A Time Series Perspective, 1985-95, February 2000.

This cohort is not being replaced in sufficient numbers. For two decades, the U.S. college-age population declined by more than 21 percent, from 21.6 million in 1980 to 17 million in 2000.[5] According to data compiled by the National Science Board, graduate and undergraduate student populations in engineering and the physical sciences — despite a recent upturn — remain below levels reached in the early 1990s[6]. The same trend holds true for undergraduate and graduate degrees granted to American students in these disciplines. The only positive long-term trajectories are in the life sciences.

Yet mathematics, physics, chemistry, computer sciences, and engineering will be decisive in the war against terrorism and the maintenance of economic prosperity. These are the very disciplines that support U.S. leadership in the information revolution — a vital asset in national

[2] Porter, Michael E. and Stern, Scott. *The New Challenge to America's Prosperity: Findings from the Innovation Index.* Council on Competitiveness, Washington, D.C., 1999.
[3] Benchmarks from the U.S. Competitiveness 2001. Council on Competitiveness. Washington, D.C.
[4] National Science Board. *Science and Engineering Indicators 2000.*
[5] Ibid.
[6] National Science Board. *Science and Engineering Indicators 2000* and *Data Brief, Division of Science Resource Statistics*, National Science Foundation, December 21, 2001.

The structural imbalance between America's need for, and production of, scientists and engineers, together with the risks and uncertainties of relying on imported talent, should give real urgency to the question, "who will do science in the new millennium?"[10]

security and the civilian economy. They are also emerging as integral to the future of the life sciences, which will remain drivers of societal well being and the nation's first line of defense against bio-terrorism. Equally, these are the disciplines that drive innovation in the pivotal energy sector.

Challenge of Under-representation in Science, Engineering, and Technology Occupations by Race/Ethnicity

Breakdown of Science and Engineering Professionals

Percent Distribution by Race/Ethnicity

Highest Degree Held	Total	African American	Asian	Caucasian	Hispanic	Native American
Doctorate	593,700*	3.6%	17.6%	76.7%	2.1%	0.0%
Master's Degree	1,155,700*	3.1%	16.5%	76.9%	3.3%	0.2%
Bachelor's Degree	3,223,700*	7.2%	12.6%	76.2%	3.7%	0.3%
Associate's Degree	657,000*	11.6%	5.7%	80.0%	2.1%	0.5%
High School Diploma	1,657,000*	11.3%	4.4%	77.8%	5.5%	1.0%
Grand Total	**7,287,100***					

Source: Current Population Survey, April 2001
*Rounded to the nearest 100.

Demand for Technical Talent Remains Strong

While trend lines in physical science and engineering remain flat or in decline, the demand for technological workers is expanding — even in a weak economy. By the year 2008, according to projections by the U.S. Department of Labor, jobs requiring technical degrees are projected to grow at three times the rate of occupations in general. An estimated 6 million job openings are projected for technically trained workers between 1998 and 2008, the majority of them in computer, mathematics, and operations research; medical and health technology; and engineering.[7] Before the end of this decade, the United States is expected to create about 2 million new jobs in science and engineering.[8] There are currently 600,000 job openings in information technology alone.[9]

These trends and projections have not made headlines. The crisis is quiet because the nation has yet to feel the pinch. When domestic talent has been unavailable or underutilized, American industry has turned to foreign workers on H1B visas to fill the gap — as many as 195,000 per year. By the same token, U.S. research universities have educated some of the best and brightest science and engineering students from around the world — and are relying on significant numbers of them to fill faculty positions.

Although the U.S. capacity to attract top talent from abroad remains a major source of strength, a risk assessment perspective is useful here:

First, reductions of as little as 5 to 10 percent in the availability of H1B visas could contribute to industrial vulnerability. A reduction of 20,000 workers may be a small number, but given the sensitivity of some of the positions and the expertise required, it can have significant impact on industrial competitiveness.

Second, the quality of science and engineering education overseas is improving rapidly, as are opportunities to use this training. What if the best and brightest no longer come to the United States or return home in growing numbers?

Third, in the aftermath of September 11, the inflow of foreign talent may be constrained by security concerns. The current overhaul of U.S. visa and immigration policies will — at a minimum — tighten enforcement. It may also change the rules.

The structural imbalance between America's need for, and production of, scientists and engineers, together with the risks and uncertainties of relying on imported talent, should give real urgency to the question, "who will do science in the new millennium?"[10]

Under-represented Groups Must Become Integral Part of Technical Workforce

The response to this fundamental question is clear. The United States must look increasingly within its emerging demographics. Today's workforce of scientists and engineers no longer mirrors the national profile. White males comprise nearly 70 percent of the science and engineering workforce, but just over

[7]Council on Competitiveness, *U.S. Competitiveness 2001.*
[8]National Science Board. *Science and Engineering Indicators 2000.*
[9]META Group survey based on an annual survey of 500 large American companies. As reported in *The New York Times,* June 15, 2001, *"Technology Briefing: People: Job Market Remains Tight,"* by Barnaby J. Feder.
[10]Pearson Jr., Willie and Chubin, Daryl E., *Scientists and Engineers for the New Millennium: Renewing the Human Resource, Commission on Professions in Science and Technology, 2001.*

Challenge of Under-Representation in Science, Engineering and Technology Occupations by Gender

Highest Degree Held	Number	Percent Male	Percent Female
Doctorate	593,713	79.1%	20.9%
Master's Degree	1,555,659	71.6%	28.4%
Bachelor's Degree	3,223,664	75.6%	24.4%
Associate's Degree	657,444	74.1%	25.9%
High School Diploma	1,657,135	72.2%	27.8%
Grand Total	7,287,615	74.3%	25.7%

Source: Current Population Survey, April 2001

40 percent of the overall workforce. White females, on the other hand, make up about 35 percent of the overall workforce, but no more than 15 percent of the science and engineering workforce.[11] Similar disproportion holds true for African Americans, Hispanics, Native Americans, and persons with disabilities who make up 24 percent of the population, but only 7 percent of the science and engineering workforce.[12] Taken together, women and under-represented groups make up a half to two-thirds of the population of the United States and comprise the nation's new majority.

Far larger numbers of scientists and engineers must come from the talent pool comprised of this new majority – not to displace any group, but to expand our capacity to innovate within a framework of inclusiveness and opportunity for all.

The challenge of under-representation has been a focal point of research and action for nearly three decades. Scores of nonprofit organizations and scholars across the country have championed the cause, making limited headway with scarce resources. A number of federal agencies have invested substantially in "upping the numbers." None of these efforts, however, has captured the full attention of national leaders or energized the American public.

A sign of increased readiness to meet the challenge found expression in a recent Congressional Commission on the Advancement of Women and Minorities in Science, Engineering, and Technology Development. The report of the Commission, *Land of Plenty: Diversity as America's Competitive Edge in Science, Engineering, and Technology*, marked a significant shift in the framing of the challenge.[13] The case for bringing traditionally underserved groups into the mainstream had been made earlier largely in terms of affirmative action. *Land of Plenty,* along with other reports, moved beyond this rationale by recognizing that it no longer is appropriate to consider under-representation in our society merely a social problem or a moral imperative. It is now an economic problem and a national imperative.

Land of Plenty spells out issues that must be addressed along the full continuum of workforce development to increase the participation of under-represented groups. These start in grades pre-K through 12, where an alarming number of African American, Hispanic, and Native American youngsters start behind and stay behind. Only a relative handful graduate with skills needed for further study of science and engineering. Girls, who complete high school with the same achievement in mathematics and science as boys, nonetheless face a host of pressures that deter many from continuing further. Under-represented groups that stay the course to higher education drop out of science and engineering majors in disproportionate numbers. Comparable problems of retention and advancement persist in graduate school and beyond.

Consequently, under-represented groups do not participate in the science and engineering labor force in proportion to their numbers in the overall population or labor force. If the intellectual talent inherent in this new majority were identified, nurtured, and encouraged, the projected gap of scientists and engineers would be filled.[14]

Historical Precedent

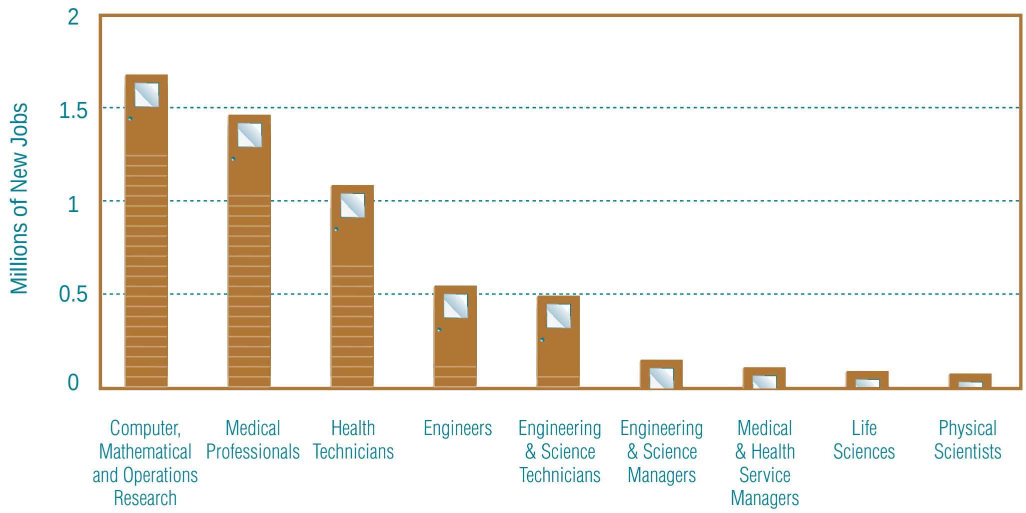
The United States has risen to meet comparable challenges before. Whenever we have, economic and national security interests invariably have converged to marshal resources and build strength.

The 1940s marked a growing awareness that the nation's fortunes were tied to its commitment to science, and that the security and prosperity of the nation rested, literally, on ushering more youth into the science, engineering, and mathematics pipeline. In 1944, President Franklin D. Roosevelt commissioned a high-level review of the organization of scientific research and the support of scientific education in the United States, and the consideration of what form it should take in the post-World War II environment. The review was led by Dr. Vannevar Bush, who headed the Office of Scientific Research and Development (OSRD), which played a key role in World War II.

[11]Council on Competitiveness, *U.S. Competitiveness 2001.*
[12]National Science Board. *Science and Engineering Indicators 2000.*
[13]*Land of Plenty: Diversity as America's Competitive Edge in Science, Engineering and Technology* Washington, D.C., September 2000.
[14]Ibid.

Six Million Job Openings Are Projected for Technically Trained Talent

Projected Number of Job Openings by Technical Field, New Jobs, and Net Replacements, 1998-2008



Source: Bureau of Labor Statistics, www.bls.gov

Dr. Bush's report, *Science –The Endless Frontier,* made the case for long-term national investment in scientific research and education in the interest of the future well-being of the United States. "Scientific progress," wrote Dr. Bush, "is one essential key to our security as a nation, to our better health, to more jobs, to a higher standard of living, and to our cultural progress." Progress to this end, according to Dr. Bush, required a partnership with what became today's research universities, through support of basic research, and especially through the education and training of a scientific workforce.

The success of the effort that followed became a model replicated several times whenever the nation perceived that its security might be compromised. When Cold War tensions arose in the late 1940s, President Harry Truman reiterated the critical role of science in defense of our national security and the arms race. A decade later, in 1957, the Soviet Union launched the first earth satellite, Sputnik. Propelled not only by the arms race but also a space race, the nation rallied behind science and mathematics education as never before, focusing its efforts on nurturing youthful talent. So encouraging was the atmosphere that President John F. Kennedy, in 1961, set a goal of landing man on the moon by the end of the decade — a challenge the nation met, in 1969, with the Apollo 11 mission.

The renewal of a post-Cold War threat to U.S. interests has sharpened the national focus on issues related to the scientific workforce. Federal government and quasi-government agencies including the National Research Council (NRC), the National Science Foundation (NSF), the National Academy of Sciences (NAS), and the Government/University/Industry Research Roundtable (GUIRR) have studied the issue and are calling for action.

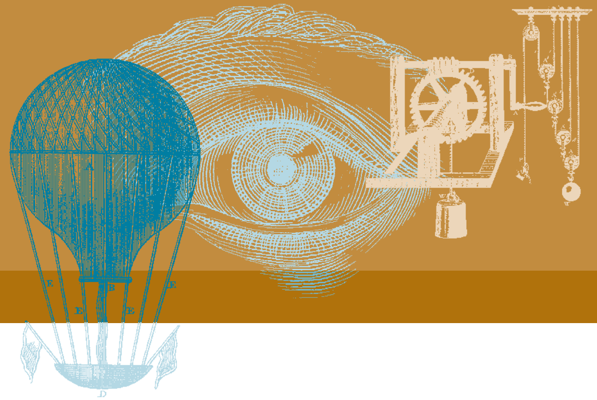
Our Educational Foundation Needs Support

A growing number of university leaders have acknowledged their responsibilities toward improving a pre-K through 12 mathematics and science feeder system that does not measure up to the nation's needs. They are joined in this arena by major foundations and corporations that recognize the scale of the challenge and are ready to do their part in meeting it.

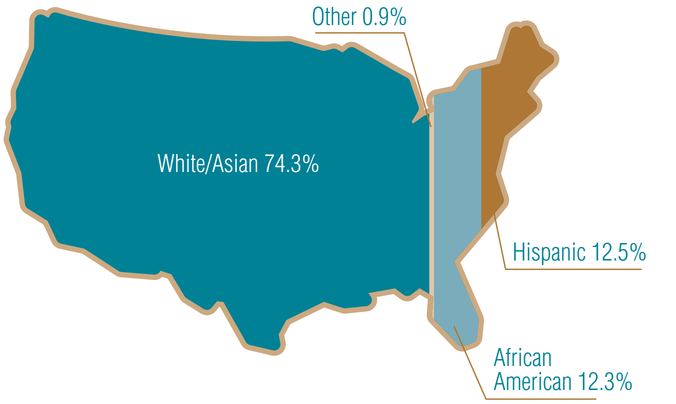
This change in national mood opens up a rare opportunity for Building Engineering and Science Talent (BEST), the public-private partnership that was incorporated a week before the attacks on the Pentagon and the World Trade Center. The establishment of such a partnership had been proposed a year earlier in the *Land of Plenty* report. BEST's three-year mission is to develop and execute a national action plan to increase the participation of the "under-represented majority" — women, minorities, and persons with disabilities — in technical fields.

BEST Can Help Overcome the Quiet Crisis in Several Important Areas

Best Practices The nation needs to know what is really working in elementary and high school mathematics, freshman physics and chemistry, graduate schools, and corporate R&D teams to develop — and draw upon — the talent of under-represented groups. The same wheels are being re-invented and the same mistakes made on a daily basis in every part of the country. Authoritative, readily accessible information on best-in-class and exceptionally promising programs, lessons from

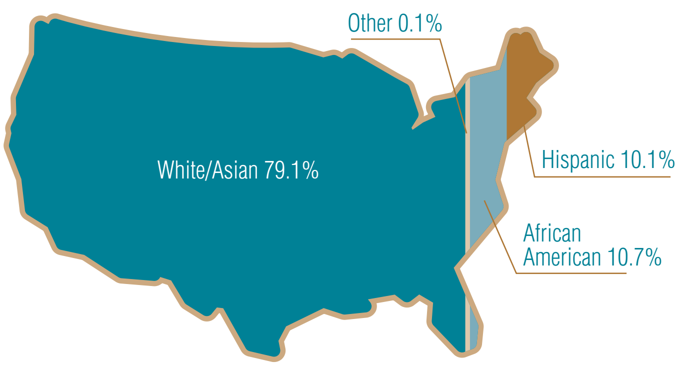


Overall Population
(Working & Nonworking)



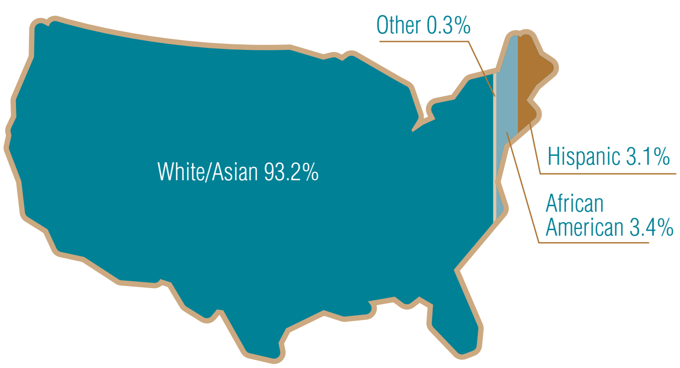
Source: 2000 Census

U.S. Workforce



Source: *Women, Minorities, Persons with Disabilities,* National Science Foundation , 2000

Science & Engineering Workforce



Source: Bureau of Labor Statistics, 2000 www.bls.gov

success and failure, and insights into scaling up would be of great value to employers, educators, parents, and students. BEST has organized blue ribbon panels of nationally recognized experts in pre-K through 12, higher education, and workforce development to make these judgments.

Community Engagement BEST will take its knowledge and insights to communities. The *quiet crisis* must be addressed by leadership from the bottom up, as well as the top down. Civic leaders need practical advice on the ground. For example, BEST might provide a comprehensive checklist that enables a community to assess its capacity to develop a more diverse technical workforce. Based on its command of outstanding programs and their costs, BEST could go beyond this to help a community set and implement priorities.

A National Strategy BEST will link the widely shared understanding that U.S. interests are at risk with the specific requirement of building a stronger, more diverse pool of U.S. scientific and technical talent. The link has to be made at the national level by developing an agenda that galvanizes leaders from government, industry, education, professional societies, and the foundation community. There is no substitute for national leadership to generate the will and the resources needed to make serious headway over the next decade. As is the case with the war on terrorism, there is no quick fix for the challenge of under-representation. Equally, there is a parallel need for a cohesive national strategy. A national strategy requires a compelling vision, clear objectives, and actionable priorities.

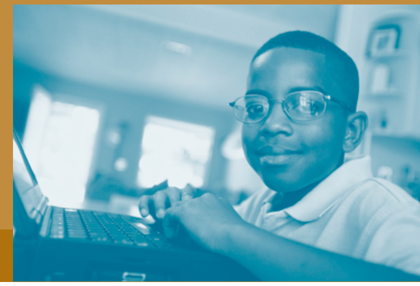
The vision that I find compelling is one of affirmative opportunity to develop the scientific and technical talents of every child in America.

The objective that makes sense is to create a scientific and technical workforce that reflects the changing face of America.

Priorities for Action

Many of the priorities and action steps needed to develop a national strategy will emerge from an assessment by BEST of what is and is not working. As the blue ribbon panels convened by BEST chart the way forward in pre-K through 12, higher education, and the workplace, they will frame recommendations for all of the sectors that have leadership roles to play at the national level. The following framework provides a starting point.

The nation needs to know what's really working in elementary and high school mathematics, freshman physics and chemistry, graduate schools and corporate R&D teams to develop – and draw upon – the talent of under-represented groups.



Priorities for the Federal Government

Congress and the executive branch must lead on the issue of under-representation. This will involve giving voice to the national need – and backing that voice with direction and resources. Four priorities stand out:

Maximize the Value of Current Programs The National Science Foundation, Department of Education, Department of Defense, Department of Energy, NASA and other agencies have longstanding records of commitment to under-represented groups. But federal resources are scattered and would have greater impact if they were more closely aligned. An inter-agency initiative to insure such alignment would enhance both the effectiveness and credibility of federal investment.

Other national programs, such as the National Teachers Corps which recruits up to 75,000 qualified teachers annually to serve in high-need schools, should be expanded and strengthened with such measures as including subsidies for the acquisition of teaching credentials.

Consider a Bold Federal Initiative While such programs are important, it may be even more worthwhile to consider a bold initiative similar to the National Defense Education Act of 1958, when Congress found "that an educational emergency exists and requires action by the federal government."[15]

Leverage Federal Dollars Federal investments to develop a stronger, more diverse talent pool should not stand alone, but should be matched by states and local communities. The 25 states in which minorities make up at least 25 percent of the pre-K through 12 student population deserve priority attention.

Increase Investment Congress and the executive branch cannot just re-divide the pie, but must allocate fresh resources to expand educational opportunities in mathematics and science for under-represented groups. Important new initiatives, such as NSF's five-year $1 billion Mathematics and Science Partnerships, should represent net increases in investment. Programs that have a track record of proven value should be expanded. New investments that promise to make a real difference, such as Pell-like financial aid grants for under-represented students in science and engineering majors, deserve serious consideration.

Priorities for Education

Research universities have a special leadership responsibility. Not only are they strategically positioned between pre-K through 12 and the workplace, but they will educate the successor generation of American scientists and engineers. The list of "must-do's" for research universities should include:

Strengthen the University Presence in Pre-K Through 12 Mathematics and Science Education The crown jewels of the nation's educational institutions must engage far more intensively in the feeder system. One model that is producing results entails adopting students from low-income school districts from 7th through 12th grade. These students receive advanced instruction in algebra, chemistry, physics, and trigonometry, as well as mentoring and college financial planning seminars for students and their parents. Such models should be shared among research universities, adapted as needed, and scaled nationwide. At the same time, universities should develop alternatives to the traditional admissions process to ensure that the abilities of prospective students from under-represented groups are fairly and accurately assessed.

Nurture the Undergraduate and Graduate Education of Under-Represented Groups Slowing the attrition of women, African Americans, Hispanics, Native Americans, and students with disabilities will have the greatest immediate impact on the science and engineering talent pool. The causes of such attrition are understood and models exist for mitigating such attrition. The problem must be addressed by the presidents, deans, department chairs and tenured faculty who have the authority to change the learning environment.

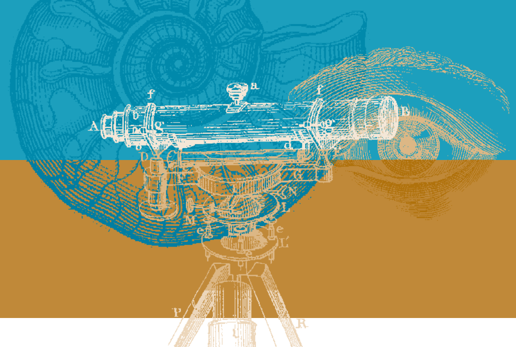
Expand Faculty Diversity One of the greatest barriers to increasing the production of under-represented groups is the absence of role models — both in teaching and in research. Leaders of the nation's research institutions must commit jointly to transform the composition of their junior and tenured faculties.

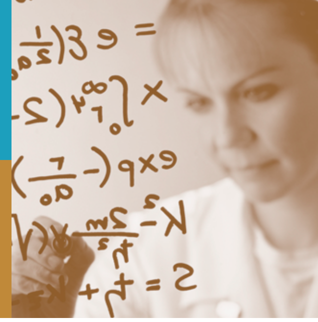
Priorities for Industry

Internationally competitive companies are the U.S. economy's greatest assets, but many also face high-stakes choices between going global or strengthening both their R&D and production bases at home. The commitment of these companies to develop and utilize more homegrown science and engineering talent is indispensable. Their agendas should include:

Strengthen the Corporate Presence in Pre-K Through 12 Mathematics and Science Education Although some of the nation's most prominent corporate leaders have set leadership examples, industry's commitment must become a norm across the board. The professional development of mathematics and science teachers in middle school and high school is a logical

[15] National Defense Education Act of 1958, Title I.





focal point. In addition, discipline-based teacher models that enable scientists and engineers to transition from industry into teaching have great potential value.

Embed Diversity in R&D Partnerships With Universities Companies that invest in university-based research should make clear that increased diversity would enhance the value of collaboration, and that diversity is a criterion that routinely will affect the selection of future partners. Statements by the nation's leading industry groups underscoring this point would send a powerful message.

Create a Culture of Inclusiveness in the Workplace Although the business case for diversity is widely accepted, an energetic recruiting policy falls far short of what is needed to enable scientists and engineers from under-represented groups to contribute to the full measure of their abilities. Attention at the highest executive levels is a necessity in companies large and small.

Priorities for Non-Profit Organizations

Foundations, professional societies, and the institutional advocates of under-represented groups have an important role to play at the national level. Aligning their efforts is a challenge all its own, but it is essential that leaders of these varied organizations work together to advance common interests. Their collaboration should focus on two main priorities:

Project a More Positive Public Image of Science, Engineering, and Technology Making technical careers more attractive to all Americans, especially the under-represented, is a prerequisite of meaningful long-term progress. A coalition of foundations, professional societies, and other allied groups could bring powerful assets to bear in any such undertaking – financial resources and national outreach to millions of concerned individuals.

Mobilize at the Grass Roots More professional societies of scientists and engineers should put diversity front and center on their agendas, taking active roles in helping university departments reduce attrition and prepare future faculty. Correspondingly, foundations could produce a national multiplier by making mathematics and science more prominent in their focus on school reform.

When the critical nature of the nation's need for adequate science and engineering capability is understood fully and when the national will is engaged, the United States can and will gather the resources to rebuild that workforce. With the national will engaged to resolve this *quiet crisis*, and with strong leadership, the nation will assure its own vitality, **security**, and future.

BEST Blue Ribbon Panelists

Best Practices in Pre-K Through 12 Education

Alfred Berkeley (Panel co-Chair)
Vice Chairman
NASDAQ

Shirley Malcom (Panel co-Chair)
Head, Education Directorate
American Association
for the Advancement of Science

Eugene Garcia (Expert Leader)
Dean, School of Education
Arizona State University

Allan Alson
Superintendent
Evanston Township High School

Raymond V. "Buzz" Bartlett
President and CEO
Council for Basic Education

Muriel Berkeley
President
Baltimore Curriculum Project

Susan Brady
Director, Education Programs
Merck Institute for Science Education

Manuel Berriozábal
Professor, Mathematics
University of Texas at San Antonio

Costello Brown
Director, Division of Educational System Reform
National Science Foundation

Patricia Campbell
President
Campbell-Kibler Associates

Douglas Carnine
Director, National Center to Improve the Tools of Educators
University of Oregon

Elizabeth Cohen
Professor Emerita
Stanford University

Mike Cohen
Senior Fellow
Program on Education
in a Changing Society

Anthony Colón
Vice President
National Council of La Raza
Center for Community Educational Excellence

Jacquelynne Eccles
Chair
MacArthur Foundation Research Network on Successful Pathways through Middle Childhood

Charles Eilber
President
Charles Eilber Associates

Stephanie Fanjul
Director of Student Achievement
National Education Association

Yolanda George
Deputy Director and Program Director
Directorate for Education and Human Resources Programs
American Association for the Advancement of Science

Kris Gutierrez
Professor
UCLA

Rebecca Herman
Senior Research Analyst
American Institutes for Research

Paquita Holland
Former Principal
Oyster Bilingual Elementary School

Anthony Jackson
Vice President, Strategic Development and Communications
The Galef Institute

Julia Lara
Deputy Executive Director
Council of Chief State School Officers

Leon Lederman
Nobel Prize Winner
Physics

Babette Moeller
Principal Investigator
Education Development Center

Andrea Prejean
Assistant Professor of Education
American University

Linda Rosen
Consultant, former Math and Science Advisor
U.S. Department of Education

Larry Rosenstock
Principal and CEO
High Tech High, San Diego

Barbara Schulz
Consultant, Science Education Partnership
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