Education Challenges in the 21st Century

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Intel Corporation

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What We Make Possible

Improving people's lives through innovative technology

Inspiring tomorrow's innovators

Enriching communities through citizenship

Designing products & facilities with the environment in mind

Leading Environmental Sustainability

- Responsibly managing our operations
- Designing EcoSmart products
- Leading collaborative initiatives

Intel is the Single-Largest Corporate Purchaser of Green Power in the United States – Over 1.3B kilowatt hours/year

Advancing Education Worldwide

- Investing in education programs
- Advancing technology access
- Supporting strategic alliances and advocacy
- *Intel Teach: More than 6 million teachers trained in over 40 countries*
- *$100 Million annual investment to improve education*

Inspiring the next generation of innovators

$120 Million investment to engage and reward interest and achievement in math and science

Modeling Corporate Citizenship

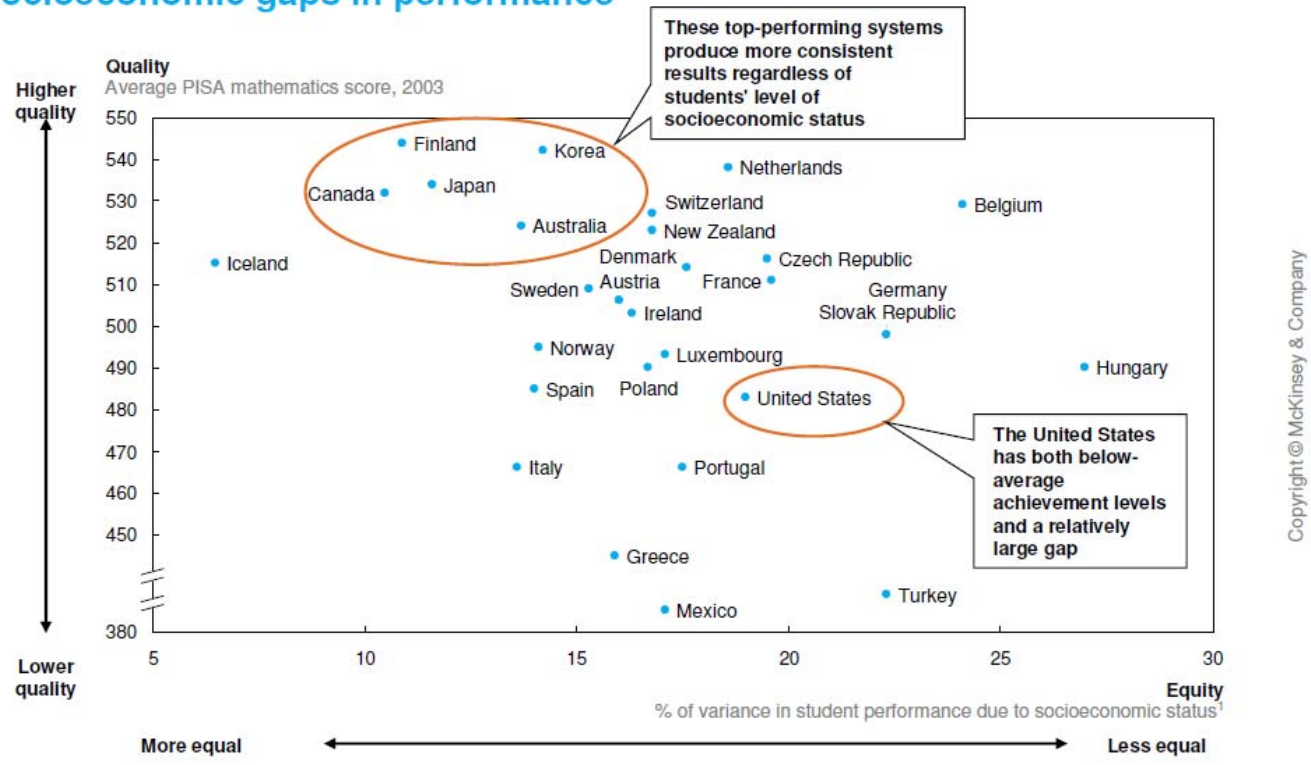
- Building a foundation of business ethics & compliance
- Innovating in our communities
- Demonstrating global leadership in corporate responsibility

1.3 Million Hours of Volunteer Service in Our Communities in 2008

Challenges in the 21st Century

- US has both has both a below average achievement and a large socioeconomic gap
  - Part of achievement gap is due to shortage of qualified math/science teachers in high poverty, rural and minority areas
- Teachers shortages will exacerbate as baby boom generation retires and as states adopt additional math/science courses for high school graduation
- Not enough students pursue STEM education and careers...
  - And girls and minorities are under-represented

In general, top-performing educational systems have smaller socioeconomic gaps in performance



1 Socioeconomic status as measured by PISA's index of economic, social, and cultural status.

SOURCE: Learning for Tomorrow's World – First Results from PISA 2003; McKinsey analysis

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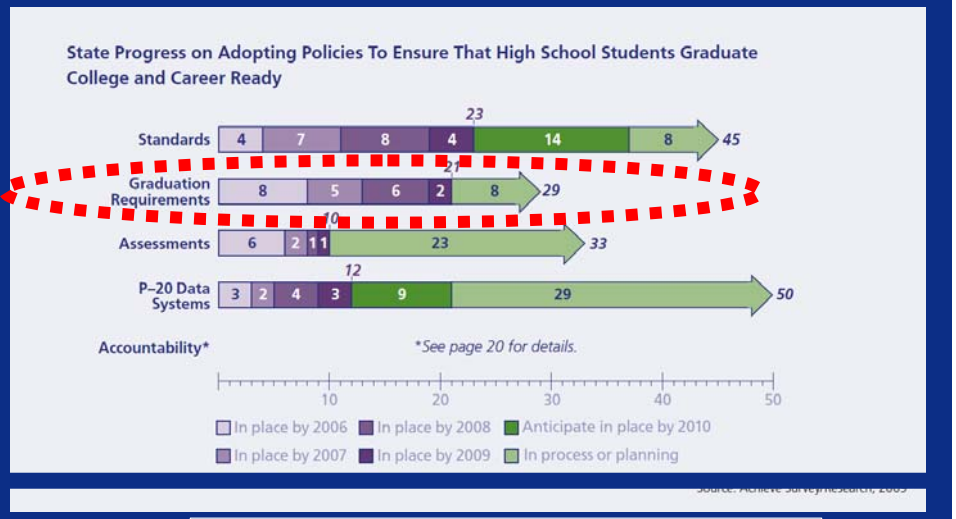
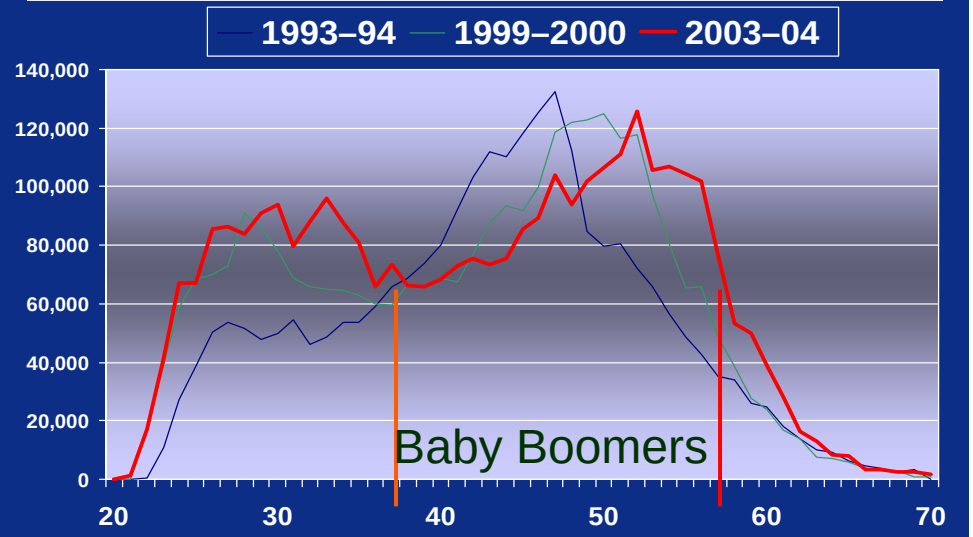
US has a large socioeconomic performance gap

Demand for teachers Up, Supply is dwindling

- Demand for math and science teachers is increasing
  - States are increasing the number of math and science classes needed to graduate from high school

- 1.7M “Baby Boomers” teachers are expected to retire in the next 10 years



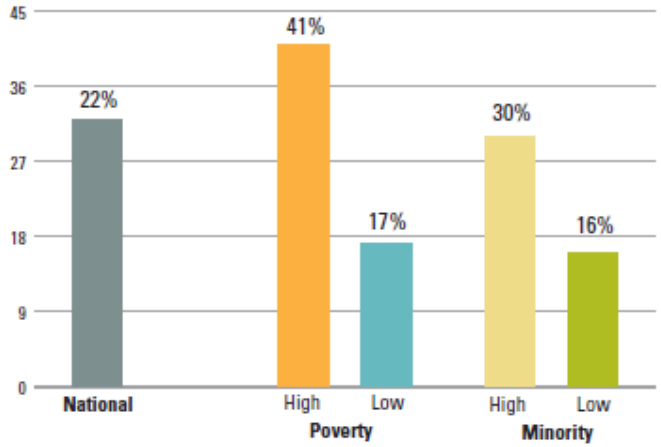


Math and Science teacher shortages are accelerating

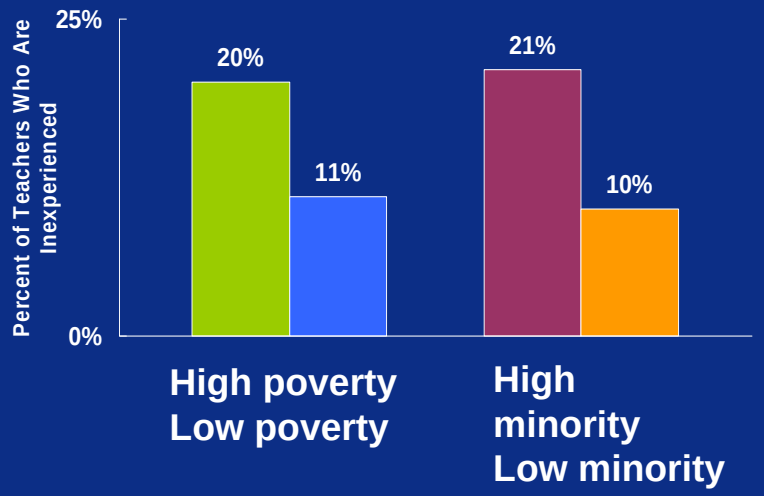
Poor and Minority Students have a great number of Inexperienced* and Out of Field Teachers

Nationwide, secondary school mathematics classes are taught far too often by out-of-field teachers. For students in high-poverty and high-minority schools, access to highly qualified teachers remains even more elusive.

Percentage of Classes Taught by Teachers With Neither Certification Nor Major



Source: Analysis of 2003-04 Schools and Staffing Survey data by Richard M. Ingersoll, University of Pennsylvania, 2007.



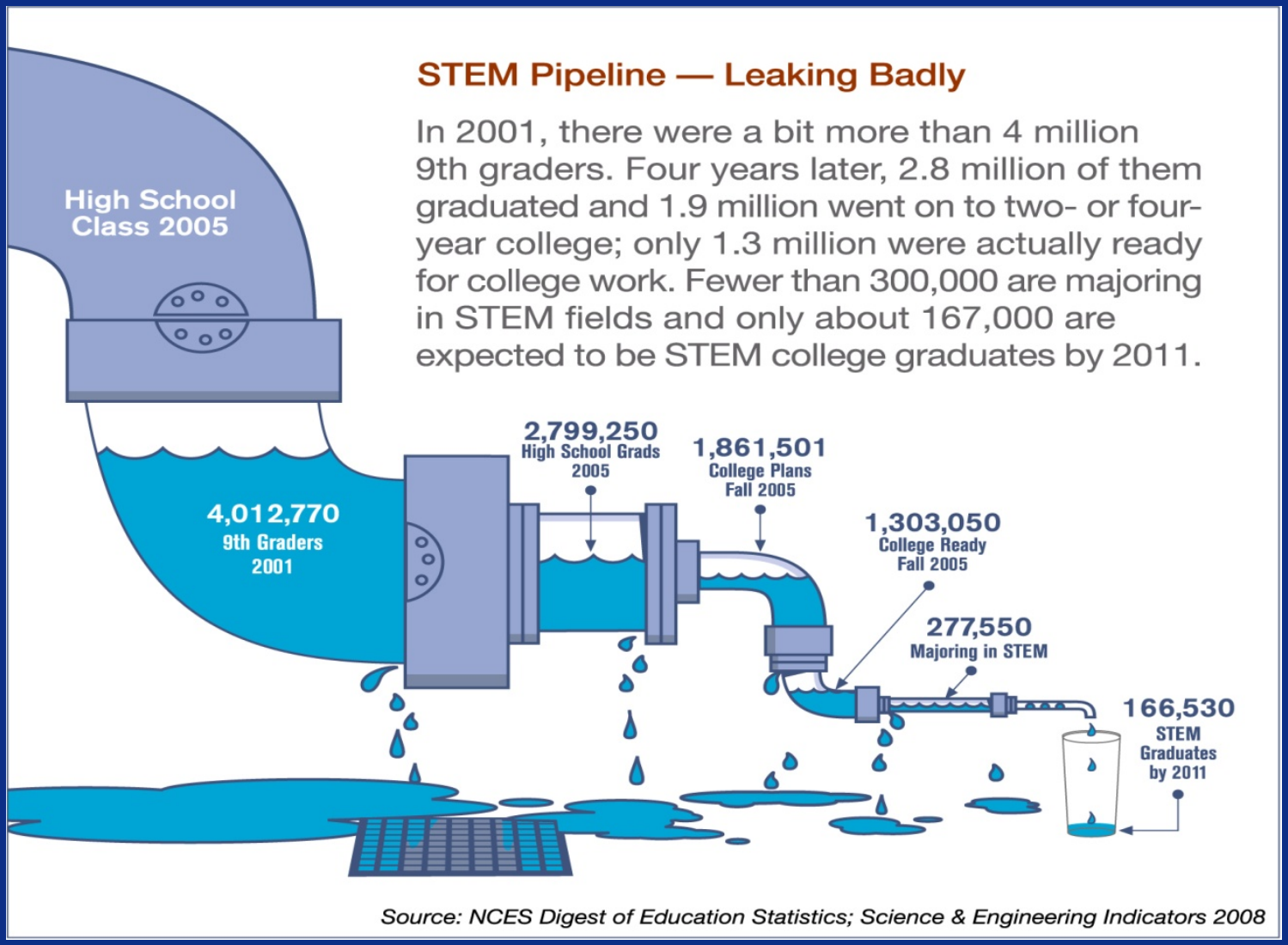
High Poverty and High Minority Areas have higher % of Inexperienced Teachers

***Teachers with 3 or fewer years of experience.**

Note: High poverty refers to the top quartile of schools with students eligible for free/reduced price lunch. Low poverty-bottom quartile of schools with students eligible for free/reduced price lunch. High minority-top quartile; those schools with the highest concentrations of minority students. Low minority-bottom quartile of schools with the lowest concentrations of minority students

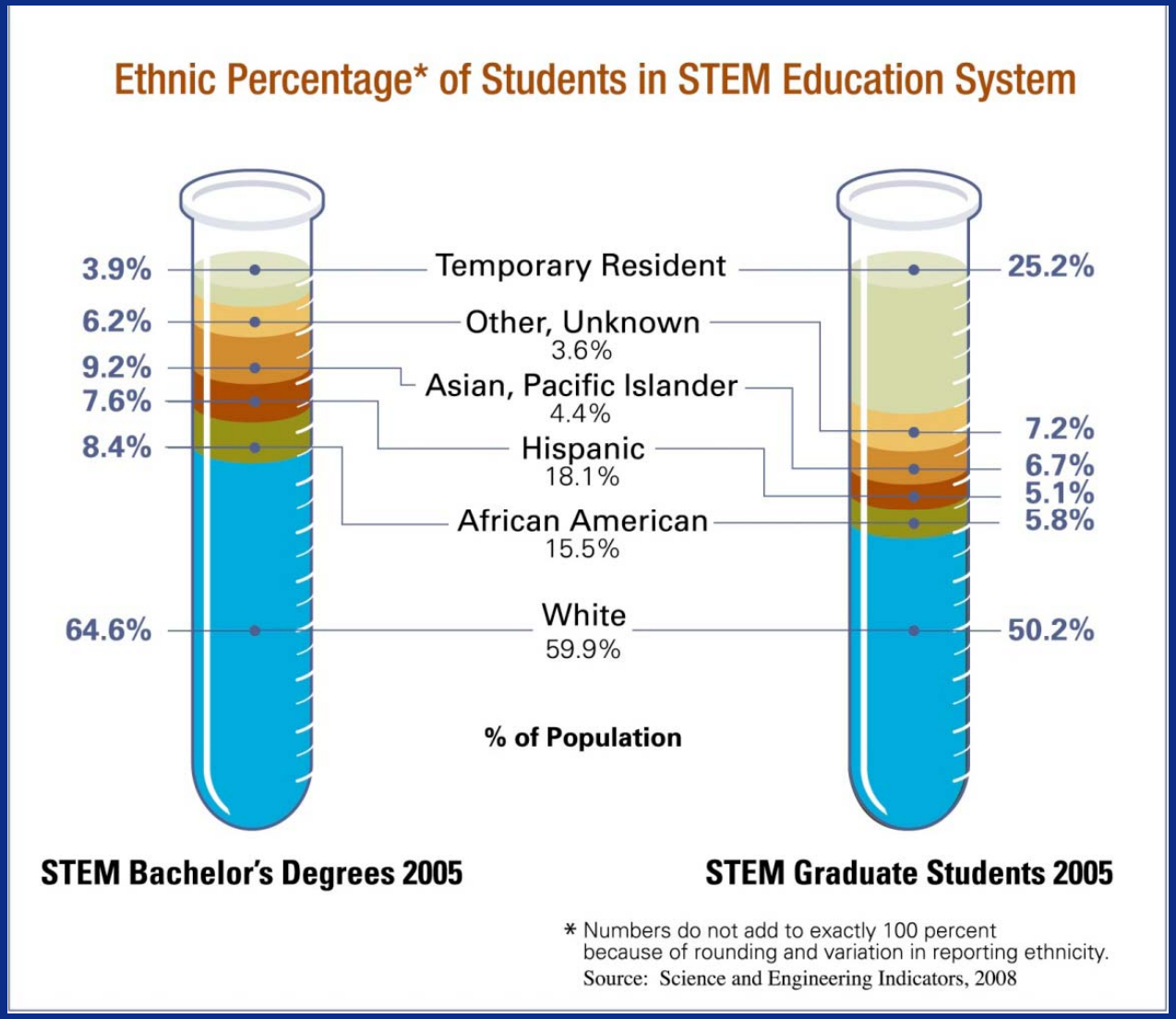
Source: National Center for Education Statistics, “Monitoring Quality: An Indicators Report,” December 2000.

THE PROBLEM: *A LEAKY PIPELINE*



Bill and Melinda Gates STEM strategy slide

THE PROBLEM: *BEING SHUT OUT OF STEM CAREERS*



Bill and Melinda Gates STEM strategy slide

Positive Vectors, Powerful Partners

Education and STEM Education are priorities for the President and the Secretary of Education

Research is informing our thinking and planning

- Changing the Conversation-NAE/NSF (http://books.nap.edu/openbook.php?record_id=12187&page=1)
- Hart-Duke Engineering (http://summit-grand-challenges.pratt.duke.edu/national-survey)
- Deloitte Manufacturing Institute (http://www.deloitte.com/dtt/cda/doc/content/us_mfg_manufacturingviewpoint060809.pdf)

State Leadership gets the importance of STEM education

- NGA Innovation Initiative (http://www.nga.org/Files/pdf/0702INNOVATIONStem.pdf)
- NGA CCSSO Achieve International Benchmarking (http://www.ccsso.org/whats_new/press_releases/13359.cfm)
- Common Core Standards

More focus on STEM –old and new players on the field

- Gates, Carnegie, Broad,
- Corporation for Public Broadcasting
- Business Higher Ed Forum

Science and innovation is a priority..

President Obama

"Science is more essential for our prosperity, our security, our health, our environment, and our quality of life than it has ever been before"

"We know that the quality of math and science teachers is the most influential single factor in determining whether a student will succeed or fail in these subjects"

$12B commitment to Community colleges

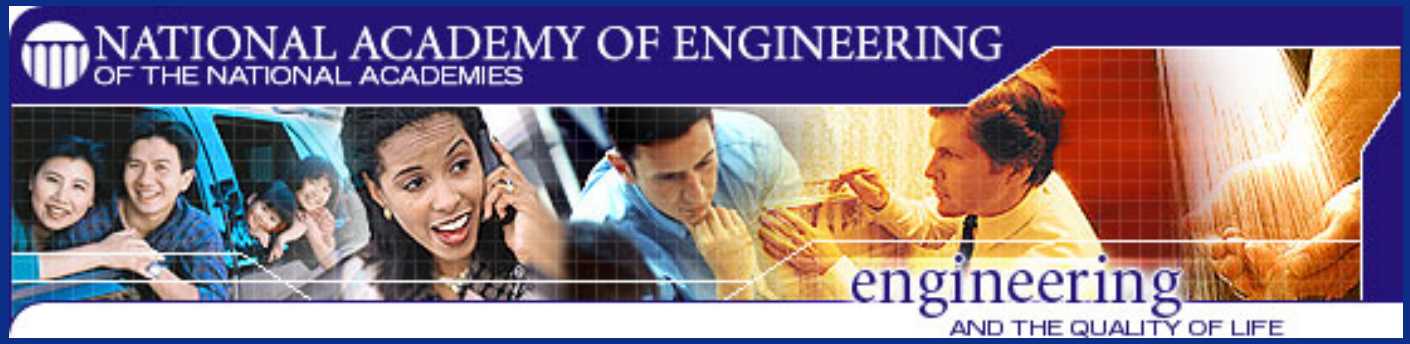
Secretary Duncan

"Science education is central to our broader effort to restore American leadership in education worldwide"

Studies show that interest in science is strong in high school but it drops dramatically at the college level. We need to change that. We need more people in engineering. We need them for the healthcare and the green energy industries. We need them in technology.

Changing the Conversation: Messages for Improving Public Understanding of Engineering

June 2008



Committee on Public Understanding of Engineering Messages. 2008. Changing the Conversation: Messages for Improving Public Understanding of Engineering. National Academy of Engineering. Washington, D.C.: National Academies Press.

~ Engineers… are creative problem solvers ~

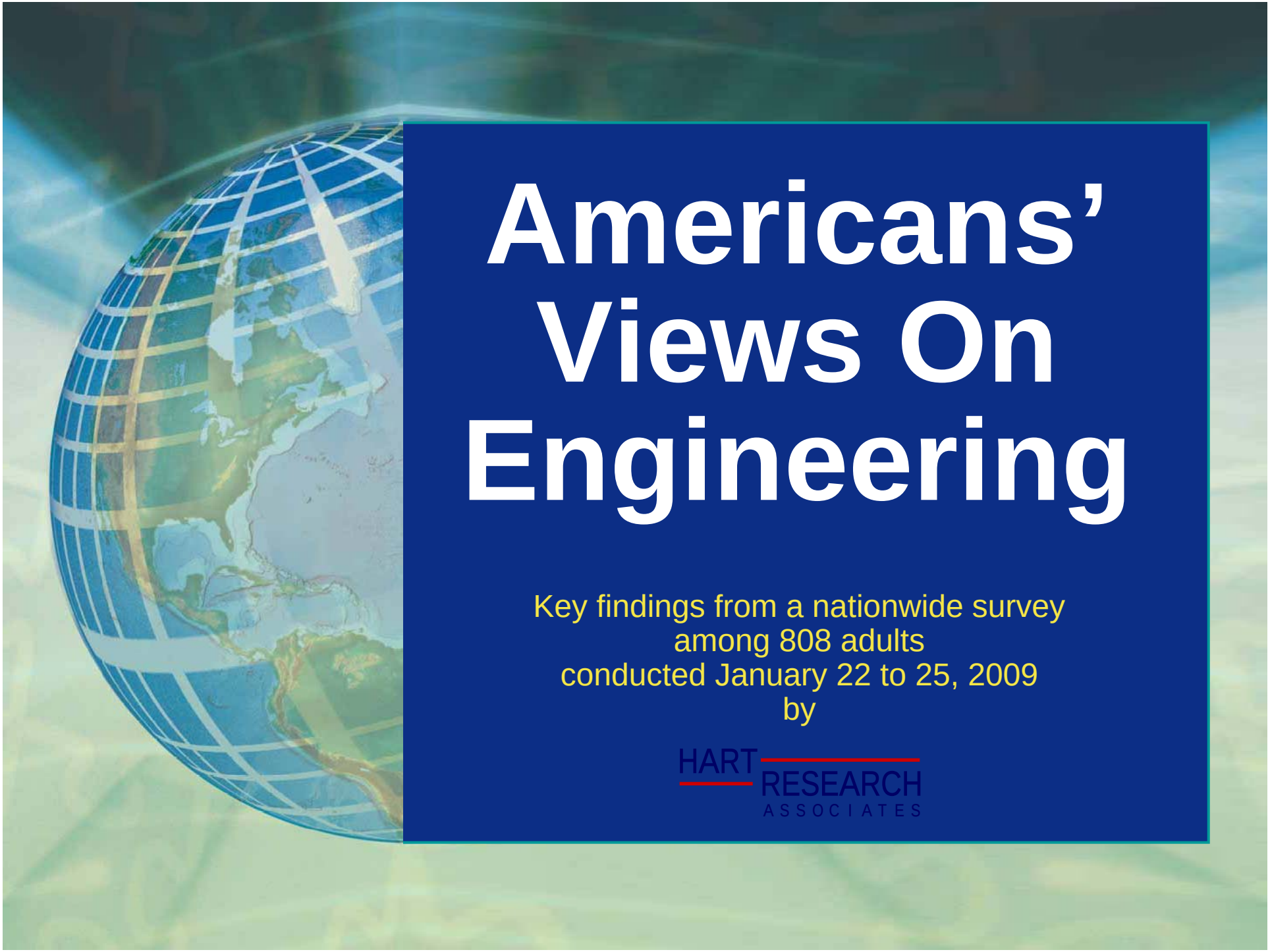
The Problem

- Lots of time and effort invested to promote engineering ($400M per year, 2002 NAE report)
- Prestige of profession (periodic Harris polls)
- Views of engineers and scientists
- Data show adults and teens do not know what engineers do
- Women, African Americans, Hispanics and Native Americans vastly underrepresented in the field

~ Engineers… make a world of difference ~

In a Nutshell…

- Recast communications from personal benefits and skills needed to how engineers make a difference in the world
- Start talking in terms of ideas and impact
- Not a world of challenging math and science… but a world of difference
- Position engineering experience as one of discovery, design, imagination, innovation and contribution



Americans' Views On Engineering

Key findings from a nationwide survey
among 808 adults
conducted January 22 to 25, 2009
by

HART RESEARCH ASSOCIATES

Perceptions of opportunity and education put engineering at a disadvantage.

Volunteered Reasons Engineering Is Losing to Medicine, Business, and Law*

Net Opportunity	32%	Net Education	27%
Not high paying, more money in other fields	20%	Hard, difficult, too much schooling	16%
Lack of opportunity, more jobs in other fields	10%	Education reasons, lack of math, science	15%
Not enough publicity, not promoted	10%	Emphasis on health care, medicine over engineering	12%
Not as glamorous/ prestigious as other professions	9%		

*Among adults who say engineering is losing to other professions

http://summit-grand-challenges.pratt.duke.edu/files/grandchallenges/Hart_survey_engineering.pdf

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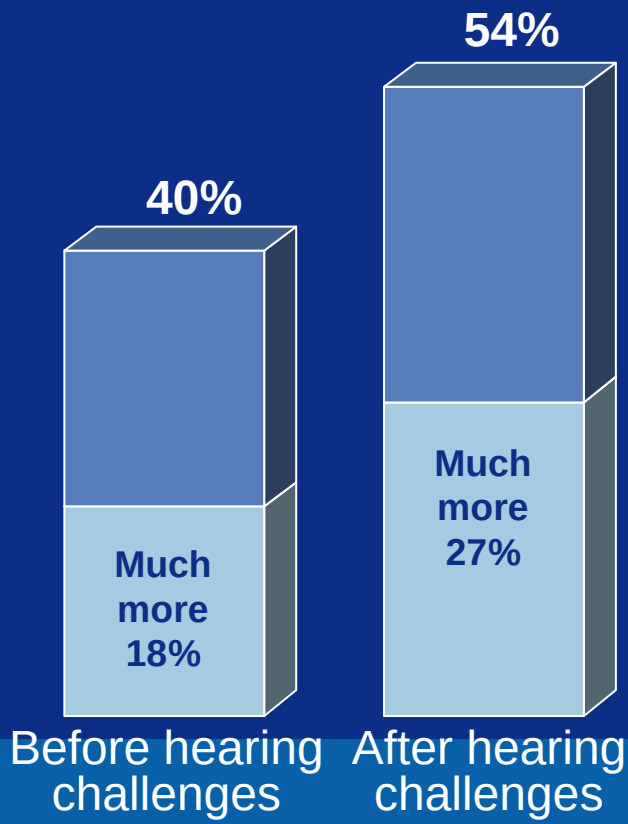
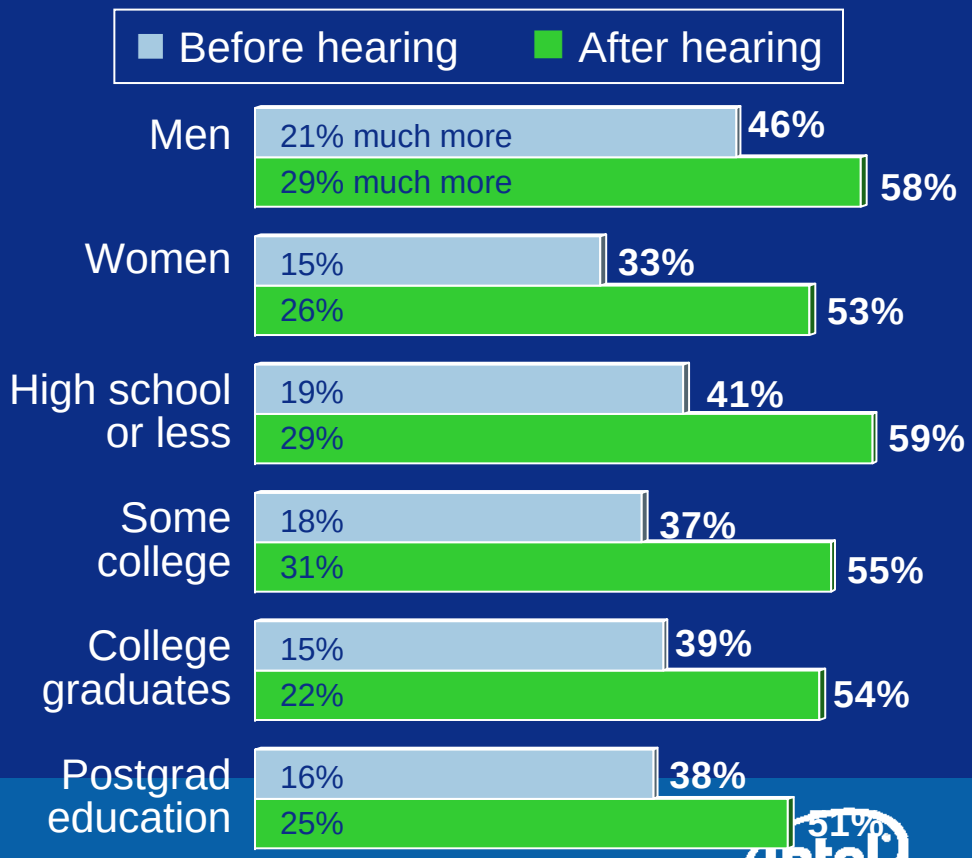
Learning about NAE challenges enhances perceptions of importance and interest in engineering.

% saying engineering issues/problems are more interesting/ important than those of medicine, business, and law





Public viewpoint on manufacturing-June 2009

2009 Study commissioned by Deloitte and the Manufacturing Institute

- **Out of 7 Key Industries, Manufacturing is Viewed as Our Most Important to Maintain a Strong National Economy**
- **Americans Want to See a Strong US Manufacturing Base—71% agree**
- **Americans Also Strongly Believe that Manufacturing is Important to Our Standard of Living—81%**
- **And Americans Believe Manufacturing is Important to Our Economic Prosperity 82%….. *However, youngest Americans are least likely to think that manufacturing is important to our economic prosperity-71%***

http://www.deloitte.com/dtt/cda/doc/content/us_mfg_manufacturingviewpoint060809.pdf

Positive Vectors: State and National Initiatives

- NGA Innovate America Initiative and International Benchmarking
- Achieve American Diploma Project; 36 states, K-Higher Ed + Biz
- Common Core Standards NGA/CCSSO coalition
- Unprecedented $100B investment by the federal government in K-12 education
  - Funding targets high need schools $3.0B (includes PD)
  - Scale and expand programs that close achievement gap: $4.6B (Raise to the top fund)
  - What works in innovation fund: $750M
  - K-12 Funding and control is still local – 92% of total funds are local/state and states are facing large deficits
- Gates Foundation STEM investment
- College Readiness, Equity and STEM
- Business Higher ED Forum-STEM Modeling Tool

What is the Common Core State Standards Initiative?

The Common Core State Standards Initiative is a significant and historic opportunity for states to collectively develop and adopt a core set of academic standards in mathematics and English language arts

•This initiative will allow equal access to an excellent education for all students

•49 states and territories have signed on to the Common Core State Standards Initiative led by the NGA Center and CCSSO

- This initiative will potentially affect 43.5 million students which is about 87% of the student population
  Source: SchoolDataDirect.org; 2007)

•The standards will be based on research and evidence from leading national organizations and high-performing states and countries

•The standards will reflect what a student needs to be successful in college and in the workplace

- College and Career Ready July ’09; Grade by Grade January ‘10

Bringing Engineering to Life

•NSF: initiative to bring science and engineering to life—production of a series of 5-8 minutes video profiles of scientists and engineers, with the objective of presenting an exciting but balanced picture of various scientific and engineering disciplines.

- Aimed primarily at high school students, the series is designed to be a tool to help students gain a better understanding of scientific and engineering career fields and to inspire students to consider pursuing careers in science and engineering.
- Seeking new engineers to profile by September 4, 2009

http://www.nsf.gov/news/speicai_reports/profiles/

•Engineer Your Life: a guide to engineering for HS girls but…..http://www.engineeryourlife.org/

•Imagine IT2: a modular film project inspiring kids to use their imagination to solve the world's grand challenges http://www.imagineitproject.com/video/index.htm

The Grand Challenges as portals to illuminate engineers making a difference and changing the world

Critical role of Community Colleges:

1) Walk the talk:

- **Preparation for college and career are the same at the core**
  - **Preparation for the broadest range of choices**
- **From skills needed and personal benefits to how STEM professionals make a difference**

2) Align with Strategic Elements of College Ready and Post-Secondary Success

- College Readiness
- Equity
- Teaching Effectiveness
- Economic Competitiveness

3) **Increase completion rates**

- Making remediation work even better, and sharing what you know

4) **Bring great teachers to all students**

- Role in teacher preparation especially math classes
- Dual and concurrent enrollment for students
- On-line learning

Funders Interests

- Common Core BKMs--Research, review and adopt things that work
- Build Value add and innovation on top of the BKMs
- Collaborate to achieve economies of scale, disseminate and expansion
- Demonstrate impact; leading indicators of success acceptable

Together We Can

Questions

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