When business collaborates with academia to enhance STEM education, we serve our students well. Needs are identified; skills and experiences are transferred efficiently and effectively.

—John Veihmeyer, Chairman and CEO, KPMG U.S.

Given the rapid speed of change in today’s global marketplace, a country must invest in its greatest asset—its people—and train them to excel in science, technology, engineering, and math.

—John Chambers, Chairman and CEO, Cisco

In a world where countries are competing like companies, the best educated and most talented workforce is a critical factor for success.

—Andrew N. Liveris, President, Chairman and CEO, The Dow Chemical Company

Science, technology, engineering and math are the foundation of innovation in this era of global competitiveness. Without STEM talent, the U.S. risks mediocrity, which would have unfortunate implications for our economy, industries and national security.

—Bill Swanson, Chairman and CEO, Raytheon Company

By getting today’s students passionate about careers in science, technology, engineering and mathematics, we create the pipeline of talent necessary to develop the leading technologies that will continue to be the backbone of our economy as well as our security and quality of life.

—Jim Heppelmann, President and CEO, PTC

Future job growth will be in STEM disciplines, and a nation aspiring to be a global leader can use STEM education as a perfect platform for economic growth and prosperity.

—N. Chandrasekaran, CEO and Managing Director, Tata Consultancy Services
STEM EDUCATION MULTIPLIES IMPACT ON THE WORLD

With access to technology and the right skills, the next killer app could come from San Antonio or Shanghai. It could come from Peru or the Palestinian Territories.

Today, the “right skills” often require a foundation in science, technology, engineering, or math (STEM). But not enough young people are studying these subjects to fill the global demand.

When more students pursue and become passionate about STEM subjects — and all they make possible — we will begin to multiply our impact on people, communities, and the planet.

Cisco is proud to support organizations that prepare and inspire students to pursue STEM careers, whether in kindergarten or college.

You + networks = impact

Innovation for tomorrow begins with leadership today

At KPMG LLP we recognize that STEM education plays a critical role in enabling the U.S. to remain the economic and technological leader of the global marketplace of the 21st century.

KPMG proudly congratulates the 100 CEO Leaders in STEM for their leadership and extraordinary contributions to science, technology, engineering, and math education. There are no limits to where insights and innovation can take you.

kpmg.com
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About the Publishers

EDIE FRASER
Chief Executive Officer
STEMconnector®

LORENA S. FIMBRES
Director, Corporate Development/Marketing and Communications
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As CEO, Edie is leading STEMconnector® – with a team that brings collaboration in STEM education, presents information and results to STEM and offers more than 16 major products and best practices.

STEMconnector®’s research and publications include: Where are the STEM Students? Where are the STEM Jobs, the amazing 100 CEO Leaders in STEM; the 100 Women Leaders in STEM and EdTech: Revolution in Education.

Edie has published 10 major reports/publications and has written three books including Do Your Giving While You’re Living, co-authored by Robyn Spizman and Risk to Riches: Women and Entrepreneurship in America. She was publisher of CEOs Who Get It; Diversity in America; the CEO Magazine, The Diversity Primer and The Diversity Officer. Edie is proud to have worked with more than 250 Fortune companies on their women and diversity leadership.

Edie is also a Senior Consultant to Diversified Search. Prior to joining Diversified, Edie was Founder and CEO of Diversity Best Practices (DBP), a member service for diversity practitioners where she designed the CEO Diversity Leadership program, including the prestigious CEO Diversity Awards. Edie is also the founder of the Business Women’s Network (BWN). Edie has won more than 43 awards for her commitments to women, diversity and philanthropy. She serves on several major boards. She is the first woman Chairman of the World Affairs Council of DC. She has been inducted into the Enterprising Women Hall of Fame and a Founding member of C200. Edie received the Lifetime Achievement award from Diversity Woman Magazine and its Mosaic Award. Edie was on the cover or Women of Wealth Magazine for her philanthropy and mentoring.

Lorena currently serves as Director of Corporate Development/Communications and Marketing for STEMconnector®. In this capacity, she is responsible for brand development and communications strategy. At the same time, she works to develop and serve a portfolio of STEMconnector® sponsors and partners.

Fimbres is the executive publisher of the 100 CEO Leaders in STEM and the 100 Women Leaders in STEM, which aim to recognize top leaders across industries that are making a difference in the development of STEM education and STEM jobs pipeline. Lorena’s publications include The American Institute of Architects’ Small Business Resource Guide: Contacts to Contracts and the 2011 Women’s Business Leadership Tribute, which profiled 50 top executives from Corporate America.

Prior to moving to the United States in 2010, Lorena held several positions of increasing responsibility within the Government of the State of Sonora, including the Executive Office of the Governor. Lorena has a passion for politics and her political experience includes campaign management and political marketing. She served as a senior member with the executive team that oversaw 101 parallel campaigns at the local and state levels.

Lorena holds a Bachelor Degree in Business Administration from the internationally recognized Tecnológico de Monterrey. A native of Sonora, Mexico, Lorena resides in Washington, DC with her husband Francisco.
We were collectively blown away, humbled and inspired in reviewing the words from many of the most renowned CEO’s on the world.

These 100 CEO Leaders are significant advocates of Science, Technology, Engineering, Math (STEM) skills and education to drive our countries prosperity and competitiveness in this new economy. They empower us and give us the ammunition to do more to build our STEM education pipeline and workforce. We at STEMconnector® are proud to share these compelling insights and reflections of 100 CEO Leaders in STEM! There is thought-provoking language in each and every profile that makes you want to devour the content, to read, reflect, take notes and motivate others in the STEM community to stop and study these leadership mandates. Mandates from our most esteemed CEO’s and companies are enclosed such as: KPMG, Microsoft, CISCO, Dow Chemical, DuPont, Walmart and more.

This publication is not for those comfortable with status-quo as we have no time for status-quo when it comes to educating and building a skilled workforce that can compete for the jobs of today and tomorrow. Our CEO’s show us we cannot afford to lose our competitive edge. We are all challenged to move from ideas to action as the next step as the 100 leaders illuminate real concerns of the skills mismatch, need for strategic partnerships and refinement of over-arching goals and metrics. With clarity of focus there can be a renewal of action to drive change. We at STEMconnector® urge corporate America and our greater small business community to read carefully and share these CEO interviews. Understand well the common themes, needs and concerns and urge all institutions to review and internalize the key messages. We salute our 100 CEO leaders in STEM and their initiative to step up for our future. We look forward to more and more CEO leaders in STEM.

The statements are passionate; the themes are universal, no matter what industry. We learn from the CEOs that we must tackle building STEM capabilities as critical to: competition, global talent, technology, education and we need advocacy every step along the way. All STEM related skills are needed to compete for jobs and especially critical for women and our diverse populations who are currently under represented. STEM education will only advance through awareness, strategic partnerships, scale and deep commitment.

Thank you!

STEMconnector® thanks all the CEOs who contributed to this amazing product. We salute you deeply for your commitment and passion. We thank our sponsors and partners who championed our work: KPMG (our first sponsor), Cisco, Dow Chemical, PTC, Raytheon, Tata Consultancy Services and University of Phoenix. We would like to thank as well our partners: US News and World Report, Business-Higher Education Forum, Manufacturing Institute and Fortune. A deep appreciation for all corporate teams who worked with us day and night to make this happen.

Highlights

Most of the CEOs interviewed expressed their views on consistent themes you will read in the material in this significant publication.

Key themes emerged in:

- Technology
- Innovation
- Skills to STEM Careers
- Support for STEM Education
- Public-Private Partnerships
- Women, Girls and Diversity
- Leadership Commitment and Advocacy
- Branding STEM as FUN! Career Option
- Scale and Outcomes Based Metrics

They highlight that it requires committed leadership to win the STEM education battle and remain a competitive nation.

John Chambers, Cisco Systems, Inc, emphasizes, “Education is the area in which we have the greatest opportunity to lead... A skilled workforce is the backbone of a successful and competitive economy.” Chambers points out the struggle and need to drive success. “(We) need an assessment of what works and a shared model for success.” Al Grasso, The Mitre Corporation, comments that we have to “expand the pool of talented people who can deliver the innovation and technical prowess that will maintain our nation’s competitiveness.” He discusses, as do the other CEOs, the need for partnerships and the critical need to focus on diversity and women for STEM fields.

Dave Cote, Honeywell, comments, “Now is the time to utilize our resources to share our passion for innovation and technology...Our future workforce is reliant on our nation’s ability to train and educate..."
Dow looks for solutions to some of our nation’s most important challenges. We believe that one of those challenges is to prepare the next generation of scientists, engineers, chemists and innovators for careers in science, technology, engineering and mathematics (STEM) fields. Across the nation, our support takes shape in programs like You Be The Chemist®, from the Chemical Educational Foundation® (CEF). We are proud to collaborate with organizations like CEF to do the important work of changing lives through quality education.
MISSION:
ENGINEER YOUR EDUCATION

From thrill rides powered by mathematics to museum exhibits that make math and science come alive, Raytheon is showing young students how to engineer an amazing future. After all, anything’s possible when MathMovesU®.
future scientists and engineers,” Tom King, National Grid US, contends “Our next step is to inspire everybody—from families, to students, to small business owners, to big corporations—to do their part.” King adds, “If you build it they will come. It’s about being pro-active—understanding what you need and working as a team to make it happen.”

Our Future Success with STEM Careers Starts with Committed Leadership

There is agreement from our CEO’s that STEM careers will determine the success of our nation. The 100 CEO Leaders in STEM start with their commitment, and it is universal. Pierre Gauthier, Alstom U.S. and Canada, confirms that we need both innovation and CEO advocacy. “We simply cannot preserve America’s role as an epicenter of innovation, create new jobs and make our country more competitive on the global market without doubling-down on efforts to train a more STEM-oriented workforce.” He adds that CEO’s have as much of a vested interest in becoming advocates of STEM as they do with their laser focus on the bottom line. Wick Moorman, Norfolk Southern Corporation emphasizes, “Everyone with backgrounds in the STEM disciplines can be, and should be, a corporate leader. A STEM-aware CEO will simply set the stage for those people to succeed. And then he will get out of the way.”

The CEOs feel strongly as Jim Rogers, Duke Energy, shares, that to stay ahead on global innovation, “First, we must embrace the work other countries are doing- and even partner with them… The second thing we need to do is work harder to retain human capital … to keep these brilliant minds in the U.S.”

Support STEM through Building Strong Talent and Technology

Bill Swanson, Raytheon, shares “Science, technology, engineering and math are the foundation of innovation in this era of global competitiveness. Without STEM talent, the U.S. risks mediocrity, which would have unfortunate implications for our economy, industries and national security.”

As Jeff Immelt, General Electric contends, “For any company or country to stay competitive, they need two things: talent and technology. The foundation for both is a real investment and commitment to STEM education.” He points out clearly “That (STEM education) must begin with a revamped and rigorous K-12 curriculum and continue with skill development and training for both those about to enter the workforce and those already at work.” Most other CEOs are in agreement with statements such as Richard Fairbank, Capital One Financial Corporation, when he shares, “The impact of STEM is on display every day as we watch industries being disrupted by digital business, the use of data and analytics, and new technologies… STEM will be the backbone for future innovation and economic growth.”

Steve Ballmer, Microsoft, talks about competition and the urgent need for computer science graduates, “STEM jobs are among the fastest growing and highest paying occupational groups. Looking at where the global marketplace is right now and where we are headed, the imperative is simple: If we do not improve access and attainment in STEM, the U.S. will continue to fall behind other nations.”

Marillyn Hewson, Lockheed Martin Corporation is in alignment and states “Our future success—and our nation’s technological advantage—depend on a constant supply of highly trained, highly capable technical talent.” She continues, “We need to show them (students) how rewarding a STEM career can be.”

Michael Duke, Wal-Mart Stores, ties together the need for STEM education and workforce development by saying, “More and more jobs today require technical training- across all industries and fields… If we do not encourage young people to major in STEM fields, we simply will not have the talent pool to meet the demand.” Stephen Roell, Johnson Controls, references their partnerships with two Wisconsin universities to mine and recruit talent: “To advance our products and services in the years to come, the company will need the talents of a dedicated and highly trained workforce.”

Workplace Skills Transferable to Jobs in Our New Economy

Michael Lamach, Ingersoll Rand, adds “The future of any nation is dependent on having the right mix of work place skills that are transferable and a steady supply of jobs.” He talks about ramping up communications to encourage young people to pursue STEM Careers and expresses concern over the diminishing talent pool as the Baby Boomers retire over the next 10 to 15 years.

Randall Stephenson, AT&T, Inc., advances, “Developing STEM skills in young people will be increas-
Voices from 100 CEO Leaders in STEM

Accordingly important to this country’s ability to innovate and compete.” He references the mismatch seen by other CEOs as well of the demand for skilled workers and the available supply. Indra Nooyi, PepsiCo, offers that “There’s a tremendous opportunity to attract young talent toward a career in STEM field” and that they must get an understanding of what kinds of jobs are there. She says as well “The private sector needs to do a better job of communicating the huge array of jobs that require a STEM education and skills.” Robert Moritz, PwC US, focuses on skills as well and tying students to skills as critical to our economy. He points out that according to PwC’s 16th annual Global CEO Survey “more than half of the U.S. CEOs point to the lack of availability of key skills as a potential threat to growth in 2013.” Moritz challenges businesses, educators and communities as an economic imperative to “help introduce STEM-related courses to students at an early age, and with greater frequency.”

Dan Akerson, General Motors, contends, “GM can only progress if we continue to feed a pipeline of innovative, tech-savvy, globally focused young thinkers to our product development teams. There has never been a more important time for leaders in STEM fields to develop the next generation of talent.” Pete Sellig, Michelin North America, Inc., comments that failure to concentrate on STEM talent will force companies to look overseas for workers. What we appreciate at STEMconnector® is what he verbalizes so well, “We need to be able to articulate what careers in these fields look like today and become personally involved in education. From college and technical students all the way down to those in high school and middle school, they need to understand what a STEM career path might offer.” Ed Casey, Serco Inc., advances, “Over the past 10 years, growth in STEM jobs has significantly outpaced the growth of non-STEM jobs, and it is clear the trend is likely to continue.” He cites that the U.S. Department of Labor projections show the fastest growing occupations in America require STEM preparation.

The Need to Make STEM Cool!

Ajay Banga, MasterCard, comments “STEM education is one of our lifelines to the future.” He says that we must make learning fun and advance STEM skills with an entrepreneurial spirit. “The solution requires active partnership between public and private sector organizations dedicated to STEM education like STEMconnector®.” Speaking about fun, we turn to Dr. James Truchard, National Instruments, who shares about his passion, “We have to engage students with fun, hands-on experiences with real-world engineering tools because we need the future generation of scientists and engineers to solve the world’s engineering grand challenges.” He adds the need to empower educators with tools and interactive classrooms, anything to engage and capture students’ interest and talents.

Jim Heppelmann, PTC, shares that our nation is based on innovation and entrepreneurship. We must inspire students in STEM to be competitive and make education “cool again.” Heppelmann adds the need for apprenticeships and mentorships to assure pipeline success. He concludes that if successful with STEM jobs, we can be on the top of the list of global innovators.

Al Bunshaft, Dassault Systèmes Americas, shares “The key to attracting and motivating more students into STEM careers is one simple word: inspiration.” He adds, “Most standards today are too focused on academic requirements and metrics.”

Need for Innovation, Technology, CEO Advocacy and Investment in Human Capital

Bill Swanson, Raytheon Company, states that “STEM education is critically important to the U.S. and we need to have a strong education pipeline and workforce so our nation can continue to be a leader in innovation.” George Paz, Express Scripts, shares that as a healthcare technology company built on an innovation culture, “We significantly invest time and money to ensure that science, technology, engineering and mathematics are not only core competencies of our current employee population, but that the future leaders of our company are also well skilled in these important areas of study.”

John Veihmeyer, KPMG U.S., shares other leaders concern for change through technology to be successful. He says, “As the economy evolves relentlessly toward digitization, machine intelligence and analytics, STEM education and workforce development are critical to our nation’s continuing competitiveness.”

Sajjan Pillai, UST Global, poignantly states, “In this era of increasing global competition, with the advent hyper connectivity and a flatter world, human capital specifically in STEM will become the single biggest as-

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We want America to lead in the 21st century. Nothing is more important than a continued focus on STEM. As global industry leaders, our job is to get students passionate about STEM.

Skills for today. Technology for tomorrow. Success for the future.

We are honored to be included with other visionaries who are working together to help students better understand and pursue the wide variety of career opportunities in science, technology, engineering and math.

Today’s young adults are tomorrow’s innovators and entrepreneurs. Let’s give them every advantage.
Navigating a world of new rules and new opportunities. There is a certain way.

TCS is proud to be a leader in creating a sustainable STEM talent and job pipeline; and we salute our CEO, N. Chandrasekaran, and all the 100 CEO Leaders in STEM.

In a fast-evolving marketplace which demands leadership that brings results, there exists a way of certainty: Tata Consultancy Services (TCS). With TCS as your strategic advisor and partner, the ever-changing new landscapes of business become new vistas of opportunity, from digitally connected consumers to big data to emerging markets to end-to-end solutions for transforming your organization. TCS offers you market-proven, world-class experience, expertise and guidance to show the way for your business to evolve. Visit tcs.com/retail and you’re certain to learn more.
set of a nation. Without STEM talent, our nation would slip further in innovation which would be significantly detrimental to the economic development of our nation in spite of our natural resources.”

**The Strong Tie Between STEM Education in Our Schools, Internships and Job Growth**

As Doug Oberhelman, Caterpillar, shares that there is a “proven correlation between STEM jobs and GDP growth,” Oberhelman references the National Governor’s Report that highlights “STEM occupations are among the highest paying, fastest growing and most influential in driving economic growth and innovation.” Tom Linebarger, Cummins, adds “Industry must take a stronger stake in education by taking part in developing schools’ curriculum, creating internships for talented students and supporting communities with valuable education opportunities and resources... Education is the single most important factor in achieving U.S. innovative competitiveness globally.”

Peter J. Davoren, Turner Construction Company, shares his vision on the impact and power of giving students an opportunity to experiment the real world: “Our internship program is more than a summer job — it’s a professional and educational process that prepares students for a successful transition to a challenging and rewarding career.”

**Innovation, Dreamers and STEM Success are Tied**

Nathan Myhrvold, Intellectual Ventures, ties technology and innovation. He comments “Technological progress moves us forward as seen throughout history. We see it today in the functionality of our smartphones. Technology moves quickly and we must be ready with people who understand and have the knowledge to keep pace.” Henry Stine, Stine Seed Company, suggests, “Where there is a strong focus on STEM, there is a focus on innovation.” He adds that it requires great STEM education accessible to all students, at all levels.”

Mark Zuckerberg, Facebook, urges the importance of knowledge and ideas to solve big problems. “In the last century, the economy was mostly driven by natural resources and manual labor. The economy of the future will be driven by knowledge and ideas. Science, technology, engineering and math are going to be really important for everyone in this future... I also think technology gives us this amazing chance to solve fundamental problems that we’re facing as a society and affect people’s lives every day.”

Muhtar Kent, The Coca-Cola Company, calls for more dreamers and doers! “I would contend that most of the human advancement we’re witnessing today is the byproduct of dreamers and doers in the areas of science and technology who are never content with the status quo... I call them the ‘constructively discontent’.”

**Use Innovation to Fuel Growth or We Won’t Be Successful as a Nation! Tie to Inspirational Education and Employees**

Ellen Kullman, DuPont, talks about “The backbone of America’s economy is innovation and at the heart of innovation is science. From astronauts to social media, from Kevlar® to the NFL- STEM careers are everywhere,” Richard Kramer, Goodyear Tire & Rubber Company, contends that all companies are looking for their competitive advantage. “Innovation is the biggest thing that will set us apart... Innovation enables us to evolve, to be creative, to grow, to adapt.” Innovation tied to skilled workers is the clarion call as we review these powerful interview testimonials of 100 CEO Leaders in STEM.

Michael Araten, K’NEX Brands, comments, “STEM is the heart of Innovation. Innovation drives growth, profits & the roles of the future.” He further states that we can’t let jobs go unfilled because we don’t have the required skills.

Joe Echevarria, Deloitte, emphasizes the need for worker retraining adding “STEM graduates are our country’s fuel for economic growth and critical to innovation, and, as a nation we face a shortage of 230,000 STEM workers by 2018.” Alex Gorsky, Johnson & Johnson, shares that to be at the top of global innovation there is a distinct tie from classroom to world solutions: “… the story is not merely about examining molecules and isolating viruses... The narrative we need to lay out is a much larger one. It speaks to solving global health problems that loom large before us – problems that do not respect geopolitical borders or disparities in age.”

Inge Thulin, 3M, concurs, “3M has a keen awareness of the importance of fostering the next generation of innovators... We recognize the importance of STEM disciplines in solving some of the world’s most pressing problems.” Robert Parkinson, Baxter International, adds, “Innovation is such an important part of our national fabric that, over the past 250 years, it has
made America what it is today... Education is the most important issue in our society.” Michael Long, Arrow Electronics, agrees, “We need to create a generation of STEM-literate innovators...” He further states, “When the traditional lines between business, education and art are blurred mega-innovation-happens.”

Booz Allen, Ralph Shrader, confirms, “The STEM disciplines hold the key to unlocking innovative solutions to our most pressing challenges.” George Barrett, Cardinal Health, starts with the family, “Our children need our support and encouragement every step of the way, helping them to reach their potential and achieve their dreams. It also takes highly skilled, dedicated and inspirational teachers of STEM subjects to continually encourage and motivate our children.” Leo Daly III, LEO A DALY, adds the 'A' for Architecture (Art and Design as well). He says, “When it comes to promoting STEM education, we acknowledge our bias for architecture and engineering.” He adds that they bring creativity and innovation to each STEM task.

Gerry Smith, Lenovo, lays out the challenge given the low U.S. rating by the World Economic Forums’ latest Global Competitiveness Report. Smith observes, “The competitiveness starts with a strong STEM education system, with teachers and professors who can foster this talent and encourage student to pursue STEM careers.... This country is dependent on a combination of strong talent, training, and passion that is required for our STEM professionals to succeed.”

Technology and Innovation is THE Theme Song of the CEOs

Wendell Weeks, Corning, is clear when he says, “Technology innovation is the biggest differentiator... We need sustained investment in Research, Development and Engineering.” Francisco D’Souza, Cognizant, speaks to the importance of a skilled, knowledge-based workforce “The future of work is being transformed by powerful forces: globalization, virtualization, disruptive technologies and the emergence of millennial employees and customers...our world is increasingly dependent on technology.” The tie to the next generation of Technology and STEM coupled with strong innovation will be essential. Natarajan Chandrasekaran, Tata Consultancy Services, asserts “As we become more “digital” as a society, not only does STEM education lead to technology-led innovations, but also increased competitiveness and productivity of a country.” He adds “One of the guiding principles that I have adopted both professionally and in personal life to advance STEM education is ‘Realize One’s Potential’.”

Many of the CEOs review why we need computer science teachers in our schools, as it is simply where the jobs are. The CEOs focus on jobs and careers especially in the technology space. Though we don’t have enough computer science teachers. Eric Schmidt, Google, Inc., shares, “Put simply, technology breakthroughs can’t happen without the scientists and engineers to make them. The challenge that society faces is to equip enough people, with the right skills and mindset, and get them to work on the most important problems.” (BBC)

Technology Tied to Careers and Jobs
Brian Roberts, Comcast Corporation, points out that if it’s not a natural resource, most likely it was innovated or built by an engineer. “It’s not enough to be users of technology. We need people in the country who understand how things work and have the creativity to dream up new things that we can’t even imagine.” Michael Ward, CSX, ties it all together with “The workforce of tomorrow is the school today.” He adds the importance of defense capabilities where “the nation must have leading STEM knowledge.” Lowell McAdam, Verizon, shares, “The demand is there. The real issue for Verizon and the country as a whole is on the supply side of the equation. Corporations need to develop and implement a concerted strategy for finding intellectual capital and investing in the education of our young people so that we have a pipeline of capable workers to fill these knowledge-based jobs.” This theme is universal with the CEOs.

Jorge Benitez, Accenture North America, confirms the talent thrust stating “We believe the demand for STEM talent – in high tech companies as well as numerous other industries—will explode in the net decade.” Phil Blake, Bayer USA, ties it together in saying that “A strong science education today means a strong citizenry and workforce for American tomorrow... To remain competitive, the U.S., its STEM industries and communities must have access to a vibrant pool of diverse STEM workers who are well-trained, highly skilled and who bring different ideas and perspective to the table.” Scott McGregor, Broadcom Corporation, shares that we must re-dedicate efforts to create a trained and incentivized STEM workforce. “Unlike any other nation in the world, the United States’ systems of governance, education
and business historically rewards innovation – this is our greatest advantage as a competitor in a global economy.” Anthony Orlando, Covanta, makes an intriguing point, “Americans who have an interest in pursuing a STEM career typically gravitate towards computer science and not to the traditional science and engineering fields necessary to support power generation and infrastructure development.”

CH2M HILL Lee McIntire, asserts, “Our work doesn’t stop once students have entered the STEM pipeline. We must also support programs that keep students engaged through graduation and into the workforce.” According to Hugh Grant, Monsanto, “It’s our job to show young people that a rewarding STEM career is within reach.” Greg Brown, Motorola Solutions, reflects on cultivating employee knowledge and capabilities, “The STEM disciplines are changing rapidly. Leaders have to advance STEM education to create a pipeline they can use to continually renew their companies with current and fresh ideas.”

Tie to Health, Economy, and National Security

Several CEOs emphasize the tie. Robert Bradway, Amgen, shares that “despite the great progress we have made in the past century in the field of medicine, millions continue to suffer from grievous illnesses around the world. That is why we at Amgen take our investments in science education so seriously and encourage others to join this important effort.”

Freescale, Gregg Lowe, reminds us “Virtually every aspect of our lives can be made safer and more productive through the benefits of modern electronics… We must entice more students to study in the STEM fields that will drive tomorrow’s economy.”

Linda Hudson, BAE Systems, shares “When I was young, the race to put a man on the moon inspired and attracted an entire generation of engineers to aerospace and defense. Today, many of those STEM-minded students would much rather work at Google or Facebook…. We need to do a better job attracting students not just to STEM, but to our industry. Our national security depends on it.”

ROI as Business Responsibility

Most of the CEOs provide examples of what their companies have funded and what the results are, giving not only cash as capital but also human capital. They focus on ROI and results of what they fund. Rich Templeton, Texas Instruments, asserts, “We must move from being great philanthropists to being strategic investors who are looking for return on investment—with the ROI in this case being student achievement.” He further postures that solutions take more than money. “It takes investment and involvement.” Templeton drives that business cannot act alone. Rather a collaborative effort is required for systemic change. D. Scott Davis, UPS, is right at target when linking community investments with talent and business: “We view investing in the development of future employees, customers and global citizens as the right thing and the smart thing to do.”

The Need for Partnerships

Everyone must build partnerships between the private and public sector, non-profits and communities. Klaus Kleinfeld, Alcoa, shares why partnerships are critical, “We are woefully behind. The only way to change the situation is through public-private partnerships: Industry identifies the needed skills, schools provide the training and the public sector creates a supportive environment through policy and funding.’’

ExxonMobil, Rex Tillerson, sees that even in a company of problem solvers, “no one organization or company can address the issue alone. It requires a collective effort, and we are proud to play our part by partnering with leaders in the field and advancing programs that make a difference.”

Alan Mulally, Ford Motor Company, after discussing innovation and careers and the need for STEM Global Talent, contends, “The most important thing is that we work together in partnership with leaders in education, government and business.” Jeff Wadsworth, Battelle, agrees about partnerships: “Our greatest successes in STEM are the result of public-private partnerships.” Eric Spiegel, Siemens Corporation, asserts, “Public-private partnerships are an essential component to creating a successful education-to-employment system because they allow for the marriage of supply and demand.” Steve Bennett, Symantec, observes, “The key to STEM investments is to seek partnerships with programs that have demonstrated measurable results.” Then he further comments to invest in sustainable programs and guarantee proper funding for STEM initiatives. “Together we can turn the tide.” It takes collaboration from education to workforce. Dennis Albaugh, Albaugh, contends, “It is important that public and private entities collaborate to help our children achieve success as the next generation workforce.”
Michael Gregoire, CA Technologies, shares that “We need to make tech cool” and need to start early with kids for STEM careers. Cargill, Greg Page, states that “developing partnerships with organizations that build and improve STEM programs allows Cargill to help educate the next generation of American scientists and engineers.”

David Zaslav, Discovery Communications, shares “Public-private partnerships are essential to ensuring that our country is producing the skilled workforce we need in the future.” Sam Allen, Deere & Company, contends as so many other CEOs do that “private-public partnerships can enable the biggest, most sustainable results.” Andrew Liveris, The Dow Chemical Company, weighs in on how essential partnerships are as he shares, “Corporations like Dow, which depend on a robust talent pipeline of skilled workers, have a responsibility to invest their resources and expertise in improving STEM education in the United States.” He says that the challenge is too large for any stakeholder and that we must come together and develop a “golden triangle of partnership” to achieve high quality education to fill the talent pipeline. Clay Jones, Rockwell Collins, highlights the partnership necessity and says, “One approach cannot solve the STEM education challenge alone…that’s why partnerships between public and private entities are important.”

**Driving Toward Measurable Results – What Is Working**

John Lechleiter, Eli Lilly and Company, not only cites technology and innovation but collective efforts, partnerships and with that results. He says, “The main thing is to ensure that the collaborations are relentlessly focused on driving measurable results, and that they align resources and advocacy efforts behind what is working.” Anita Zucker, The Intertech Group, comments that smart STEM investments matter. She says, “STEM investments should have a specific purpose with a focus on a long term, exponential impact. As we invest in STEM education initiatives, we increase visibility which building a workforce and a cache of future educators.”

Richard J. Kramer, Freeport-McMoRan, shares his focus, “The programs we support are designed or selected for their ability to increase student interest, improve teaching ability and confidence in subject matter, and improve student achievement and outcomes in STEM disciplines. Our goal is to inspire students to pursue post-secondary degrees or trade and technical certifications – and ultimately careers – in mining and other STEM related industries.”

**It takes Creation of Excitement for Teachers and Students and Message of Hot Careers**

Marc Casper, Thermo Fisher Scientific, contends, “We need leaders, starting with teachers in primary schools, who can create and sustain excitement for STEM subject and celebrate successes…and if we can drive energy and excitement through teachers...we can turn STEM careers into the hottest careers within the decade.” Dr. Wanda Austin, The Aerospace Corporation, ties it all together as she discusses the majority of jobs will require a computer savvy workforce. She remarks, “The first step is to strengthen the talent base of our teachers in K-12... We also need to get the word out on the fabulous STEM careers for young people and how math and science lay a foundation for those careers. We don’t want them to opt out unknowingly.”

Mark Bertolini, Aetna, is convincing as he says: “I am more passionate about technology because technological advancements are driving discovery in all of the STEM disciplines.” Carlos Rodriguez, ADR, shares a great passion: “I am personally very passionate about education as a path to advancement.”

**Support of Diversity and Women is Universal and Global with Our CEO’s**

Ilene Gordon, Chairman, Ingredion Inc., makes the point that close to two-thirds of the women CEOs of FORTUNE 500 companies have STEM degrees. “Fielding a more balanced gender workforce—not to mention a more ethnically diverse one—will positively change the game.” As Thomas Voss, Ameren, shares, “our company has several programs in support of STEM education and many of my colleagues are very devoted to advancing its importance, particularly for women and minorities.”

Mark DeYoung, ATK, unites STEM and Diversity support as they are “naturally connected.” So many other CEOs have selected both diversity and women/girls as high priority. Dr. Chris Nelson, Kemin Industries, is clear, “I believe much of our future success will hinge on doubling of the number of students interested in STEM-related areas of study and that means a focused effort on programs to engage girls and women.”
Dawne Hickton, RTI International Metals, Inc., states “I am passionate about finding ways to increase the number of women and minorities in the field.” With this she shares, “Committing early to STEM education in the STEM fields will build robust pipelines of future STEM employees.” Ilene Rosenfeld, Mondelez International, Inc., discusses how innovation is critical to compete but also focuses on the critical area of diversity. She says, “I’m passionate about making our workforce more diverse.” She also focuses on showing girls how STEM can be fun and that this needs to be prioritized. Mary Vermeer Andringa, Vermeer Corporation, discusses that STEM jobs are growing three times faster than other jobs over the decade, that we must support workforce development especially for women, and that building collaboration is essential. She shares, “If we continue to build on these collaborative efforts, both in-state and across state lines...we will achieve success.”

Ann Drake, DSC Logistics, shared a company initiative to increase women’s leadership in the logistics and supply chain industry: “The initiative recognizes the contribution of women leaders to the field and promotes the development of up-and-coming leaders. The initiative is named AWESOME - Advancing Women’s Excellence in Supply Chain Operations, Management and Education.”

Stephen Rowe, Jr., Ernst & Young, says that many of the corporate responsibility initiatives aim to strengthen education and build STEM skills. He then shares a strong diversity commitment with “One strong point of connection between our STEM initiatives and our commitment to diversity is our inclusiveness recruiting strategy.”

Steve Swad, Rosetta Stone, talks about that the need is for global orientation as “there is a high probability that many of our STEM students will experience working on international projects...,” Languages will be needed as well as the thinking “to think locally as well as globally.” This is a critical part of diversity as we collaborate with innovators across the world. The view of community engagement, both U.S. and global, is key as shared by many of the CEOs such as Duke Energy and The Coca-Cola Company.

**It Takes CEO Commitment!**

The submissions include a message of commitment shared in all the CEO interviews. As we conclude this introduction, we note that change can’t occur without it. Dr. Paul Jacobs, Qualcomm Incorporated, states it well, “We need corporate leaders to make the commitment to advancing STEM education.... Our leaders must invest resources and time to provide mentorship and guidance.” These CEO commitments are voiced throughout each submission.

Denise Ramos, ITT, postures that “Leaders also support STEM when they are successful change agents within their own organizations.”

Mort Zuckerman, U.S. News & World Report, sums up, “We know what the need is. We know what the benefits are. We’ve got to find some way to push this issue in the forefront of awareness of the American public.” The rationale is clear from the CEO perspectives. Wes Bush, Northrop Grumman Corporation, has summarized that we must change. “STEM-based expertise is at the heart of our high-technology culture, society and economy;” Yet, the number of young students falls short. We must change given the competitive world and need for diverse STEM talent. Yes, it takes commitment and resources and the engagement toward move the needle. Our nation’s future depends on it.
STEMconnector® is the leading communications platform connecting stakeholders in STEM education and workforce development. Partners include corporations, industry associations, professional societies, think tanks, state and local governments, Federal Agencies and students and educators concerned with STEM education in the United States.

Offering a suite of products whose aim is to identify, inform and connect entities working in STEM Education/Careers STEMconnector® is a primary hub connecting employers to the educational sector in STEM. The ultimate goal of these efforts is to encourage strategic and high-impact investments that improve educational outcomes in the labor force.

STEMconnector® enables and nurtures connectivity among the diverse efforts to build the STEM workforce of today and tomorrow with a particular focus on increasing participation by women and underrepresented minorities. Our work spans the entire pipeline (Kindergarten — Jobs) and how STEM Education experiences translate into careers. Our products and services include the following:

**STEMconnector.org**

With more than 5000 STEM stakeholder profiles, the STEMconnector® database maps the STEM Education activity of organizations and state-level. Organizational profiles are under major categories: business, government, associations, diversity and women and education. Major subject areas are available and cross-referenced. Research is intensive as the profiles are updated and the site includes a searchable database. The STEMconnector® database has given the STEM community a giant resource and a tool to establish partnerships with a broad cross section of organizations working in STEM education to increase connectivity in regions through working relationships. The site is a growing resource with subject areas added and updated regularly. STEMdaily®, STEM Results, STEM publications and a STEMconnector® Blog and social media are key features.

**STEMdaily®**

STEMdaily® provides hot relevant news to a broad audience of stakeholders involved in STEM Education. The electronic daily news provides summaries of 20 stories across 14 different categories with links to the original content in an easy-to-read format. STEMdaily® includes a variety of sources: major news outlets, business wires, blogs and affiliate submissions. As of May 2013, the STEMdaily® reaches over 8000 individuals. After being released, all stories are archived in a searchable database available for research and reference. Sign up at www.STEMconnector.org/STEMdaily Submit a story to STEMdaily@STEMconnector.org

**EdTech weekly report**

STEMconnector’s EdTech Weekly Report is the one-stop source for everything happening in the EdTech and Digital & Distance Learning space. Curating stories from a variety of sources, EdTech Weekly ReportTM focuses on the macro-trends in the policy, technology development, and media spheres that is making EdTech the change issue for education. Additionally, STEMconnector® will track and offer events, competitions, and STEM BriefsTM that will put it at the nexus of the changing face of education in the United States and in the world.

**TownHALL Conference Call**

The objective of these calls is to convene thought leaders, key voices from across the stakeholder community to present perspectives from industry, government, education and non-profits working on these issues. The TownHALL conference calls bring together high-level decision-makers within organizations across the public, private, academic and non-profit sectors with the aim of informing and connecting stakeholders by establishing common goals and patterns of excellence. Town Halls have been held on STEM Jobs, Workforce Planning, Diversity and Women and Girls.

**STEMconnector’s Innovation Task Force: Leaders driving change** - Innovation is the intersection of invention and insight, leading to the creation of economic value. STEMconnector’s **STEM Innovation Task Force** will select pockets of innovation within the STEM education ecosystem — compelling priorities — for analysis, mapping, and promoting general understanding of the relationships between STEM talent development, STEM job creation and workforce career paths in STEM.
STEM Food & Ag Council

The Food and Ag Council will leverage the collective intellect, wisdom and resources of food and agriculture business, education and policy leaders to identify clear action plans that connect and create careers in food and agriculture. Members of the Council will share their goals to collaborate on focused initiatives that drive impact—both in the United States and throughout the world. Industry leaders from food and agriculture will collaborate with leaders from government and education. This unique framework will support critical insights that will drive systemic innovation. Informal and formal education channels will be included and support from major agricultural stakeholders like Community Colleges, Land Grant Universities, National 4-H Council, FFA Organization and other agricultural education leaders. In addition to leadership in their institutions, participants of the Council will share a passion for educating the next generation food and agricultural workforce. Industry organizations such as Institute of Food Technologists (IFT) and International Food Information Council (IFIC) will also be essential this Council.

Available in hard copies and electronic versions, STEM publications seek to provide tools and resources to recognize and spread the message around the importance of STEM. Initially thought to be used to promote STEM role models, this project of STEMconnector® include 100 Women Leaders in STEM, 100 CEO Leaders in STEM; EdTech: The Revolution in Education; Where are the Students? What are their Career Interests? Where are the STEM Jobs?

100 Leaders in STEM Series. At STEMconnector® we believe it is important to celebrate and showcase those leaders making a significant contribution to STEM education and careers. This series brings together a collection of leaders taking an active role as ambassadors for STEM. The goal of this series is to build a collective voice calling for a strong STEM leadership.

Results Matter! The STEM Results™ Project applies best practices, measurement and data results to more than 5,000 organizations involved in STEM Education. STEM Results™’ challenge is to inventory, document, and make available matching STEM organizational goals, targets, and achievements and comparing them to measurable results. Focus is on data and impact with intent that programs with results can be scaled up and shared. STEMconnector®/ASTRA — with the support of Cisco—seeks to share best practices information with the STEM community. STEM Results™ documents who is providing the best analysis of results on their STEM programs. STEMconnector®/ASTRA will recognize and honor those STEM organizations that are accomplishing specific, measurable, achievable, realistic and time-bound (SMART) results.

STEM Council™ is a formalized intra-company or organizational structure. The purpose of the STEM Council is to lay the foundation for companies to establish internal structures to develop holistic STEM Education/Workforce strategies. The Council offers a framework for strategic planning with a coordinated STEM approach and leveraging of resources as well as best practices, and impact on STEM investment. All corporations and organizations are encouraged to form STEM Councils and share with STEMconnector® as we seek best practices, sharing of mission, plans, execution and success of integration for ROI on STEM.

Million Women Mentors MWM is a collaboration of STEMconnector®, National Girls Collaborative Project (NGCP), MentorNet and NPower that leverages the strong network each brings to the STEM community. MWM will take a coordinated and collaborative approach that embraces hundreds of partners organizations to increase the number of women engaged as mentors, make pathways to mentoring more accessible. Our goal is to connect one million mentors with ten million girls.

For more information visit www.STEMconnector.org
The drive to innovate is a hallmark of 21st century global companies. As a result of this changing pace of innovation, companies and regions exploited the virtuous cycle, beginning with basic and applied research funded by government and corporations and leading to new products, services, and jobs. This innovation premium reflects the increasing complexity of the problems and challenges that businesses are required to solve today and the pace at which these solutions must be brought to market. The demand for innovation is not limited to new products. Successful companies must innovate throughout the organization—in R & D, in product design and engineering, in supply chain and manufacturing, and in finance and marketing.

But an essential, often undervalued ingredient is a highly educated and skilled workforce, because innovation in turn requires increased emphasis on learning organizations where employees are lifelong learners. Workers must not only possess exceptional technical skills, but also the so-called soft skills, the 21st century workplace competencies, and also must be able to develop new skills while maintaining existing ones.

Unfortunately, we find that relatively few students are adequately prepared for college and the workplace, and even fewer high school and college graduates are interested in high-demand fields that fuel the innovation economy.

Although innovation hot spots (i.e., Research Triangle, Silicon Valley, Boston’s Route 128 Corridor) have excelled at refining the interactions among government, universities, and companies to advance science, technology, engineering, and math (STEM) learning to fuel innovation, the U.S. as a nation has been far less effective in remedying the misalignment between education and the workforce, particularly in emerging STEM fields such as data science and analytics, cybersecurity, energy, water and materials sciences, and engineering. In fact, McKinsey’s report, Big Data: The Next Frontier for Innovation, indicates that due to exploding demand for talent with data science and analytics training, global demand for data analytics workers will outstrip supply by 200,000 jobs, with the U.S. experiencing among the largest shortfall, in turn jeopardizing innovation in U.S. companies.

Corporate investment in education at all levels is critical, and we applaud the spectrum of efforts that these noted CEOs have made to elevate the status of STEM education across the country. BHEF members—presidents of America’s leading research colleges

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**About Brian K. Fitzgerald**

Brian K. Fitzgerald serves as BHEF’s chief executive officer, developing long-term strategy for the membership organization. Under Dr. Fitzgerald’s leadership, BHEF’s National Higher Education Workforce Initiative has emerged as the organization’s signature enterprise. Intensive project development through its previous initiatives has enabled BHEF to deploy a model of strategic business engagement in higher education to address the U.S.’ highest demand workforce needs.

In June 2012, BHEF business and academic members collaborated to launch a dozen workforce projects, creating undergraduate programs in emerging, high-demand fields, including data science and analytics, cybersecurity, and energy, water and materials science, and engineering. BHEF plans to launch a second cohort of member-led projects in June 2013.
and universities and CEOs of Fortune 500 companies, many of whom are featured in this publication—took insights years of project development to create an innovative model for business engagement in education shifts away from the traditional transactional model to a strategic business engagement model. This approach uses five corporate levers to improve educational outcomes and workforce alignment:

• C-suite Leadership: Companies’ most senior executives use their direct leadership to (1) shape internal and external messaging to raise community awareness of 21st century workforce demands; (2) build a critical mass of peers focused on undergraduate education in support of workforce goals; and (3) guide corporate policy development to ensure the corporation’s actions align with its education strategic goals.

• Philanthropy: Targeted corporate grants serve as vital catalysts for positive, lasting, and high-impact change in higher education. Examples include support for creating new undergraduate models, virtual course tools that integrate innovative classroom instruction techniques, and operating support as organizations bring new, evidence-based practice to scale.

• Employee Engagement: The hundreds or thousands of employees within an organization represent human capital that can be deployed to support strategic education goals. These individuals, when enabled to act outside the corporation, provide grassroots support for a company’s investments in education and can become major proponents and advocates for the work through outreach, employee advising, and mentoring undergraduates.

• Core Competencies: Businesses use their subject matter expertise to strengthen the education to workforce pipeline by collaborating with higher education. Examples include offering expert support in the creation of new course content aligned to industry standards and partnering with higher education to design new internship models that better equip students with essential skills. As we look to high-demand careers, experts from cybersecurity, water and energy engineering, life sciences, data sciences and analytics, and healthcare will be particularly needed.

Deploying these levers to build robust undergraduate pathways open will enable students making the critical transition between high school and college to continue their education in these emerging STEM disciplines. But as corporate leaders shouldering the responsibility for employing a competitive global workforce, CEOs realize that higher education is the vital link and are collaborating to create curricula and undergraduate degree programs that will ensure America’s graduates will be equipped to enter the workforce prepared to succeed in the competitive global market.

About the Business-Higher Education Forum

BHEF is the nation’s oldest membership organization of Fortune 500 CEOs and research university presidents dedicated to advancing innovative education and workforce solutions and improving U.S. competitiveness. Now in its 35th year, BHEF’s business and academic members collaborate in regions across the country to design and deploy education-workforce solutions in the high-demand and emerging fields that are so critical to innovation and national security. BHEF and its members drive change locally, work to influence public policy at the national and state levels, and inspire other leaders to act. Learn more at www.bhef.com.
Over the past few years, much of the discussion on STEM education has focused on the lack of graduates from STEM fields. The proposed solutions have sought to improve math and science education at primary and secondary schools and increase the number of engineering students in college and graduate school. While these are important and worthy goals, there is another area of STEM education that also requires our attention.

For several years, manufacturers have struggled with a lack of qualified applicants for skilled technician positions. The widespread adoption of automation and computer-aided manufacturing has changed the nature of manufacturing jobs and greatly increased the skills required for these positions. These Applied STEM jobs require a strong understanding of areas like trigonometry, material science, and mechanical systems, and the programming and use of computers to control and operate advanced machinery. Simply stated, Applied STEM jobs are the heart of today’s American manufacturing sector. With the ongoing resurgence in U.S. manufacturing, many more skilled employees are needed.

Manufacturers face two key challenges in expanding the Applied STEM workforce. First, the perception of manufacturing has failed to keep pace with the reality of the technology-enabled shop floor. This lingering image of manufacturing as an undesirable career results in too few people being attracted to jobs in the industry. And second, the qualifications required to obtain a job and pursue a career in Applied STEM have grown as the complexity of manufacturing in the U.S. has increased. The good news is that opportunities and solutions exist to address both of these challenges.

Across the country, individual communities are sponsoring programs that expose students to the world of manufacturing and opportunities in Applied STEM fields. From manufacturing camps at local science centers to welding competitions at area high schools, there are a growing number of programs designed to reach and attract students to manufacturing. Manufacturers themselves are also getting involved. October 4 of this year is the second annual Manufacturing Day. Last year, several hundred manufacturers

About Jennifer M. McNelly

Jennifer McNelly serves as the President of The Manufacturing Institute the non-profit affiliate of the National Association of Manufacturers (NAM). The Manufacturing Institute is the authority on the attraction, qualification, and development of world-class manufacturing talent. As President of the Institute, Jennifer is driving an agenda to research and support manufacturing excellence, innovation and talent, and delivers solutions to make manufacturers in America globally competitive. Jennifer has extensive experience in workforce development, employer engagement, and business. She is a proven leader at the Institute as the chief architect of the NAM-Endorsed Manufacturing Skills Certification System.

In 2012, Jennifer was named one of the inaugural 100 Women Leaders in STEM (Science, Technology, Engineering and Math) published by STEMconnector®. Jennifer is a member of the World Economic Forum’s Global Agenda Council on Advanced Manufacturing; the American National Standards Institute (ANSI) Personnel Certification Accreditation Committee; the Precision Metalforming Association (PMA) Education Foundation; and the Jobs for DC Graduates Board of Directors.
hosted plant tours for teachers, guidance counselors, parents, and students to showcase their operations and demonstrate that today’s manufacturing floor is clean, safe, and high-tech.

Students are not the only opportunity to expand the pipeline for Applied STEM careers. As in the other STEM fields, women are an underrepresented group in Applied STEM careers. Manufacturing in particular struggles to attract women, primarily because of its legacy as a male-dominated industry and the perception that it is still physical labor. Times are changing though and more women can be found in manufacturing. The Manufacturing Institute has a program to recognize the contributions of women and promote more women in science, technology, engineering, and production. Transitioning military personnel serve as another talent pipeline. Veterans have demonstrated an ability to work in teams and perform under pressure and many servicemen and women learned skills in welding, machining, maintenance, and logistics while in uniform.

As more individuals become interested in careers in manufacturing, expanded and improved education programs are needed to provide the qualifications required to obtain a job and begin building a career in the Applied STEM fields. The Manufacturing Institute and the National Association of Manufacturers (NAM) have led this effort, identifying best-in-class industry-based credentials, providing them with an NAM endorsement, and encouraging schools to offer these NAM-Endorsed certifications as a part of their curriculum and companies to hire individuals that possess these NAM-Endorsed certifications.

The Institute is engaged with hundreds of community colleges and technical schools to expand and accelerate their manufacturing offerings with NAM-Endorsed certifications embedded in the courses. Manufacturers themselves are contributing through partnerships with their local educational institution to provide internships, equipment, and expertise. In the last two years, over 170,000 NAM-Endorsed certifications were awarded, demonstrating the expanding use of industry credentials to qualify individuals for Applied STEM careers.

Changing the image of manufacturing, improving the quality of the manufacturing workforce, and expanding STEM and Applied STEM education opportunities requires commitment and leadership from industry. The CEOs included here have demonstrated this leadership and The Manufacturing Institute is proud to support their efforts and honored to recognize them as the 100 CEO Leaders in STEM.

### About The Manufacturing Institute

The Manufacturing Institute is a Washington, DC-based organization dedicated to improving and expanding manufacturing in the United States. We are affiliated with the National Association of Manufacturers and can best be described as part think tank, part solutions center.

In partnership with some of the leading consulting firms in the country, the Institute studies the critical issues facing manufacturing and then applies that research to develop and identify solutions that are implemented by companies, schools, governments, and organizations across the country.

The Institute’s strategies and actions are all done to achieve the following goals: the development of a world-class manufacturing workforce; the growth of individual U.S. manufacturing companies, and the expansion of the manufacturing sector in regional economies.
Building a qualified workforce in the science, technology, engineering and mathematics (STEM) fields is central to American economic competitiveness and growth. Workers in these fields form the foundation of the future global knowledge economy, as STEM-related jobs are expected to grow by nearly 20 percent in the next five years, while the unemployment rate among STEM-degree holders remains about half that of non-STEM workers.

Yet U.S. business leaders warn that the supply of qualified STEM workers fails to meet demand—a situation that jeopardizes our nation’s productivity and our ability to lead innovation in the global economy. The STEM skills deficit affects a surprisingly wide array of industries—including information technology, energy, manufacturing, healthcare, retail, and many others—hindering the prosperity of the nation as a whole.

As the CEOs in this publication suggest, building a sustainable pipeline of STEM-capable workers requires a coordinated approach among industry, higher education and government stakeholders. Employers are certainly an integral part of this coalition, and other partners include parents, K-12 schools, credentialing organizations, professional associations, and many more.

Industry leaders agree that fostering a strong STEM workforce depends on broadening the appeal of STEM careers to a more diverse set of students. Doing so requires attention to several national dynamics:

- Male students are significantly more likely than their female counterparts to show interest in a college major or career in STEM. Although women comprise about 60 percent of college students, they earn only 45 percent of STEM degrees. However, the economic incentive is clear: Women who hold STEM degrees and jobs earn on average 30 percent more than women in non-STEM occupations.
- Blacks and Latinos make up roughly 28 percent of the U.S. population, but represent only 7 percent of U.S. STEM workers. These groups represent a largely untapped human resource to expand the STEM workforce. Engaging and supporting students earlier in their education may lead to successful diversification and expansion of these fields.
- The K-12 education system lacks sufficient, qualified math and science teachers who can bring these subjects to life in a hands-on, engaging way. Teachers from elementary school through postsecondary levels should educate students on the wide range of STEM career options and the importance of STEM for industries and society.

Companies that are successfully cultivating the future STEM workforce are collaborating with school systems and postsecondary institutions to offer mentorships, internships, after-school programs, summer camps, and other creative opportunities for students to experience STEM disciplines outside of the classroom.

University of Phoenix contributes to the development of students in STEM fields and helps them connect their education to rewarding careers. We believe educators can best help in three ways: first, by providing career-relevant educational offerings designed in partnership with industry leaders; second, by creating efficient educational pathways from foundational to advanced skill levels that incorporate a wide range of educational choices for adult learners; and third, by integrating career support services into the educational process to help students map their academic achievements to specific career goals and outcomes.

Addressing today’s workforce challenges requires taking bold, innovative and collaborative action.
Our graduates roll up their sleeves, too.

University of Phoenix graduates have relevant, real-world education. Our curriculum is developed by industry experts and taught by working practitioners. So students learn how business is really done. And that puts both of you ahead of the game.

Let’s get to work.

See how we’re connecting education to careers at phoenix.edu
America’s STEM challenge is not going to get solved without very forceful leadership from the country’s best chief executives. Sorry, you may not have asked for the job, but if you’re a business leader, you’ve got it. Fixing America’s shortage of STEM talent is not just corporate social responsibility, it’s corporate shareholder responsibility. Or, if you run a private company, it’s just smart business.

The men and women recognized in this volume get it. They know the STEM worker shortage is a big and growing problem that threatens American competitiveness, the future of the middle class and the ability of their own organizations to expand. These are people who embrace complex problems, and they’re acknowledged here because they’ve done a lot to help solve this one. They, and others in their companies, have demonstrated leadership on a subject—education—that’s not always easy for business leaders to speak out on. They’ve devoted money and talent to the problem and, in many cases, thousands of man-hours from dedicated fellow employees. They’ve mentored students, staged science contests, created training programs.

Unfortunately, it’s not enough. More needs to be done on the corporate side, in cooperation with state and federal government and the education and nonprofit sectors. And more people need to be made aware of the problem—perhaps most importantly, students and parents. Even as the demand side becomes more vocal, there are still too many people on the supply side who don’t understand the urgency.

The key is to frame STEM as a jobs issue, which is why the companies matter so much. As the country’s employment crisis drags on, government and educators are increasingly willing to listen to employers. The progressive ones are asking, “What do you need to fill your workforce?” The answers are helping to reshape the way we teach, inspire and hire.

At the first STEM Solutions summit hosted by U.S. News & World Report in 2012, Wes Bush, the CEO of Northrop Grumman, stressed the need for companies to be participants and not bystanders. He urged them to reach out and forge creative partnerships with government and education, as his own company has done to fill crucial jobs. He ended his speech with a stark challenge that I think captures the sentiment of the most pragmatic and progressive CEOs:

“Decline, be it national, economic, or corporate, is a choice. It’s not a fate. We all know how intractable the STEM problem may have appeared for these many years, but it does not have to be a permanent affliction. We have options, and we have tools, and we can take action.”

We need more of that kind of thinking. As the executives honored in this volume demonstrate, we have a strong base to build on. I congratulate each of them and look forward to discussing where we go next.

About Brian Kelly

Brian Kelly was named editor of U.S. News & World Report in April 2007, nine years after joining the magazine. With more than 30 years of journalism experience, including covering Capitol Hill, politics, and the presidency both as a beat reporter and as an editor, Kelly is one of the nation’s most experienced magazine editors in steering national and international news content. Additionally he has helped bring U.S. News into the Internet age by integrating the online and print staffs and reinvigorating the magazine’s emphasis on consumer journalism. Kelly is consistently expanding the U.S. News “Best” franchise from its long-time signature products like America’s Best Colleges and America’s Best Graduate Schools to several new data-rich projects that are launching in fall 2007.
The status quo. Linear thinking. These are obstacles to an evolving organization.

At Diversified Search, we offer the power of perspective. By bringing a diverse view to executive searches, we help guide your organization to a better solution.
Inge G. Thulin
Chairman, President and Chief Executive Officer
3M Company

3M captures the spark of new ideas and transforms them into thousands of ingenious products. Our culture of creative collaboration inspires a never-ending stream of powerful technologies that make life better. 3M is the innovation company that never stops inventing. With 330 billion in sales, 3M employs about 88,000 people worldwide, including 8,200 researchers and has operations in more than 70 countries.

3M Community Giving is helping to improve lives in communities around the world. Since 1953, 3M and the 3M Foundation have invested more than $1.2 billion in cash and products in education and charitable organizations. These donations were bolstered by thousands of employee and retiree volunteers. In 2012, 3M awarded more than $56 million to non-profit organizations. For more information, visit www.3Mgiving.com

“Mentoring gives students a connection to someone in the field who can help with career-related questions.”

Inge G. Thulin was named chairman, president and chief executive officer of 3M Company in 2012. A 32-year veteran of 3M, he served as Executive Vice President and Chief Operating Officer of 3M since May of 2011, after having served as Executive Vice President, 3M International Operations since 2003. Mr. Thulin joined 3M Sweden in 1979, working in sales and marketing, and has subsequently assumed levels of greater responsibility.

With hands-on experience building businesses in both developed and developing economies, Mr. Thulin’s grasp of societal trends is impressive. For example, his business background and Nordic upbringing helped shape his view that the global trend toward sustainability presents tremendous opportunities for 3M to both improve the environment, and 3M’s business performance, simultaneously.

Mr. Thulin is known for emphasizing teamwork, a concept he learned to value as a young hockey player in one of Sweden’s top leagues. He is known for his quick wit and accessibility, for focus and clarity, and for his uncanny ability to effectively prioritize.

A native of Malmö, Sweden, Mr. Thulin is an outdoor enthusiast who enjoys skiing, skating and hiking. He and his wife Helene are citizens of the United States, and reside in the Twin Cities.

Mr. Thulin earned degrees in Economics and Marketing from the University of Gothenburg, Sweden, in 1978.

Why do you believe STEM Education and workforce development are critical to our nation’s future?

As a science-based, diversified technology company, 3M has a keen awareness of the importance of nurturing the next generation of innovators. 3M scientists use science and technology everyday to solve problems. More broadly, we recognize the importance of STEM disciplines in solving some of the world’s most pressing problems. As a result, we are committed to developing and supporting programs that inspire and support student achievement in science-related fields.

How does 3M encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

We have found mentoring to be one of the most effective ways to encourage women and students of color to pursue math and science careers. Mentoring gives students a connection to someone in the field who can help with career-related questions.

What is your advice on using private-public partnerships to tackle our most pressing education challenges in STEM?

Collaboration is a key tenet of 3M’s culture of innovation. We encourage scientists and researchers to work together to share technology across the company to develop new customer solutions. We use this same approach in our efforts to support STEM initiatives.

For example, 3M has worked with the St. Paul Public Schools for more than 30 years, providing cash grants, mentoring, skill-based volunteering, including funding a volunteer coordinator at two inner city high schools to connect teachers and students with 3M mentors. We have more than 500 employees and retirees serving as mentors. The company also developed the 3M STEP (Science Training Encouragement Program) for students from St. Paul Public Schools. This program connects high school students with 3M scientists as mentors and also gives the students summer jobs at 3M labs.

Fostering interest in science, technology, engineering and math and developing the innovators of the future is something that we take seriously at 3M and our partnership with public organizations is helping us achieve our goals.
Jorge L. Benitez

Chief Executive—United States and Senior Managing Director—North America

Accenture

Accenture is a global management consulting, technology services and outsourcing company, with 261,000 people serving clients in more than 120 countries. Combining unparalleled experience, comprehensive capabilities across all industries and business functions, and extensive research on the world’s most successful companies, Accenture collaborates with clients to help them become high-performance businesses and governments. Through its Skills to Succeed corporate citizenship focus, Accenture is committed to equipping 500,000 people around the world by 2015 with the skills to get a job or build a business. The company generated net revenues of US$27.9 billion for the fiscal year ended Aug. 31, 2012. Its home page is www.accenture.com.

Jorge L. Benitez is the chief executive—United States and senior managing director—North America for Accenture. Jorge has primary responsibility for Accenture’s business and operations in North America, including developing and executing the business strategy and driving the company’s growth in the region. Jorge most recently served as chief operating officer—Products, the largest of the company’s five operating groups. In that role, which he held for five years, Jorge led Accenture’s global business across a wide set of consumer-relevant industry groups, including: Automotive; Air, Freight & Travel Services; Consumer Goods & Services; Industrial Equipment; Infrastructure & Transportation Services; Life Sciences; and Retail. He has also served as the relationship lead for one of Accenture’s largest products clients.

Jorge’s success in business and his contributions to the broader community have been recognized on a number of occasions. Hispanic Business Magazine named him to its “2011 Top 25 Corporate Elite” list and, in 2004, selected him as one of the 100 most influential Hispanics in the United States. Jorge has led Accenture’s Minority Mentoring Program, served as Accenture’s Global People Advocate and was a member of the Accenture Foundation Board. He is on the board of the Leukemia and Lymphoma Society, a cause he feels personally passionate about, and he is involved with the Miami Chamber of Commerce and the United Way of Miami-Dade. Jorge is also deeply involved in supporting STEM education and training through his Business Roundtable membership.

Jorge graduated from the University of Florida with degrees in accounting and economics. He and his wife, Mary, an accomplished engineer, live in Miami with their three children.

Why do you believe STEM Education/workforce development is critical to our nation’s future?

We believe the demand for STEM talent—in high tech companies as well as numerous other industries—will explode in the next decade. Companies will continue vying fiercely for this talent, as they seek to compete on product innovation and as entrepreneurs create new opportunities in a rapidly expanding technology landscape. This confluence of factors continues to make STEM education and workforce development in the U.S. critical to our future.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

At Accenture, we nurture strong relationships with national minority and women’s organizations, including the National Society of Black Engineers, Society of Hispanic Professional Engineers and the Society of Women Engineers, and we have Intership recruiting programs at historically black colleges and universities, and at Hispanic-serving institutions. Additionally, our Student Empowerment Program aims at diverse sophomores pursuing careers in business and technology. We also fund scholarships that encourage minorities to pursue STEM-related degrees. These include the Accenture Scholarship Program for Minorities and our American Indian Scholarship Fund, which provides scholarships for high-achieving Native Americans seeking degrees and careers in technology or business-related fields. Additionally, we created Cayuse Technologies, a Native American-owned IT sourcing center where we provide living-wage jobs for American Indians and others in the community. There, our employees receive professional business, technical and leadership development training on an ongoing basis.

What principles do you apply to your professional and personal life to advance STEM education?

My father told me things like ‘you are known by the people you associate with’ and ‘your word is your bond.’ These may sound simplistic but they are true and have translated into my philosophy in life. As a result, I believe in the work of organizations like NPower, a national network that helps nonprofits use technology to better serve communities. Accenture supports NPower’s Technology Service Corps, which provides free IT career training to underserved young adults, through grants and volunteering. We run a similar program with Houston-based Genesis Works, while also supporting their organizational expansion across the U.S.

How can we advance mentorships and apprenticeships in the STEM pipeline?

Accenture works as nonprofits as part of our corporate citizenship initiative, Skills to Succeed, which plans to equip 500,000 people by 2015 with the skills they need to get a job or start a business. A number of our nonprofit partners focus on technical training and education, and much of our involvement helps to deliver this. For example, we team with nonprofit Year Up to mentor urban young adults, providing career skills, experience and support to help them reach their potential. Additionally, our paid undergraduate summer internships provide first-hand exposure to careers in engineering and technology.

What is your advice to those involved in promoting STEM education?

I would tell companies that they already have the resources to promote STEM education and careers—people. When Accenture engineers or software developers speak to students and describe their career paths, they help those students envision their own futures in STEM careers. I would also advise companies to team with nonprofits in relevant areas. There is incredible work going on all around the country, and, together, companies and nonprofits can make a difference in STEM and in careers for our young people.

What counsel would you provide around ‘collaboration to achieve success’ in STEM education and work force?

We believe that companies should develop private-public collaborations. For example, we partner with Upwardly Global, a nonprofit organization that works with skilled immigrants. Accenture volunteers provide resume development, mock interviews, networking practice and mentorship support. Additionally, with our help, Upwardly Global recently launched an online employment training program, which they, in turn, leveraged to partner with a national engineering firm to train and place skilled immigrants in engineering jobs.

What is the key to smart STEM investments?

Organizations should take three steps: they should plot their strategy for finding the talent they need to compete and win; they should forecast talent demand as an integral part of their talent acquisition and management strategy; and they should augment use of staffing agencies and online job boards with new kinds of intermediaries, such as online platforms and networks of retired scientists and engineers, that make it easier to match STEM demand with supply.
Mr. Rodriguez was named President and Chief Executive Officer of ADP® in November 2011. Mr. Rodriguez has been with ADP since 1999, most recently as President and Chief Operating Officer since May 2011, and previously as President of National Account Services and Employer Services International. He joined ADP through its acquisition of Vincam, where he served initially as CFO for a short period following AdP through its acquisition of Vincam, where he served initially as CFO for a short period and the Economic Club of New York. In addition to his work at Harvard University, Mr. Rodriguez serves on the Boards of AdP, Mr. Rodriguez holds master of business administration and bachelor of arts degrees from Harvard University. In addition to his work at ADP, Mr. Rodriguez serves on the Boards of ADP’s charitable foundations, which include the AdP Foundation and the AdP Foundation for Education and Workforce Development.

How has your corporation coordinated investments in education with future workforce needs?

Edanz Education Corporation is the core pillar of our corporate social responsibility strategy. Through the AdP Foundation, the company contributes to more than 20 educational institutions, representing approximately 33% of the Foundation’s direct grant funds. These technical/engineering schools and STEM represent about 47% of the Foundation’s grants. In addition, AdP’s inner city and neighborhood market programs offer the ability to support a qualified educational institution. In addition to its efforts in the U.S., AdP has committed long-term market programs specifically targeting education in India and the Philippines. We also recognize the importance of education and opening doors to young people.

Our founder, the late Henry Taub, strongly believed that education unlocked the doors to success. To honor his unwavering view that learning empowers people, ADP established the Henry Taub Scholars—a college scholarship program that recognizes outstanding academic achievement and honors five deserving children from our family of ADP associates worldwide. The Henry Taub Scholars is open to ADP associate family members who are pursuing an undergraduate college education and awards up to $20,000 in annual financial assistance for tuition and books.
Dr. Wanda M. Austin
President and Chief Executive Officer
The Aerospace Corporation

The Aerospace Corporation is an independent, nonprofit organization dedicated to the objective application of science and technology toward the solution of critical issues affecting the nation’s space program. Part of the corporation’s commitment to the future of our nation’s continued success in access to space is to inspire new generations who will continue the work of companies like The Aerospace Corporation. Aerospace has made STEM the focal point of its education outreach initiatives. Through employee volunteerism, and student and teacher collaboration, Aerospace focuses on inspiring middle and high school students to consider careers in the STEM disciplines. Our mission is to develop a systematic approach that will utilize the knowledge, skill, and expertise of technical volunteers, promoting the advancement of science and math education with our youth. The ultimate goal of these partnerships is to encourage the prospect of cultivating future engineers for the entire aerospace and defense industry.

Dr. Wanda M. Austin is president and chief executive officer of The Aerospace Corporation, a leading architect for the nation’s national security space programs. The Aerospace Corporation has nearly 4,000 employees and annual revenues of more than $850 million. She assumed this position on January 1, 2008.

She is internationally recognized for her work in satellite and payload system acquisition, systems engineering, and system simulation.

Austin served on President Obama’s Review of Human Spaceflight Plans Committee in 2009, and in 2010 was appointed to the Defense Science Board.

Austin earned a bachelor’s degree in mathematics from Franklin & Marshall College, master’s degrees in systems engineering and mathematics from the University of Pittsburgh, and a doctorate in systems engineering from the University of Southern California.

Why do you believe STEM Education/workforce development are critical to our nation’s future?

Our society is heavily dependent on science and engineering; it’s virtually impossible to be successful in today’s world without relying on technology in some form. It is widely acknowledged that the majority of jobs in the future will be technology-based. Encouraging STEM education and workforce development is critical to ensure that there will be a ready supply of young engineers and scientists to pursue science and technology to solve our critical technological problems and to serve as our future leaders. It is required to sustain our economy and to enable our participation in global leadership. For well over a decade now, the number of students studying the STEM disciplines has been declining in our country. If this continues, the United States will find itself unable to maintain or advance its own technological systems, or to compete effectively on the world stage.

How do you believe STEM education can improve a nation’s competitiveness?

A number of studies reveal that worldwide, the majority of jobs in the future will require a technically savvy workforce. In recognition of this, many other nations are increasing their investment and focus in STEM education for their population. They are graduating college-trained engineering and science students in larger numbers and a faster rate than the United States. In addition, a significant number of the STEM undergraduate and graduate students in the United States are foreign born, many of whom are returning to their native countries after graduation. As a result, there will be a global competition for critical research and development jobs, and opportunities to innovate and develop new technologies.

Beyond Standards, what are the first steps we should take to curb the STEM education crisis?

The first step is to strengthen the talent base in our teachers in K-12. In order for students to succeed in STEM areas, they must have a solid foundation of language skills, reading comprehension, math and science. Our teachers need to have the tools and training necessary to develop the natural curiosity in children. As corporate leaders, we need to apply our resources to helping our teachers and inspiring them at all levels. We also need to get the word out on the fabulous STEM careers for young people and how math and science lay a foundation for those careers. We don’t want them to opt out unknowingly.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

We have to encourage these students at home, at school and in the community. It is critical that these students have access to, and interaction with, role models who can advise them of the wonderful career opportunities that will be available to them when they succeed. By showing them these pathways to success, we will be effectively countering the obsolete but still prevalent views that these fields are “not for them.” We are starting to achieve this through programs like MathCounts, FIRST Robotics, Sally Ride Science and Change the Equation. My own company, The Aerospace Corporation, has several internal programs that encourage our scientific and technical staff to volunteer in middle and high schools, working directly with teachers and students to show real-world applications of the classroom science and math they’re studying.

How is your company connecting diversity initiatives with STEM initiatives? Is this a part of your comprehensive strategy?

Diversity and STEM initiatives must be worked jointly. We don’t have enough STEM graduates; we have even fewer STEM graduates from under-represented populations. Diversity outreach to schools is a strategic priority for us. We rely on our staffing, leadership development, and affinity groups to reach out to under-represented students in the strategic partner schools at the middle- and high-school level and at the undergraduate and post-graduate levels. We select strategic partner schools that are at the center of diverse communities, with great needs, and an abiding interest in STEM. One activity we focus on every year is our own Herndon Science Competition, named for one of our distinguished scientists and mentors. This competition, held on both coasts, offers diverse middle- and high-school students the opportunity to create innovative science projects and bring them to our campus, where our scientists and engineers, and Air Force customers judge them. Winners receive savings bonds, which we hope they will use toward education.

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Mark T. Bertolini, 56, is Chairman, Chief Executive Officer and President of Aetna Inc., a Fortune 100 diversified health care benefits company. As an early champion of using technology to drive transformational change in the U.S. health care system, Mark has helped pioneer new ways of connecting health care providers and patients to create better outcomes at lower costs. Under his leadership, Aetna has also developed innovative tools to help them make better informed decisions about their health care. Aetna offers a broad range of traditional, voluntary and consumer-directed health insurance products and related services, including medical, pharmacy, dental, behavioral health, group life and disability plans, and medical management capabilities. Medicaid health care management services, workers’ compensation administrative services and health information technology services.

Why do you believe STEM education and workforce development are critical to our nation’s future?

Our ability to compete as a nation and in business depends largely on our capacity to understand and continuously adapt to changing environments. Critical thinking skills evolve from our earliest experiences in exploring and analyzing complex problems. Yet despite modest improvements in the U.S., we are still largely failing our students by de-emphasizing the learning that fuels research and innovation in science, technology, engineering and math. As a country, we need to do more to feed and develop the innovation and aptitude in our nation’s students so that we can harness their natural tendency for discovery and exploration. And as employers, we can do more to accommodate non-conformists; today’s free-thinkers are tomorrow’s innovators. 

How do you believe STEM education can improve the nation’s competitiveness?

In the classroom, we define what matters by virtue of what is taught, measured and rewarded. Most children have a natural curiosity about how things work and the relationship between cause and effect. These behaviors are the seeds of open and inquisitive minds. Four out of five STEM college students made the decision to study STEM in high school or earlier, and one in five decided as early as middle school. Yet science classes are fading from the primary and secondary school curricula across the country. How can we expect to nurture the next generation of innovators if we do not teach, measure or reward the kind of early intellectual growth that leads to highly developed critical thinking skills?

What area of STEM are you most passionate about?

I am most passionate about technology because technological advancements are driving discovery in all of the STEM disciplines. In the past 10 years, we have witnessed developments well beyond what any of us might have imagined possible. The original smartphone was introduced in 2007. Six years later, this technology has transformed how most of us live, work, and communicate. The modern smartphone was introduced in 2007. Six years later, this technology has transformed how most of us live, work, and communicate. The modern smartphone transformed how we communicate, how we live and learn.

What do you believe is the role of STEM education in preparing a workforce for the future?

STEM education is critical to our nation’s future. We need to do more to accommodate non-conformists; today’s free-thinkers are tomorrow’s innovators. Next generation technologies will be readily available. These technologies are the seeds of open and inquisitive minds. Four out of five STEM college students made the decision to study STEM in high school or earlier, and one in five decided as early as middle school. Yet science classes are fading from the primary and secondary school curricula across the country. How can we expect to nurture the next generation of innovators if we do not teach, measure or reward the kind of early intellectual growth that leads to highly developed critical thinking skills?

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Dennis Albaugh founded Albaugh, Inc. in 1979. The company has recorded spectacular sales growth over this period assisted by product acquisitions. Today, Albaugh, Inc. is recognized as the largest wholly owned, independent formulator/packager of crop protection products in the industry. We market our products to distribution networks located in all 50 states. Albaugh, Inc. is a privately owned company founded by Dennis Albaugh in 1979. He retains 100% ownership of the company today.

The company has recorded spectacular sales growth over this period assisted by product acquisitions (the Butryac® line of products, from Rhone Poulenc), a company acquisition of Atanor SA in Argentina, and a company acquisition of a Copper Company, Agri-Estrella of Mexico, and the introduction of Albaugh-Europe.

Dennis Albaugh determined early on that he had to broaden his product portfolio to the marketplace on competitive terms to grow the company. Albaugh continues to look for such opportunities to offer products in markets for which there is no generic competition.

Dennis will continue to challenge his employees to discover new products, new customers and more efficient ways to do business, always building for tomorrow and always looking for the next jewel.

Dennis has also held to his belief that his company must have a basic position in both supply and cost for all products that it markets. This is accomplished by a cultured relationship with suppliers, in which these suppliers must not only have a competitive price, but also a secure source of supply, or through acquisition. It is because of this belief that in 1997 Dennis acquired controlling interest in an Argentina based company called Atanor.

Dennis Albaugh was born and raised in Ankeny, Iowa. He graduated from Ankeny High School in 1968. After high school, he attended Des Moines Area Community College where he received an agricultural business degree. Dennis also served his country in the National Guard until 1976.

Dennis has been married to his wife, Susan, since 1970. Together they have two daughters and four grand-daugthers. Dennis definitely spends most of his time striking a balance between spending time at work and with his family.

Why do you believe STEM Education/workforce development are critical to our nation’s future?

The better educated the workforce, the better the product a company can produce. We want to hire people who do their job and do their job well. To operate successfully with that philosophy you have to hire people who can hit the ground running. People who come from a STEM education have a specific style of thought process. We don’t hire people who have an exact skill set, but they have the ability to apply their talents and drive. When you hire an employee with a STEM education, you are hiring people who have potential. There are people with an inquisitive mind. They cannot be held hostage to antiquated concepts, because we are always looking for a better way. No matter the job title, employees are expected to contribute thoughtful solutions that continually challenge how we can improve a process, a product or a concept.

How has your corporation coordinated investments in education with future workforce needs?

One of the jewels resulting from Albaugh’s business acumen and hometown pride is Prairie Trail, a 1,000-acre planned urban development in Ankeny, Iowa. Prairie Trail is truly a private-public partnership, designed as a sustainable community where people can live and work and play. It’s part of a comprehensive conservation design approach that makes the best use of existing topography and natural waterways while also adding stunning views. The site for Prairie Trail was formerly the Iowa State University Dairy Research Farm. Mr. Albaugh was chosen as the developer in 2005, because of his commitment to business and education, fully integrated into the residential community today more than 200 residents live in the Prairie Trail development, which boasts more than 13 miles of trails and 200 acres of parks, including a state-of-the-art public aquatic center. There are also three newly built Ankeny schools in Prairie Trail. Plus, local businesses call Prairie Trail home too, sprouting up at the Plaza Shoppes, Vintage Hills and The District. It’s a tapestry of diverse and distinctive homes, neighborhood stores, nearby offices, schools and parks. And, there is much more to come.

“My interest in Prairie Trail was generated by my love for Ankeny. Ankeny has always been my hometown—I grew up here. I raised my family here, and now my daughters are raising their families in Ankeny. My vision for Prairie Trail is to create a lifestyle that I can enjoy and be proud of.”

Prairie Trail is built upon the tradition of Iowa’s great neighborhoods. Creating a great community requires involvement and investment in the future. The Prairie Trail Scholarship Program is designed to support and enrich the endeavors of the students and educators who make this their community. It’s just one of the many reasons why Prairie Trail is more than just a place to live.

Dennis majored in agri-business at DMACC. He believes it’s not about the most accomplished academic students, but about those with DRIVE. Therefore, the scholarship is not awarded on need or academic standing but on the students’ ability to demonstrate their drive and talent to the foundation how the scholarship—if awarded—can help them pursue their dreams to create their future.

The purpose of the Prairie Trail Scholarship Fund is to provide scholarships to students pursuing a college degree and to provide mini-grants to educators teaching in the Ankeny school system. The scholarship applicants are eligible for a maximum lifetime award of $10,000. Preference is given to students who reside in the Prairie Trail Development and to those who choose an institution based in Iowa.

The mini-grants are available to educators teaching in public or private Ankeny schools, K-12. Mini-grants are a maximum of $5,000 per award and designed to enhance the education in the classroom. Examples of previously awarded mini-grants include funding for a science lab and classroom equipment and materials and a new math program for K-6, titled: Pearson’s enVision Math. The funding provided assistance for a special math emphasis night and incorporated games and academic exercises at home so that parents could become more familiar with the new curriculum.

What is the STEM initiative that your company has supported are you most proud?

We are extremely proud of Prairie Trail, the public-private partnership and the very positive impact on an already outstanding Ankeny school system. Newsweek just recognized the top 2,000 public high schools in the U.S and we’re very proud that Ankeny High was one of the sixteen Iowa high schools recognized.

What is your advice on using public-private partnerships to tackle our most pressing education challenges in STEM?

Education is an important part of every person’s life. I am a firm believer in giving Ankeny’s children support as they go on to pursue their dreams. The Prairie Trail Scholarship Program is designed to accomplish just that."

What counsel would you provide around “collaboration to achieve success” in STEM education and workforce development?

It is important that public and private entities collaborate to help our children achieve success as the next generation of workforce. It is also important to take advantage of new circumstances on a personal level or a national economic level, can strip people of their job and status, but an education can never be taken away. Hard work does not guarantee success but knowledge is not just a personal exercise or a coming of age milestone, it is a purposeful endeavor that spreads benefits throughout our communities.

Learn more: www.prairietrailankeny.com and www.albaughinc.com
Klaus Kleinfeld
Chairman and Chief Executive Officer
Alcoa

Alcoa is the world’s leading producer of primary and fabricated aluminum, and the world’s largest miner of bauxite and refiner of alumina. In addition to inventing the modern-day aluminum industry, Alcoa innovation has been behind milestones in the aerospace, automotive, packaging, building and construction, commercial transportation, consumer electronics, and industrial markets over the past 125 years. Sustainability is an integral part of Alcoa’s operating practices and the product design and engineering it provides to customers. Alcoa has been a member of the Dow Jones Sustainability Index for 11 consecutive years and approximately 75 percent of all of the aluminum ever produced since 1888 is still in use today. In 2011, Alcoa and Alcoa Foundation gave away $38 million to nonprofits around the world. Alcoa employs approximately 61,000 people in 30 countries across the world. For more information, visit www.alcoa.com and follow @Alcoa on Twitter at twitter.com/Alcoa.

Klaus Kleinfeld is chairman and chief executive officer of Alcoa. He joined the company in 2007 as president and chief operating officer, and seven months later assumed CEO responsibilities. He has served on Alcoa’s Board of Directors since 2003 and was named chairman in April 2010. Mr. Kleinfeld also serves on the Board of Directors of Alcoa Foundation.

Under Mr. Kleinfeld’s leadership, Alcoa’s businesses and the Alcoa Foundation have supported STEM education in primary and secondary schools, and technical training at community colleges and four-year engineering universities with positive results. In 2012, Alcoa Foundation spent $4.5 million on STEM and workforce development programs in the US and internationally, and offered 246 internships at the Company’s facilities around the country.

In July 2012, together with Richard Haas, president of the Council on Foreign Relations, Kleinfeld wrote a USA Today Op-Ed outlining the need to invest in a common core curriculum for STEM and industry-endorsed training programs that give graduates nationally recognized, portable skills, and create an online skills database that links students, community colleges and employers. In early 2013, Kleinfeld joined other CEOs and Change the Equation to voice support for the new Common Core State Standards.

Before Alcoa, Kleinfeld had a 20-year career with Siemens, the global electronics and industrial conglomerate, based in the U.S. and Germany, where he served as chief executive officer of Siemens AG starting in 2005.

Kleinfeld is a member of the Supervisory Board of Bayer AG and the Board of Directors of Morgan Stanley. He is a member of the Brookings Institution Board of Trustees; the Board of Directors of the World Economic Forum USA; and he serves as the Chairman of the U.S.-Russia Business Council.

How do you believe STEM education can improve a nation’s economy?
Manufacturing plays a huge role in driving U.S. competitiveness, and STEM is vital to America’s success in manufacturing. Consider that manufacturing represents 68% of U.S. R&D spend, produces 95% of all patents developed in the US, and pays its employees higher average salaries than other industries. The impact grows when you then consider the “multiplier effect” of manufacturing jobs—for example, every Alcoa manufacturing job generates 2.5 to 3 additional jobs for our suppliers and partners.

According to a 2011 Skills Gap Survey by Manufacturing Institute and Deloitte, 600,000 manufacturing jobs are unfilled because manufacturers cannot find qualified applicants with the right skills. Because this is hamstringing the nation’s ability to grow a stronger middle class, strengthen our economy and compete, it means that we must invest in STEM to get people ready to take jobs in Advanced Manufacturing and other industries requiring technical skills.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?
With a strong commitment to diversity among our 61,000 employees in 30 countries, Alcoa is uniquely positioned to form—and inform—initiatives that address educational and skill development challenges, particularly for girls and minorities:

• In primary and middle schools, we support organizations like Academy of Model Aeronautics, which provides model airplane kits as a vehicle for promoting STEM education and careers.

• At the high school level, we partner with Junior Achievement, which delivers hands-on curriculum and engages trained classroom volunteers.

• At the college level, we partner with the Society of Women Engineers (SWE) to enlist college students to serve as mentors to girls on STEM projects. Through creative programming and ongoing involvement of dynamic female leaders in engineering, we want to inspire the next generation. We support similar partnerships with the National Society of Black Engineers and the Society of Hispanic Professional Engineers.

What do corporations need to do to create more STEM careers and fill existing jobs?

According to a recent survey, only 20% of parents would want their children to pursue a manufacturing career. We have to change that perception by educating students, teachers, career counselors and parents about the varied opportunities that advanced manufacturing offers—and that many require STEM skills.

In addition to rebranding manufacturing, corporations should invest in education, training and apprenticeships; be advocates for the adoption of STEM common core standards in K-12 schools; and contributing financial resources and expertise to vocational and community college programs.

Where do you see the biggest area of opportunity in advancing STEM jobs/careers?
Baby Boomers are retiring and the skills gap is growing. Many of these workers built careers as skilled tradesmen, operators and supervisors. Today’s manufacturers now often rely on precision machinery, computer modeling and high-tech tools—skills far removed from the traditional assembly line and requiring some degree of competency in STEM disciplines.

Alcoa’s partnership with the Manufacturing Institute, a nonprofit research organization affiliated with the National Association of Manufacturers, is helping community colleges develop industry-recognized certification programs to individuals, including US Veterans. Developed with industry input and support, these programs give students a solid, relevant education they can take with them wherever the job market leads. States should build on this strong foundation and encourage community colleges to adopt and expand these programs.

What is your advice on using public-private partnerships to tackle our most pressing education challenges in STEM?
Among the 30 developed countries ranked by the Organization of Economic Co-operation and Development, the U.S. ranked 25th in math and 21st in science. We are woefully behind. The only way to change this situation is through public-private partnerships; industry identifies the needed skills, schools provide training, and the public sector creates a supportive environment through policy and funding. One example is Alcoa’s partnership with Trident Tech College, a two-year technical college in Mt. Holly, South Carolina. Together with local manufacturers we developed the first US Department of Labor-certified production technology apprentice program. Apprentices attended classes one day per week and worked full-time for 18 months. Their replicable coursework had many applications in areas such as lean manufacturing, safety, problem solving, communications and financial planning.

In an age of constrained resources, we need to be realistic about what we can ask government to do. The academic, NGO and business communities have an opportunity to make a meaningful contribution in STEM education and workforce development. The key to success will be partnership.
Pierre L. Gauthier
President & Chief Executive Officer
Alstom U.S. & Canada

Alstom is a global leader in the world of power generation, power transmission and rail infrastructure and sets the benchmark for innovative and environmentally friendly technologies. For nearly 100 years, Alstom has been a leading provider of vital equipment and services for the U.S. power generation and rail transportation markets. Drawing on the expertise of 93,000 professionals in more than 100 countries, and 7,000 employees in the U.S., Alstom is driving the development of new technologies to meet rising demand for energy and alleviate urban congestion while minimizing impacts on the environment.

Why do you believe STEM education/workforce development is critical to our nation’s future?
We simply cannot preserve America’s role as an epicenter of innovation, create new jobs and make our country more competitive on the global market without doubling-down on efforts to train a more STEM-oriented workforce.

What traits do corporate leaders need to effectively support and advance STEM education today?
CEO’s have laser-like focus on their bottom lines. They constantly look for new ways to increase their company’s market share and profit margins, and they recognize that offering innovative new products is a way of doing both.

CEO’s therefore have a vested interest in becoming advocates for STEM, which is one reason I’m so passionate about this subject. I would encourage my peers to seek out more opportunities to speak with students—even students in middle and high school—about the exciting careers they could pursue in fields like computer sciences, clean energy and smart grid systems. If we help them understand and get excited about ways they and society can benefit from their pursuit of a STEM education, we all will realize benefits that extend far beyond the bottom line.

What area of STEM are you most passionate about?
I have a particularly strong desire to see more formalized STEM internship programs put in place as a way to help bridge the gap between employers’ STEM-specific workforce needs and students’ long-term education and career plans.

What do we need in the US to continue to be at the top of global innovation?
We need to expand America’s 21st century manufacturing base. By putting in place the right mix of policy and infrastructure to attract new investments in high-precision, state-of-the-art manufacturing, we can avoid an outbound migration of our nation’s best and brightest minds whose technology and innovation jobs are linked to that manufacturing activity.

We simply cannot preserve America’s role as an epicenter of innovation, create new jobs and make our country more competitive on the global market without doubling-down on efforts to train a more STEM-oriented workforce.”
Ameren Corporation

Ameren Corporation, a Fortune 500 energy company headquartered in St. Louis, powers the quality of life for 3.3 million customers across 64,000 square miles in Missouri and Illinois. The service territory includes a diverse base of residential, commercial and large industrial customers in both urban and rural areas. Fifty-five percent of Ameren’s 9,000 employees are engineers, technicians and information technology specialists. These employees’ STEM skills are essential in maintaining 12,000 megawatts of net generation capacity, 66,000 electric circuit miles, and 21,000 miles of natural gas transmission and distribution mains as well as providing safe, reliable and environmentally-responsible energy to Ameren customers.

Thomas R. Voss is chairman, president and CEO of Ameren Corporation. He was elected to his position of chairman of the board of directors in April 2010 and president and CEO in May 2009.

Voss began his career with the company in 1969 as a student engineer after earning a bachelor’s degree in electrical engineering from the University of Missouri-Rolla. After serving four years in the U.S. Air Force, he returned as an assistant engineer.

From 1975 to 1998, he held a series of successively higher positions—moving from engineer to staff engineer, superintendent, district manager, operating manager and vice president of Region Operations in Illinois. Voss, who has served for more than 30 years in Energy Delivery, led that organization from 1999 to 2003. In those years, he was senior vice president of Energy Delivery and Customer Service. From 2003 to 2009, he was vice president of Generation and president of Ameren Energy and Ameren Energy Resources.

He held the position of executive vice president and chief operating officer of Ameren from 2004 to 2009. In 2006, he was elected to the additional position of president and CEO of Ameren Missouri.

Voss is a graduate of the University of Michigan’s Public Utility Executive Program and the Westinghouse Advanced Power Systems School in Pittsburgh. In 2005, he completed the Reactor Technology Course for Utility Executives—an intensive three-week program on nuclear technology offered through MIT and the National Academy for Nuclear Training. Voss is a registered professional engineer in Missouri and Illinois.

He also serves on several national industry boards including Edison Electric Institute (executive committee) and is the current president of the Association of Edison Illuminating Companies. In 2011, Voss was selected by the National Society of Professional Engineers for national recognition as the recipient of PEI’s Distinguished Service Award.

What area of STEM are you most passionate about? All of them. As an electrical engineer myself, I understand the importance of a strong science, technology, engineering and mathematics education. Our world is becoming ever more complex. We must provide our educational opportunities for our youth to meet the technical challenges of the future.

What principles do you apply to your professional and personal life to advance STEM education? Personally, recognition of the importance of math and science skills is a family affair. STEM was central to my education and Carol, my wife, is a former high school teacher. We encouraged STEM education with our children, and our daughter became a nuclear engineer. Now we’re encouraging our grandchildren to embrace math and science.

Professionally, our company has several programs in support of STEM education and many of my colleagues are very devoted to advancing its importance, particularly for women and minorities.

How do you encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities? The workforce of today and the future must tap into a diverse range of nationalities, backgrounds and races. For our company in particular, STEM plays a critical role in equipping our current and future workforce and our company to succeed. We are active in several initiatives to build relationships with a diverse group of students and support their interest in the energy field, starting at the grade school level.

We support Teach for America-St. Louis and are also working with The St. Louis American through its newspaper in education program to provide classroom tools for STEM education for third, fourth and fifth graders in the St. Louis Public School and Normandy School districts.

Several local high schools have Project Lead the Way curriculum. Ameren engineers visit these schools to share with the students the importance of focusing on STEM education. As part of the sharing process, for example, in mid-April, 75 area high school students and teachers were at our St. Louis headquarters to meet with some of our engineers and learn firsthand how the engineering design process can lead to real-world challenges and opportunities.

We also collaborate with several community colleges such as Southwestern Illinois College to develop and offer pre-employment training programs. Our company is particularly proud that from senior level to front line, our co-workers volunteer their time at area high schools and minority-student organizations on local college and university campuses. They’ve also increased our recruiting efforts at historically black colleges and universities to seek qualified candidates.

During and after college, our college students work in co-op programs of more than 70 individuals annually and the vast majority of those students fall into STEM areas. Our Human Resources team has made a concerted effort to bring more diversity to the intern and co-op program by reaching out to women and minority-student organizations on local college and university campuses. They’ve also increased our recruiting efforts at historically black colleges and universities to seek qualified candidates.

Where do you see the biggest area of opportunity in advancing STEM jobs/careers? Our Industry is in the midst of a technological boom. The growth of smart grid systems and the modernization of our infrastructure are creating opportunities that did not exist five years ago. This is occurring at the same time that we are managing through a wave of baby boomers exiting our workforce. Half of our employees are over the age of 49 and will retire in the foreseeable future, creating great opportunities for our future employees.

How is your company connecting diversity initiatives with STEM initiatives? Is this a part of your comprehensive strategy? Ameren is widely recognized for our accomplishments in diversity. For the last three years, DiversityInc has ranked Ameren among its top 5 utilities for workplace diversity, while our Diversity Council is among the top 25 in the nation. We have an internship and co-op program of more than 70 individuals annually and the vast majority of those students fall into STEM areas. Our Human Resources team has made a concerted effort to bring more diversity to the intern and co-op program by reaching out to women and minority-student organizations on local college and university campuses. They’ve increased our recruiting efforts at historically black colleges and universities to seek qualified candidates. HP+ is also playing off. We are seeing an increase in candidates from under-represented groups in our 2013 class of interns and co-ops.

I think it is important for companies—especially utilities—to be inclusive in hiring from the communities they serve. We reflect and support the communities we serve because we live and work in them as well.

We are focused on our community obligations and on providing the energy that powers our quality of life.
Robert A. Bradway
Chairman and Chief Executive Officer
Amgen

Amgen discovers, develops, manufactures, and delivers innovative human therapeutics. A biotechnology pioneer since 1980, Amgen was one of the first companies to realize the new science’s promise by bringing safe, effective medicines from lab to manufacturing plant to patient. Amgen therapeutics have changed the practice of medicine, helping millions of people around the world in the fight against cancer, kidney disease, rheumatoid arthritis, bone disease, and other serious illnesses. With a deep and broad pipeline of potential new medicines, Amgen remains committed to advancing science to dramatically improve people’s lives. For more information, visit www.amgen.com and follow us on www.twitter.com/amgen.

The story of Amgen began with a very simple hypothesis: that emerging research in genetics could lead to very exciting opportunities if the right scientists could be assembled and given the appropriate resources. More than three decades ago, a small group of visionary investors and pioneering scientists came together in an effort to push the boundaries of scientific discovery and imagine a future that few others could see at the time. Amgen has since grown to become the world’s largest biotechnology company, having served more than 25 million patients with its medicines. As a company, we could not have accomplished what we have were it not for our commitment to build a culture that embraces science and innovation—a culture that continues to shape who we are today.

Throughout history, advances in science and technology have led to countless far-reaching benefits, including increased efficiencies, greater societal prosperity, and dramatic improvements in human health and well-being. Many of those advances came about due to significant financial investments in innovation and through the passion of scientists willing to challenge conventional thought in a particular technical area. The danger we face today is the possibility that fewer people will enter highly technical fields in the decades ahead, at a time when demand for individuals with these kinds of skills is on the rise.

As Chairman and Chief Executive Officer at Amgen, a company that employs thousands of scientists in its effort to discover, develop, manufacture, and deliver medicines, I know what can be achieved when investments are made in science—and in scientists. I’ve seen the lives of patients transformed as a result of new medicines we’ve discovered, developed and manufactured—and I’ve seen the unrelenting passion of scientists who work on those kinds of therapies. It’s shown me how rewarding it can be to pursue science as a career—and the broad-based benefits that science, technology, engineering, and math (STEM) disciplines can provide.

“...I know what can be achieved when investments are made in science—and in scientists.”
Michael J. Long
Chairman, President and Chief Executive Officer
Arrow Electronics, Inc.

Arrow Electronics is a Fortune 150 global electronics services provider delivering components and technology solutions to a breadth of markets, including telecommunications, information systems, transportation, lighting, medical, industrial and consumer electronics. Arrow initiatives guide the next generation of courageous innovators to look five years out and create smart solutions that explore the boundaries of what’s possible and deliver what’s practical. This focus necessitates a commitment to STEM education programs that will not only improve literacy in specific areas, but show students how to be innovators and turn their technological inspirations into real products with commercial potential. These programs include FIRST Robotics and the development of new curricula focused on the innovation process.

Arrow Electronics guides today’s innovators to a better tomorrow. With our help, our partners transform their ideas into real and influential achievements. And just as technology touches all facets of our lives, we intend to foster new, cross-cutting collaborations with our corporate social responsibility partners. Our innovations can make the world a better place for us all—now and five years out.

This CSR program is an outgrowth of Arrow’s focus to be a reliable guide between what is technologically practical now and what is tangibly possible. Nowhere will that goal be better expressed than in our support of STEM education programs.

In order to guide a new generation of innovators, we are exploring programs that seek to build on our nation’s growing STEM successes and develop educational programs that emphasize innovation. We need to create a generation of STEM-literate innovators who can not only invent new technologies, but advance and amplify their own pursuits across business, science or the humanities. It means not only mastering technical knowledge, but developing the necessary personal skills and characteristics of a successful innovator, such as working in teams, critical thinking, solving problems using multiple disciplines, perseverance, calculated risk-taking and learning from your mistakes.

Educating a generation of new innovators will require some new approaches and some prototyping. Teachers will need new and different training, as well as toolkits, so they may guide their students in the innovation education process.

“...”

Michael J. Long is chairman, president and chief executive officer (CEO) of Arrow Electronics, Inc.

Prior to being named CEO in May 2009, Long served as president and chief operating officer (COO) of Arrow, with responsibility for all of the company’s operations and business units. Before that, Long served as senior vice president of Arrow and president of the company’s Global Components business with responsibility for overseeing Arrow’s semiconductor, passive, electromechanical and connector products and services businesses worldwide.

Long has been with Arrow since 1991 when Arrow merged with Schweber Electronics, a company where he held various leadership roles from 1983 to 1990. In 1994, Long was president, Capstone Electronics, an Arrow company, and from 1995 to 1999, he was president, Gates/Arrow Distributing. From 1998 to 2005, Long was president and COO, Arrow North American Computer Products (now Arrow Enterprise Computing Solutions). As a result of his success in running and growing this business, Long was named one of Computer Reseller News’ “Top 25 Executives” in 2002 and 2004. Long also served as president, North America and Asia/Pacific components.

Long holds a bachelor’s degree in business administration from the University of Wisconsin and attended the Milwaukee School of Engineering. He is active in the Young Presidents’ Organization, a global peer networking group. He serves on the Board of Directors of AmerisourceBergen. He is also on the Board of Directors for the Denver Zoo.

Harvard’s Tony Wagner says it best: “What matters today is not how much our students know, but what they can do with what they know. Learning in most conventional education settings is a passive experience: The students listen. But at the most innovative schools, classes are “hands-on,” and students are creators, not mere consumers. They acquire skills and knowledge while solving a problem, creating a product or generating a new understanding.”

For older students, Arrow Electronics has engaged with FIRST Robotics and other programs that require participants to apply all the skills of an innovator and resolve the tension between the practical and possible in technological competitions. We also seek new partnerships with other disciplines, such as the arts, as we approach how STEM topics and the innovation process are presented in younger grades. Arrow Electronics supports the arts out of a fundamental conviction that the creative process in the arts and innovation in Arrow’s world of electronics are intrinsically connected. When the traditional lines between business, education and art are blurred, Arrow believes that magic—innovation—happens.
Randall Stephenson became chairman and chief executive officer of AT&T Inc. in 2007, and in the years following he has transformed the company into a global leader in mobile Internet services and IP-based business communications solutions. Under Mr. Stephenson’s leadership, AT&T has dramatically expanded its focus to provide industry leadership in mobile Internet, high-speed broadband, cloud and network security as well as its fast-growing AT&T U-verse platform for integrated TV, data and voice services that will reach 33 million customer locations by year-end 2015.

AT&T is today the world’s largest telecommunications company with more than $127 billion in 2012 revenues and 29 consecutive years of dividend growth. Over the past five years, AT&T has invested more capital into the U.S. economy than any other public company. AT&T is today the world’s largest telecommunications company with more than $127 billion in 2012 revenues and 29 consecutive years of dividend growth. Over the past five years, AT&T has invested more capital into the U.S. economy than any other public company.

Randall Stephenson began his career with Southwestern Bell Telephone in 1982 in Oklahoma. From 2001 to 2004, he was the company’s senior executive vice president and chief financial officer, and from 2004 to 2007, he served as the company’s chief operating officer. He was appointed to AT&T’s board of directors in 2005.

Mr. Stephenson has overseen AT&T’s largest education initiative in the company’s history—AT&T Aspire, a philanthropic program to help improve college/career readiness for students at risk of dropping out of high school. Launched in 2008, Aspire I invested more than $100 million to support educational initiatives. In 2012, AT&T announced Aspire II, a new and expanded financial commitment of $250 million planned over the next five years.

Mr. Stephenson has made AT&T’s breakthrough “It Can Wait” campaign—an education and public awareness program encouraging people to never text while driving.

Randall Stephenson, Chairman and Chief Executive Officer
AT&T Inc.

Since 1987, AT&T and the AT&T Foundation have given $90 million to support STEM efforts. Major initiatives include the following:

- Most recently, AT&T joined with Udacity and the Georgia Institute of Technology College of Computing to pioneer the first-ever professional Online Master of Science degree in computer science that can be earned completely through the “massive online” format. Enrolled students will only pay a fraction of the cost of a traditional on-campus master’s program, putting a computer science degree within the reach of many more young people.
- AT&T has incorporated an emphasis on STEM in the second phase of Aspires—the company’s signature education initiative to improve high school graduation rates and better prepare students for college and careers.

Why do you believe STEM education/workforce development is critical to a nation’s future?

History tells us that whenever you improve productivity, economic velocity rises. We see that clearly with the mobile Internet, which has proven to be almost unprecedented in its ability to increase productivity while transforming how we live and how we do business. It follows that developing STEM skills in young people will be increasingly important to a country’s ability to innovate and compete. Here in the U.S., unfortunately, there is mismatch between the demand for skilled workers and the available supply. We need to turn that around.

How do you believe STEM education can improve a nation’s competitiveness?

In a world where every job is being transformed by technology, the nations with the best STEM training will always have the advantage. That’s why I’m especially excited about our collaboration with the Georgia Institute of Technology College of Computing, it will allow anyone with a broadband connection to learn from some of the finest computer science instructors in the world, and do so at a fraction of the cost. Programs like this will be important in delivering access and opportunity for more and more people to participate where we need them most.

What are the first steps we should take to curb the STEM education crisis?

I would suggest focusing on three broad areas. First, we have to invest in programs and technologies that introduce young people to STEM disciplines at an early age—and continue that focus all the way through high school and college. Second, we must help students see the link between their STEM studies and the skills they need for a successful 21st century career. Third, we must help students see the link between their STEM studies and the skills they need for a successful 21st century career.

What STEM initiative that your company has supported are you most proud?

The most impressive initiatives I’ve seen. The program is designed to inspire high school girls to pursue STEM careers. Close to 900 volunteers, including many AT&T employees, helped reach more than 6,000 high school girls in economically disadvantaged communities across the country. And we found that girls who participated showed increased interest in science and math courses and STEM activities outside of school. They also improved their confidence, along with their critical thinking and problem-solving skills.

What STEM initiative that your company has supported are you most proud?

The Girl Scouts National STEM hands-on learning program, IMAGINE Your STEM Future, is one of the most impressive initiatives I’ve seen. The program is designed to inspire high school girls to pursue STEM careers. Close to 900 volunteers, including many AT&T employees, helped reach more than 6,000 high school girls in economically disadvantaged communities across the country. And we found that girls who participated showed increased interest in science and math courses and STEM activities outside of school. They also improved their confidence, along with their critical thinking and problem-solving skills.

In a world where every job is being transformed by technology, the nations with the best STEM training will always have the advantage.”

“Why do you believe STEM education/workforce development is critical to a nation’s future? History tells us that whenever you improve productivity, economic velocity rises. We see that clearly with the mobile Internet, which has proven to be almost unprecedented in its ability to increase productivity while transforming how we live and how we do business. It follows that developing STEM skills in young people will be increasingly important to a country’s ability to innovate and compete. Here in the U.S., unfortunately, there is mismatch between the demand for skilled workers and the available supply. We need to turn that around.”

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“In a world where every job is being transformed by technology, the nations with the best STEM training will always have the advantage.”
Why do you believe STEM education/workforce development is critical to our nation's future? I tell my employees that the only thing constant is change. Our world is evolving, technology changes the way we do business, customer requirements demand product innovation, and budget constraints dictate doing more with less. To ensure national security, to gain global market share, and to sustain our environment and our quality of life, the United States must continue to develop our current and future workforce.

What traits do corporate leaders need to effectively support and advance STEM education today? Corporate leaders need to understand the global consequences of a workforce with flat or declining STEM skills and expertise. Businesses must invest in their own talent and R&D efforts, but also support the student pipeline in their communities. Leaders should deploy employees into local schools and universities to provide hands-on experiences and to financially support STEM education efforts through scholarships, competitions, resources and partnerships. In order to compete in a global environment, it benefits companies to ensure the employee pipeline is well educated and trained, beginning at a very young age.

How can we do a better job to strategically coordinate and those engaged in STEM across the company? ATK has a Technology Council comprised of leaders across the company. These STEM professionals not only discuss emerging technologies in research, development and manufacturing, but they engage in employee development, cross-training rotations, and mentorships. The company engages employees in STEM projects at our local facilities as part of our corporate social responsibility activities and reports on such efforts via internal communications and external reporting. Finally, functional leaders across the company participate in our capital deployment discussions to ensure all areas of the business understand our priorities.

Establishing STEM education and investment is a priority that begins at the top. Many good initiatives fill our day and require our attention. If we don’t set our priorities, we fail our customers, our communities and our shareholders depend on corporate leaders to set the vision and to pave the way.

How has your corporation coordinated investments in education with future workforce needs? ATK operates in 21 states, Puerto Rico and internationally. Several of our sites support local college and university scholarship programs. Employees participate in and financially support local school initiatives such as bridge building, aerospace and energy technology projects, and camps for students interested in STEM fields of study. ATK also rotates MBA students and interns through several STEM functions for college credit and future employment.

What area of STEM are you most passionate about? Engineering is a fundamental driver in our business. We employ a variety of highly skilled professionals in aerospace, chemical, computer, electrical, environmental, industrial, manufacturing, mechanical, and nuclear engineering. Their efforts to exceed customer requirements, eliminate waste, save energy, improve safety, reduce down time, and ensure quality not only impact the bottom and top lines, they support national security, achieve missions in space, and send employees home safely to their loved ones each day. I am grateful for their diligence and passion.

How is your company connecting diversity initiatives and STEM initiatives? Is this a part of your comprehensive strategy? Both diversity and STEM are key company-wide initiatives. I believe the two are naturally connected. As our markets become increasingly competitive and as we strive to expand our international business, ATK knows that investing in the STEM education pipeline and attracting top talent with diverse backgrounds and experiences will help us maintain our leadership positions. This year, ATK will challenge its Technology Council to expand its reach in terms of cross-enterprise STEM support and partner with our human resources teams to support talent development, diversity, and recruitment.  

“To ensure national security, to gain global market share, and to sustain our environment and our quality of life, the United States must continue to develop our current and future workforce.”

Mark W. DeYoung
President and Chief Executive Officer
ATK

ATK is an aerospace, defense, and commercial products company with operations in 21 states, Puerto Rico, and internationally.

ATK’s partnership with education encompasses local, regional and national initiatives to engage students in becoming scientifically literate and prepared to enter the workforce as leaders and problem-solvers. ATK focuses on fostering student interest and achievement in the areas of science, technology, engineering and mathematics (STEM). Partnerships range from mentoring students at local science fairs to funding conferences and competitions to providing students with opportunities outside the classroom to explore career interests and test their skills. ATK is committed to providing these opportunities for our next generation of scientists, engineers and explorers.

Mark W. DeYoung is President and CEO of ATK, an aerospace, defense, and commercial products company.

Before becoming ATK’s President and Chief Executive Officer in February, 2010, Mark led ATK’s Armament Systems group as President of the company’s largest business. In this capacity, he created the world’s leading munitions organization and oversaw the group’s expansion into new markets and capabilities. Under Mark’s leadership the group grew from approximately $600 million of revenue in fiscal year 2003 to $2.1 billion of revenue in fiscal year 2010.

Mark’s history with the company spans nearly three decades and all of ATK’s business groups and product lines. His leadership and program experiences range from the company’s core competencies in advanced engineering, munitions, commercial products, and propulsion, to key growth areas like composite structures manufacturing.

He has more than 20 years of extensive experience in finance, operations, government facility management, and executive leadership, including business startup and turnarounds. Mark has held numerous leadership positions in finance and operations in solid rocket motors, tactical systems and conventional munitions businesses. He has a bachelor’s degree in management from Weber State University and a Master of Business Administration from Westminster College.

As CEO, Mark emphasizes a culture of responsibility at ATK by insisting upon ethical behavior, environmental stewardship and a focus on safety. ATK also gives back to the communities where it operates, through a partnership with the United Way, and by supporting education initiatives at the national, state, and local levels. ATK promotes and invests in science, technology, engineering and math initiatives in local schools and brings professionals to the classroom to provide hands-on experiences for students.

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Linda Parker Hudson
President & Chief Executive Officer
BAE Systems, Inc.

BAE Systems, Inc. is the U.S. subsidiary of BAE Systems plc, a global defense, security and aerospace company which delivers a full range of products and services for air, land and naval forces, as well as advanced electronics, security, information technology solutions and customer support services.

Headquartered in Arlington, Va., BAE Systems, Inc. employs approximately 40,100 in the United States, United Kingdom, Sweden, Israel, and South Africa, and generated 2012 sales of $12.76 billion. The company provides support and service solutions for current and future defense, intelligence, and civilian systems; designs, develops and manufactures a wide range of electronic systems and subsystems for both military and commercial applications; and designs, develops, produces, and provides service support of armored combat vehicles, artillery systems, and munitions.

Linda Hudson is the president & CEO of BAE Systems, Inc. She leads approximately 43,000 employees in the United States, United Kingdom, Sweden, Israel and South Africa. BAE Systems, Inc. had 2011 revenues of $14.4 billion and is a U.S.-based, wholly owned subsidiary of BAE Systems plc, headquartered in London.

Previously, Hudson was president of BAE Systems’ Land & Armaments operating group, a role she began in January 2007. Land & Armaments is the world’s largest military vehicle and equipment business, with operations around the world.

Prior to joining BAE Systems, she served for seven years as an officer and vice president of the General Dynamics Corporation, and was president of General Dynamics Armament and Technical Products in Charlotte, N.C.

Hudson has held a variety of senior management positions in engineering, production operations, program management and business development during a period of significant consolidation in the defense industry. Beginning her career with the Harry Corporation and Ford Aerospace, she then led organizations at Martin Marietta through the Lockheed Martin merger and a subsequent divestiture to General Dynamics.

A graduate of the University of Florida, Hudson received her bachelor’s degree with honors in Systems Engineering and is a member of the Industrial and Systems Engineering Hall of Fame.

Hudson has received numerous accolades and recognitions for her professional accomplishments and her philanthropic activities. She has been featured in numerous print articles in periodicals like the Wall Street Journal, New York Times and Forbes.

She currently serves on the Board of Directors of organizations such as Smithsonian National Air and Space Museum, Executive Committee of the Aerospace Industries Association and supports efforts like Change the Equation.

For the past three years, Hudson was named one of Fortune Magazine’s 50 Most Powerful Women in Business and, in 2010, was named as one of the 100 Most Powerful Women in Washington, D.C., by Washingtonian Magazine.

Why do you believe STEM education/workforce development is critical to our nation’s future?

Development of the STEM workforce isn’t just critical to our nation’s economic future. It’s also essential to our national security. Unfortunately, modern US students are shying away from science and math degrees, and the competition for the candidates who remain is fierce.

When I was young, the race to put a man on the moon inspired and attracted an entire generation of engineers to aerospace and defense. Today, many of those STEM-minded students would much rather work at Google or Facebook. It’s very difficult for our industry to compete for this talent, especially as budget cuts and sequestration make a defense-related career seem that much less attractive to new graduates.

In the public policy arena, we talk a lot about the importance of preserving our nation’s defense industrial base. But we would be shortsighted not to worry about our nation’s defense intellectual base as well.

We need to do a better job attracting students, not just to STEM, but to our industry. Our national security depends on it.

What do corporations need to do to create more STEM careers and fill existing jobs?

There is no dearth of STEM careers at BAE Systems, but there is a shortage of qualified candidates. Unfortunately, our industry doesn’t get access to all the STEM graduates to whom we’d like to have access. In part, that’s due to an image problem that we have perpetuated over the years. Young people today want flexibility and openness. They don’t like arbitrary hierarchies, fixed work schedules, and red tape. Many perceive defense and aerospace as a dinosaur of an industry populated by legions of drones sitting in seas of cubicles. But the reality is that a lot of the work we do on a daily basis would blow your mind. It’s very exciting work, but we don’t do a very good job selling that.

At BAE Systems, we recognize that attracting top, new talent begins with fundamentally changing our culture to become more appealing to a changing workforce. We’re embarking on a multi-year journey to go from being a “good employer” to becoming a “great place to work.” It’s not going to be easy, but it’s what we really want the pick of the litter when it comes to newly minted STEM graduates. You’ll probably never find a playground slide in our headquarters or people bringing their dogs to work at our electronics assembly lines, but you will find a real commitment to our customers—the men and women who protect and serve our nation. We need to do a better job at sharing that passion with potential new hires.

What principles do you apply to your professional and personal life to advance STEM education?

I believe advancing STEM education and advancing diversity and inclusion are closely tied. When it comes to encouraging students to pursue science and math, historically the U.S. has done a pretty good job at attracting off more than half of the student body. That has put us at a severe economic disadvantage to large portions of the developing world.

That needs to change, and I’ve made it a professional priority to play a role in leading and driving that change at BAE Systems and previous employers. In my personal life, I devote a lot of time, money and expertise to a number of organizations supporting STEM-related and related issues. I’m especially proud of my work with the University of Florida and its efforts to develop female engineers and leaders of the future.

How is your company connecting diversity initiatives with STEM initiatives?

If research has shown us anything, it’s the impact that societal and workplace “unconscious bias” can have deterring women and other underrepresented groups from pursuing STEM careers. Women are an enormous potential STEM resource to which the U.S. has historically largely turned a blind eye.

We need to encourage more young girls and women to pursue STEM-related studies and careers, and we need to combat the often hidden cultural obstacles that push them away.

Ours is a very male-dominated industry, and despite the impressive and welcome explosion of women at the top in recent months, we’re still not seeing the necessary level of diversity throughout the organization—especially in the STEM fields. As part of our diversity and inclusion strategy at BAE Systems, we’ve made unconscious bias training mandatory for everyone at leadership levels. We’re also requiring diverse slates of candidates and interview panels when hiring into leadership roles. Finally, we continue to sponsor a number of important external professional groups that promote the professional advancement of diverse talent in STEM fields.

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How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities? We believe very deeply at Battelle in providing educational opportunity to students of every background. The STEM schools we support are inclusive — there are no requirements, such as test scores, for admission, and students master the content of every subject before moving onto the next course. We encourage students to continue in STEM subjects by proving to them, with their own results, that they can perform and excel in STEM subjects. And we provide them with STEM role models, women and men whom they can relate to, and who have themselves shown that students from every walk of life are can thrive in STEM.

How has your corporation coordinated investments in education with future workforce needs? As a global research & development company, it is of course in our best interest to support STEM education that helps to train the next generation of scientists and engineers. But we also recognize that STEM doesn’t only mean preparing students to work in a laboratory. Every success we have at Battelle takes a team of professionals, from scientists to lawyers to administrative staff to marketers. Battelle’s commitment to STEM is about preparing students for college and a career by giving them the tools to succeed no matter the field.

What is the key to smart STEM investments? I don’t think there is any one silver bullet, but we have found at Battelle that a focus on scale is incredibly important. We know there are hundreds, even thousands, of high-quality STEM programs and projects going on all over the country. But if they reach only a handful of students, they won’t have the broad-based impact we need to create lasting change. Identity scalable STEM opportunities, initiatives that are already working across regions or states, and invest in those. Be deliberate and thoughtful at the outset. It may take more time at the beginning, but the result will be well-worth it.

What is the STEM initiative that your company has supported are you most proud? I’m proud of our entire STEM portfolio, but if I had to pick just one thing it would have to be the place where Battelle’s STEM education work really began, and that continues to inspire us: Metro Early College High School. Metro calls itself a small school with a big footprint, and it has more than lived up to its billing. An Ohio public STEM school where students of every background receive an education that allows them to excel, Metro has a 100% graduation rate and 100% college admission. And every year the school hosts hundreds of visitors looking to replicate or learn from the Metro model—that’s truly a mark of just how well Metro executes its wonderful mission.

What is your advice on using private-public partnerships to tackle our most pressing education challenges in STEM? Our greatest successes in STEM are the result of public-private partnerships. Metro Early College High School began as a partnership between Battelle, The Ohio State University, sixteen school districts and several non-profit organizations. The Ohio STEM Learning Network, today a vibrant community that impacts close to 20,000 students across Ohio, grew out of collaboration with the state of Ohio and the Bill and Melinda Gates Foundation. We find these cross-sector partnerships in nearly every state that’s a part of the STEMx network—they leverage each partner’s expertise for the most impactful result.

How is your company connecting diversity initiatives with STEM initiatives? Is this a part of your comprehensive strategy? It is something we are increasingly focused on. Fostering an inclusive environment is critically important to Battelle, and we do this both by supporting diversity initiatives internally and by investing in programs that help to grow a diverse STEM workforce. At its core, our STEM education strategy is about increasing the number of STEM learners from every background and walk of life. We support STEM programs that promote access to higher education, and create opportunities for students to interact and learn from STEM professionals. For example, at the Battelle Eastern Technology Center in Aberdeen, Maryland, our Women’s Network recently held a meet and greet with local women in STEM fields and young women attending a local high school. The feedback we received was extremely positive. The high school women were exposed to the many ways they could engage with STEM in the workforce, helping them to see themselves in a STEM career.

Jeffrey Wadsworth has been President and CEO of Battelle Memorial Institute since January 2009. He has worked at Stanford University’s Lockheed Missiles and Space Company and Lawrence Livermore National Laboratory. In 2002, he joined Battelle and served as a member of the White House Transition Planning Office for the U.S. Department of Commerce and Energy. Jeff was appointed director of Oak Ridge National Laboratory, the Department of Energy’s largest multipurpose science laboratory. Wadsworth studied metallurgy at Sheffield University in England, where he earned a bachelor’s degree and a Ph.D. He was also awarded a Doctor of Metallurgy and the highest recognition conferred by the university, an honorary Doctor of Engineering degree. In 2012, Wadsworth, a member of the National Academy of Engineering, was elected to its Chinese Academy of Engineering.
Robert L. Parkinson
Chairman and Chief Executive Officer
Baxter International Inc.

Prior to joining Baxter in April 2004, Parkinson was dean of Loyola University Chicago’s School of Business Administration and Graduate School of Business. Previously, he had a distinguished 25-year career at Abbott Laboratories, serving in a variety of domestic and international management and leadership positions.

Parkinson joined Abbott in 1976 and held a number of marketing and management positions there before being named vice president of European operations in 1990, president of the chemical and agricultural division in 1993 and president of the international division responsible for pharmaceutical, hospital and nutritional products in 1995.

In 1998 he became a member of its board of directors and was elected chairman of the company in 1999. He retired from Abbott in 2001.

Parkinson’s personal commitment to education and life-long learning has been evident throughout his career and involvement in various organizations. Most recently, Parkinson was instrumental in the 2008 establishment of Baxter’s Science@Work: Expanding Minds with Real-World Science education initiative—a multi-year commitment to the Chicago Public Schools to support teacher training and student development in healthcare and biotechnology. He currently serves on Loyola University Chicago’s Board of Trustees, is chairman of the board of Junior Achievement of Chicago and serves on the board of FIRST (For Inspiration and Recognition of Science and Technology).

Parkinson also serves on the board of directors for Chicago-based Northwestern Memorial HealthCare and as chairman of the board of Northwestern Lake Forest Hospital. He is past chairman of the Executives’ Club of Chicago.

Parkinson earned both a bachelor’s degree and a master’s degree in business administration from Loyola University Chicago.

Baxter International Inc., through its subsidiaries, develops, manufactures and markets products that save and sustain the lives of people with hemophilia, immune disorders, infectious diseases, kidney disease, trauma, and other chronic and acute medical conditions. As a global, diversified healthcare company, Baxter applies a unique combination of expertise in medical devices, pharmaceuticals and biotechnology to create products that advance patient care worldwide.

Why do you believe STEM Education/workforce development is critical to our nation’s future?

Innovation is such an important part of our national fabric that, over the past 250 years, it has made America what it is today. Innovation is the grease that makes America’s free enterprise system operate so effectively and become a model to the world. And no place has innovation played such a role as in the tens of millions of people throughout the world, than in healthcare—especially innovation that has originated from the United States.

As a healthcare company, we believe that STEM education and work force development initiatives that inspire youth to seek out careers that stimulate innovation and advance patient care are critical to our business and to public health.

As the nation’s healthcare needs increase, we need to ensure that all students have every opportunity to learn and be inspired by math and science. For example, Latinos are the largest and fastest-growing minority population in the United States, expected to triple by the year 2050 to constitute more than a quarter of the total U.S. population, according to projections from the Pew Research Center. However, Latinos are underrepresented in healthcare careers, with 3 percent of nurses, 3.4 percent of pharmacists, 3.8 percent of physicians and 5.3 percent of physician assistants of Latino descent according to the 2010 U.S. Census and the Health Resources & Services Administration.

How do you believe STEM education can improve a nation’s competitiveness?

Education is the most important issue in our society. We must support STEM education, particularly in math and science, at both the primary and secondary education level if we wish to sustain our track record of innovation. As a science- and technology-based healthcare company, Baxter has a responsibility to help provide current students as well as future generations with opportunities to thrive in these areas.

In the biotechnology sector, for instance, the U.S. outpaces every country in the world in overall innovation, market capitalization, efficiency, patents, funding for neglected diseases and approved bioterapies. According to the World Intellectual Property Organization, the U.S. files more than twice as many chemistry, biotechnology and pharmaceutical patents as other countries combined. The U.S. also has more than half of the Nobel Prizes in Physics, Physiology and Medicine, and Chemistry—more than 88 U.S.-based prize winners in the last 20 years, compared with just 52 from all other nations.

What is the STEM initiative that your company has supported are you most proud?

Baxter’s Science@Work: Expanding Minds with Real-World Science Program is a multi-year commitment with Chicago Public Schools (CPS) to support teacher training and student development in healthcare and biotechnology. Since 2008, Science@Work-sponsored initiatives reached more than 60,000 students and 720 teachers, representing 45 percent of the 148 high schools throughout the district. More than 450 Baxter volunteers supported 85 real-world events for teachers and students, including several opportunities for students to experience science first-hand through interactions with Baxter professionals. Additionally, Baxter is a founding member of FIRST® Robotics and has participated in its engineering competition since 1986, and Baxter employees worldwide have taught students the fundamentals of the free market and entrepreneurism through Junior Achievement.

What do we need in the US to continue to be at the top of global innovation?

There are a number of constraints that exist, or are emerging, that will impact the pace of innovation going forward and every country in the world is struggling to find the right mechanisms to manage these constraints. Sustaining our culture of innovation in the U.S.—especially in healthcare—will require increased collaboration between the private and public sectors. It will require the courage for us, as a country, to deal with the most important underlying social issue of advancing the quality of our education system at all levels.

What counsel would you provide around “collaboration to achieve success” in STEM Education and work force development?

According to the 2011 Nation’s Report Card, only 35 percent of eighth-graders perform at or above proficiency for their grade level in math and 32 percent of eighth-graders perform on par for their grade level in science. Advancing elementary and high school math and science education today sets the foundation for biotech discoveries for years to come. The schools can’t do this alone: collaboration will be critical.

Corporations today—particularly global corporations—have a much greater role to play, and a greater responsibility than ever before, to help ensure a sustainable world. Social concerns such as education are too big for any individual, private organization or single company to tackle. We all must share responsibility—academia, corporations, governments, foundations and NGOs—and work together to find and implement practical solutions. Collaborations among sectors are most advantageous when the partners bring different, yet complementary, expertise and resources together. For example, the corporate sector often brings expertise and resources in management, planning and implementation to a collaboration, while the nonprofit sector often brings deep knowledge and long-standing commitment to a social concern.
Philip Blake
Senior Bayer Representative USA
Bayer Corporation

Science is at the heart of everything Bayer does. It’s the thread that connects Bayer HealthCare, Bayer CropScience and Bayer MaterialScience. Not only is scientific literacy and a highly-trained STEM (science, technology, engineering and mathematics) workforce essential to Bayer’s business, it’s critical to America’s future economic success. Thus, Bayer recognizes its responsibility to help improve science education and ensure that all individuals are scientifically literate. This recognition is central to the mission of the company’s Presidential award-winning Making Science Make Sense® initiative that advances science literacy across the United States using a three-pillar approach of hands-on, inquiry-based science learning, employee volunteerism and public education and awareness.

Why Bayer’s strong commitment? It stems from the fact that new technologies and concepts and increasing global market competition will continue to demand a U.S. workforce that is flexible, scientifically literate and equipped with the critical thinking, problem solving and decision making skills perceived by a quality science education. The U.S. particularly is an attractive market for science because it rewards innovation.

How do you believe STEM education can improve a nation’s competitiveness?
Innovation, invention and discovery are engines that drive U.S. competitiveness, quality of life and national security. These engines, in turn, are driven by the scientific and technological advances made possible by the nation’s STEM workforce. In fact, in 1987, economist Robert Solow won a Nobel Prize for demonstrating this very fact.

To remain competitive, the U.S., its STEM industries and communities must have access to a vibrant pool of diverse STEM workers who are well-trained, highly-skilled and with a strong understanding of the scientific and technological advances made possible by the nation’s STEM workforce. In this, Bayer is committed to improving U.S. STEM education for all students, particularly girls and underrepresented minorities (URMs) including African-Americans, Hispanics and American Indians. For Bayer, that is what the MSM program is all about.

How do you encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?
In a recent Bayer Facts of Science Education survey of female and URMs chemists and chemical engineers, we asked a very similar question. They said students having access to mentors and role models is key. It is critical for young people to see people who look like them doing STEM work—and doing it successfully. The surveyed chemists and chemical engineers also had some good advice for today’s female and URM STEM students, including setting high standards, working hard and never giving up on themselves; developing self-confidence and not letting anyone tell them that they can’t do something; taking advantage of peer net-works and support groups; and, being assertive and taking the initiative to seek out STEM opportunities, internships and scholarships.

How has your corporation coordinated investments in education with future workforce needs?
For a science-based company like Bayer, access to a well-educated, highly-skilled workforce is essential to our success. Over the last 20 years, Bayer and its philanthropic arm, Bayer USA Foundation, have worked together to strategically align investments and create long-term, sustainable partnerships. These partnerships have resulted in nationally-recognized “school to career” programs that are helping the company meet its own current and future workforce needs, while also developing the overall STEM workforce to the benefit of the larger community.

One example is Biotech Partners (BP), founded in 1993 by Bayer HealthCare LLC and the City of Berkeley. BP provides a comprehensive, hands-on academic and job-training biotech program in Berkeley and Oakland public schools for populations typically underrepresented in the sciences. To date, BP has placed nearly 900 youth in internships and co-op work positions at Bayer, as well as Novartis AG, Joint Genome Institute/U.S. Dept. of Energy, Lawrence Berkeley National Laboratory, U.S. Dept. of Agriculture and Kaiser Permanente Medical Center.

What is the STEM initiative that your company has supported are you most proud?
Of all the various MSM initiatives Bayer undertakes, one of the things I am most proud of is the longstanding commitment of our employee volunteers—now more than 1,000 strong. They are the backbone of MSM. Their contributions to society and to science literacy are a mark of pride and honor for me, for Bayer as a company, and for the country at large.

How is your company connecting diversity initiatives with STEM initiatives? Is this part of your comprehensive strategy?
Through the MSMs program, Bayer eaily connects its work in STEM education and workforce development with its overarching commitment to diversity and inclusion—an integral part of our company values. For example, in the last few years, Bayer has undertaken a series of STEM education diversity initiatives including hosting national STEM education diversity forums in Washington, D.C. and San Francisco. We’ve also commissioned several Bayer Facts of Science Education surveys to examine diversity and underrepresentation issues from the perspec-tive of industry leaders, parents, the underrepresen-ted scientists and engineers, themselves, and STEM department chairs of the country’s top 200 research institutions.

In addition, in order to further galvanize STEM industry involvement, Bayer has designated and made widely available a series of resource guides with the goal of facilitating new business-education partnerships that help scale up best practice K-12 STEM education programs that have proven track-record of helping students, especially girls and URMs, to achieve and succeed in STEM.

Philip Blake was named Senior Bayer Representative USA, Senior Bayer HealthCare Representative USA and president of Bayer Corporation in July 2012 and as such is the ranking Bayer executive in the country, following Bayer’s global leadership protocol. He is responsible for the U.S. activities of the Bayer Group, an international health care, nutrition and high-tech materials group based in Germany.

In his role, Mr. Blake champions the company’s corporate social responsibility activities, including its U.S. Presidential award-winning Making Science Make Sense® program. For nearly 20 years, the program has advanced science literacy across the country through the support of hands-on, inquiry-based science learning, a corps of more than 1,000 employee volunteers and a national public education and awareness campaign led by America’s first female African-American astronaut Dr. Mae Jemison.

Previously, Mr. Blake served as President & CEO, Bayer Inc. and Head of Bayer HealthCare in Canada.

In his 30-year career with Bayer, Mr. Blake has held leadership positions around the world focusing on global strategic product marketing, business development, clinical planning, product development and sales management.

Mr. Blake obtained his degree at Bristol University and undertook further executive training at the Open University, INSEAD and Wharton Business School. He is a Chartered Corporate Director—earning this designation in 2006 from the Directors College at the DeGroote School of Business, McMaster University.
Dr. Ralph W. Shrader
Chairman, Chief Executive Officer, and President
Booz Allen Hamilton Inc.

Booz Allen Hamilton has been at the forefront of strategy and technology consulting for nearly a century. Today, the firm provides services primarily to the US government in defense, intelligence, and civil markets, and to major corporations, institutions, and not-for-profit organizations. Booz Allen often clients deep functional knowledge, spanning strategy and organization, engineering and operations, technology, and analytics—which it combines with specialized expertise in clients’ mission and domain areas to help solve their toughest problems.

Booz Allen is headquartered in McLean, Virginia, employs approximately 26,000 people, and had revenue of $5.86 billion for the 12 months ended March 31, 2012. To learn more, visit www.boozallen.com. (NYSE: BAH)

Dr. Ralph W. Shrader is Chairman, Chief Executive Officer, and President of Booz Allen Hamilton Inc., the leading strategy and technology consulting firm. He is the seventh Chairman since the firm’s founding in 1914, and has led Booz Allen through a significant period of growth and strategic realignment.

Dr. Shrader’s leadership philosophy and professional experience mirrors Booz Allen’s mission—combining strategy with technology to deliver enduring results to clients. His personal consulting practice has centered on the global communications industry. He has led major assignments for telecommunication companies in the United States, Europe, and Asia.

Dr. Shrader is active in professional and charitable organizations. He is past Chairman of the Board of the 40,000-member Armed Forces Communications and Electronics Association (AFCEA), serves on the Board of ServiceSource, the largest community rehabilitative program in Virginia, and is past Chairman of the Board of The Neediest Kids, Inc. charity. As Chairman of AFCEA International, he led efforts to improve opportunities for women and minorities in the communications and electronics fields.

Dr. Shrader received his B.S. degree in electrical engineering from the University of Pennsylvania, and his M.S. and Ph.D. degrees in electrical engineering, with minors in mathematics and nuclear physics, from the University of Illinois.

Why do you believe STEM Education/workforce development are critical to our nation’s future?
The STEM disciplines of science, technology, engineering, and math hold the key to unlocking innovative solutions to our most pressing challenges, such as those related to healthcare delivery, energy supply, and cybersecurity, just to name a few. It’s important to reach and inspire young people while they are still forming visions of their futures, at a time when we can still influence their career trajectories. And, we shouldn’t overlook investing in STEM workforce development programs for adults seeking career changes and advancement, including our nation’s veterans transitioning into the civilian workforce.

What is the key to smart STEM investments?
Investing in STEM education is a natural component of Booz Allen’s philanthropic activities. We encourage employees to get actively involved in their communities, work with and support their efforts with company financial contributions. Our support for STEM programs lies at the intersection of employee involvement and business priorities.

I consider a smart corporate investment in STEM to be one that aligns the social need with a corporation’s core competency or asset. Booz Allen Hamilton provides consulting, technology, and engineering services to government and industry. Our people—and their knowledge—are our most valuable assets. We smartly invest in programs that encourage and enable Booz Allen employees to share their knowledge with others. An example of this is our youth mentoring initiative we’re calling TIME TO INSPIRE™.

We encourage staff to get involved in carefully selected volunteer programs that apply science and technology in innovative ways to facilitate learning. One of the profiled programs, Safe and Secure Online, connects cybersecurity professionals to middle school students, and teaches them how to keep themselves, their identities, and their IT equipment safe. While volunteering, professionals are introducing young people to the idea of a career in cybersecurity. We’ve created a “win” not only for the kids and the community, but also for our employees who enjoy sharing their expertise, and for our business, because more people become familiar with Booz Allen’s cybersecurity expertise.

What is the STEM initiative that your company has supported are you most proud of?
I’m especially proud of our relationship with FIRST®, which we’ve supported since 2009, because it draws on the passion of our employees for problem-solving and mentoring. We help match employees with FIRST teams in their communities. When a Booz Allen employee serves as a team coach and mentor, the team becomes eligible for a grant toward participation in FIRST competitions. We also underwrite FIRST regional competitions in several cities, and encourage employees to serve as competition judges and volunteers.

We’ve been impressed with the way FIRST promotes and teaches teamwork, problem solving, and collaboration. These are important skills for Booz Allen consultants, and we believe that through FIRST, students are building the right kind of skill set for the future, for our firm, and for the country. Our STEM professionals mentoring teams are, through the act of teaching, others, applying and growing their own professional skills.

How is your company connecting diversity initiatives with STEM initiatives? Is this a part of your comprehensive strategy?
Booz Allen’s diversity and inclusion initiatives include efforts to cultivate STEM interests and skills in populations that are underrepresented in the STEM workforce, and to support the growth and success of these professionals when they join our workforce. We do this through strategic partnerships with educational institutions, professional associations, and community organizations. The Society of Women Engineers, Society for Hispanic Professional Engineers (SHPE), Women of Color in Technology, and Thurgood Marshall College Fund are just a few of the organizations we have supported.

“It’s important to reach and inspire young people while they are still forming visions of their futures, at a time when we can still influence their career trajectories.”
Scott McGregor serves as President and Chief Executive Officer of Broadcom Corporation. In this role, he is responsible for guiding the vision and direction for the company’s growth strategy. Since joining Broadcom in 2005, the company has expanded from $2.40 billion in revenue and 3,250 employees to $8.01 billion in 2012 revenue and 11,050 employees. In addition, Broadcom’s geographic footprint has grown from 13 countries in 2005 to 24 and its patent portfolio has expanded from 4,800 to 3,250 employees to $8.01 billion in 2012 revenue and 11,050 employees.

Mr. McGregor received a B.A. in Psychology and a M.S. in Computer Science and Computer Engineering from Stanford University. He served on the board of Ingram Micro, on the Engineering Advisory Council for Stanford University and also is President of the Broadcom Foundation.

What do we need in the US to continue to be at the top of global innovation? Unlike any other nation in the world, the United States’ systems of governance, education and business historically rewards innovation—this is our greatest advantage as a competitor in a global economy. Each of these sectors need to re-dedicate their efforts to create a trained STEM workforce at all levels—from traditional trades to sophisticated science, engineering and technology professions.

What traits do corporate leaders need to effectively support and advance STEM education today? At Broadcom, we understand our future success depends not only on industry-leading innovations, but on our commitment to being a responsible global citizen who produces products that help to improve the quality of life for future generations.

As a global firm focused on innovation, we recognize our unique role in making a positive impact to support STEM subjects, especially engineering and applied mathematics which have an impact on almost all industries. As part of Broadcom’s corporate social responsibility (CSR) mandate, we established the Broadcom Foundation to foster interest in STEM and to demonstrate these areas to students as rewarding career paths. This stewardship is an essential component of cultivating innovation and an attitude of responsibility for our global future, culminating in the prestigious Broadcom MASTERS® competition that recognizes the best and brightest middle school students in the country.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities? Students can be encouraged to continue studying STEM subjects by more mentorship programs with positive role models demonstrating how a career in STEM subjects, especially engineering and technology, is essential to advancing STEM education.

In addition to the Broadcom MASTERS competition, we leveraged our experience to reach underserved students through a pilot partnership Broadcom forged between the California After School Network (CAN) and five regional science and engineering fairs to create “Broadcom MASTERS Jr. Vanity”. In this community outreach project, after-school program administrators and middle school teachers in Sacramento, San Diego, Alameda, Santa Clara and Orange County, Calif., were trained in the scientific method and engineering process in order to get teams of underprivileged middle school students “science fair ready” in a period of six weeks.

Scott McGregor
President and Chief Executive Officer
Broadcom Corporation

Broadcom Corporation (NASDAQ: BRCM), a FORTUNE 500® company, is a global leader and innovator in semiconductor solutions for wired and wireless communications. Broadcom® products seamlessly deliver voice, video, data and multimedia connectivity in the home, office and mobile environments. With the industry’s broadest portfolio of state-of-the-art system-on-a-chip and embedded software solutions, Broadcom is changing the world by Connecting everything®.
Mike Gregoire is CEO and a member of the Board of Directors of CA Technologies, one of the world’s largest information technology management software companies. He joined the company in 2013 after nearly 25 years in the industry.

Gregoire has a master’s degree from California Coast University and a Bachelor of Science in physics from Wilfrid Laurier University. He sits on the board of ShoreTel and is Chair of the Compensation Committee.

CA Technologies is involved with several STEM initiatives, including:

- **100Kin10**: Organization’s efforts include addressing the shortage of STEM teachers and improving STEM learning for young people.
- **Anita Borg Institute for Women and Technology**: Supporting programs to help recruit, retain and develop women technology leaders.
- **Boys & Girls Clubs of America**: $2 million commitment to launch Tech Girls Rock, an initiative that aims to inspire girls to discover an interest in technology.
- **Change the Equation**: Working with members of the business community to improve STEM learning.
- **Citizen Schools**: Supporting STEM education initiatives in the organization’s Massachusetts chapter.
- **Clinton Global Initiative**: Part of CGI’s STEM education working group.
- **DonorsChoose.org**: Supporting STEM education projects in underserved schools.
- **NPower**: Supporting the organization’s technology training efforts for low-income young people.
- **PENCIL**: $12 million commitment to launch Wired for Success, an initiative to help build capacity for STEM education in public schools.
- **Sesame Workshop**: $1 million commitment to assist with the development of an online STEM Hub with educational resources for preschoolers.
- **Year Up**: Supporting technology apprenticeships in Chicago, New York City, San Francisco and Washington D.C.

Why do you believe STEM Education/workforce development is critical to our nation’s future? I personally believe that today, where there are enough challenges to discourage even the most creative, talented and driven of the world’s youth, businesses can and should help young people realize their untapped potential. It’s important for companies like ours to be looking toward the future and encouraging the next generation of business leaders, particularly in the area of STEM.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities? We can encourage young people to continue their study of STEM subjects by exposing them to the educational and career opportunities in these areas. Many students, whether they’re young women or underrepresented minorities, don’t know what’s out there, or what they need to do to get there, especially those without mentors or contacts to get their foot in the door. Through our work with organizations like Year Up, NPower and PENCIL, and our Tech Girls Rock initiative with Boys & Girls Clubs of America, we hope to change that and help level the playing field.

What area of STEM are you most passionate about? As a software company, technology is obviously the area of STEM we are most passionate about, but science, technology, engineering and math are inter-connected subjects that are equally important. For example, I studied physics in college, a natural science that involves the study of matter and energy. But everything I learned helped lead me to where I am today and laid the foundation for a career in technology.

What is the STEM initiative that your company has supported and are you most proud? CA Technologies made a $2,000,000 commitment to Boys & Girls Clubs of America (BGCA) to launch Tech Girls Rock, an initiative that aims to inspire tween and teen girls to discover an interest in technology and tech-related educational opportunities and careers. Since the program kicked off, CA Technologies employees have led workshops throughout the country in locations including Bellevue, WA; Boston, MA; Chicago, IL; Lai Vegas, NV; New York, NY; Plano, TX; San Francisco, CA; Scottsdale, AZ; and Tampa, FL. Workshops include a career exploration panel, where CA Technologies employees share personal stories about their jobs within the technology sector and the rewards of being in this field. They also help lead team-based challenges and projects throughout the day, which provide hands-on technology experience. Additionally, club members are being measured by pre and post attitudinal surveys at each workshop to demonstrate whether there is a positive shift toward interest in tech-related educational opportunities and careers. A post-event survey indicated a 42 percent increase in interest in tech-related careers and a 37 percent increase in tech-related educational opportunities.

The initiative has garnered positive attention, including being highlighted at the Clinton Global Initiative Annual meeting. Mayor Rahm Emanuel also proclaimed Tech Girls Rock Day in Chicago and New York City Mayor Michael Bloomberg applauded the young women who embraced the opportunity to further develop their technology knowledge and skills through Tech Girls Rock workshops.

How can we advance mentorships and apprenticeships in the STEM pipeline? Sharing best practices about STEM-related partnerships and programs is key to helping grow mentorships and apprenticeships in the STEM pipeline. For example, our involvement with Year Up’s apprenticeship program came about through an introduction from JPMorgan Chase. Similarly, through our work with organizations like 100Kin10 and the Clinton Global Initiative, and involvement in events like the White House Tech Inclusion Summit, we are able to learn how other businesses are supporting this area, and collaborate to make an even bigger impact.

What is your advice to those involved in promoting STEM education? It’s important to start early and encourage kids to get interested in it. We need to make tech cool and let these young caregivers, who are part of a generation defined and enabled by technology, know there is a place for them in this field. I’m lucky to get to do this as part of my job, but I encourage everyone to do what they can to play a role in helping young people realize their untapped potential.
Richard D. Fairbank
Founder, Chairman and Chief Executive Officer
Capital One Financial Corporation

Capital One is a Fortune 200 company that offers a broad spectrum of financial products and services for consumers, small businesses and commercial clients. As a leading financial institution, the success of our business relies on a healthy economy with a skilled 21st century workforce. Across our business practices and philanthropic investments, we support STEM programs and partnerships that span K-12 education to workforce development through partners such as the National Academy Foundation, colleges and universities across the country, and workforce skills training organizations. We also work to incorporate the development of STEM skills into our other education and financial literacy philanthropic programs.

Why do you believe STEM Education/workforce development are critical to our nation’s future?

To understand the importance of STEM, just look at the world around us, and think about the mobile computing power we hold in the palm of our hand. All roads lead to harnessing the power of science, technology, engineering, and math across virtually every industry—from financial services, to manufacturing, to health care, to technology. STEM will drive transformation across the board.

The impact of STEM is on display every day as we watch industries being disrupted by digital businesses, the use of data and analytics, and new technologies. Almost a quarter of a century ago, I believed that financial services would begin to consolidate nationally one product at time and that the combination of data, technology, and testing would change the game in banking. Our company was founded on these fundamental beliefs, and we remain relentlessly focused on STEM to run our business and create a competitive advantage. The role of STEM has been amplified with the emergence of digital business models that require an even greater emphasis on STEM and an abundance of great talent with STEM skills.

How do you encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

STEM programs must help students make the connection between academic study and real-world opportunities. We need to help students see that science, technology engineering and math are the gateway to new, breakthrough ideas. We also need to have diverse beacons in STEM who can serve as mentors and champions to excite as many students as possible to pursue STEM-related education.

We also need to ensure that STEM programs are interesting, relevant and accessible. We support a wide range of partnerships and programs to help bring STEM classes to students during critical time periods in their education. For example, we support the National Academy Foundation (NAF) in providing curriculum in areas such as finance, IT and engineering for charter high schools. More than 50,000 students have attended one of NAF’s 500 schools, two-thirds of whom are minorities. They have achieved a 90% graduation rate, an 85% college attendance rate, and a 17% earnings increase over their non-Academy peers.

How has your corporation coordinated investments in education with future workforce needs?

For more than 15 years, we have made STEM investments across a broad range of programs to help people at each stage of their lives—from elementary school through adulthood. We also work with colleges and universities to help students develop skills in statistical analysis that are critical needs in today’s world of big data and rapidly advancing technology. For example, we led a data competition with more than a half a dozen schools for students in statistics, economics, computer science and life sciences, challenging students to create real-world solutions using STEM-based principles and practices, innovative thinking and entrepreneurial skills. These programs serve as a launching pad for their STEM- and finance-based professional opportunities. We also are beginning to launch outreach efforts through our Digital Labs in Arlington, VA, San Francisco and New York to share information with those interested in mobile development, technology and innovation.

What is your advice on using private-public partnerships to tackle our most pressing education challenges in STEM?

Everyone—our communities, our families, our citizens, our customers, and our businesses—have a huge stake in STEM education. STEM will be the backbone for future innovation and economic growth. Accelerating our journey to improve STEM education has some big challenges, but also big opportunities. Private businesses bring incredible know-how to the table about the application of STEM in the marketplace. Public institutions are driving policies, technologies, and research that will shape the evolution of STEM. Together, we can fashion coherent frameworks to encourage and reward advances in STEM education and make STEM a centerpiece of our agenda.
George S. Barrett
Chairman and Chief Executive Officer
Cardinal Health

Cardinal Health is a Fortune 21 company that improves the cost-effectiveness of health care. As the business behind health care, Cardinal Health helps pharmacies, hospitals and ambulatory care sites focus on patient care while reducing costs, improving efficiency and quality, and increasing profitability. Cardinal Health employs more than 30,000 people worldwide.

George S. Barrett is chairman and chief executive officer of Cardinal Health, a company ranked number 21 on the Fortune 500 and dedicated to improving the cost-effectiveness of health care.

Barrett has refocused Cardinal Health on its essential role to support hospitals, pharmacies and alternative sites of care in their efforts to improve the quality and safety of patient care, while reducing costs and improving efficiency. The tagline—Essential to care—embodies the company’s strategy and the culture, which views its position in the evolving healthcare system as both a privilege and a responsibility.

Barrett joined Cardinal Health in 2008 as vice chairman and CEO of the company’s Healthcare Supply Chain Services segment, where he was responsible for all of the company’s supply chain businesses, including pharmaceutical, medical/surgical, distribution, nuclear pharmacy services, Presource® surgical kitting services and the Medicine Shoppe International, Inc. retail pharmacy franchise operations.

From 2005 through 2007, Barrett served as president and CEO of Teva Pharmaceutical Industries in North America and as corporate executive vice president for Global Pharmaceutical Markets. He held the position of president of Teva USA from 1999 to 2004. Prior to joining Teva, Barrett held various positions with Alpharma Inc., serving as president of US Pharmaceuticals from 1994 to 1997, and president of NMC Laboratories, prior to its acquisition by Alpharma in 1990.

Barrett serves on the boards of directors of Eaton Corporation and Nationwide Children’s Hospital. He is a member of the boards of trustees of the Healthcare Leadership Council and The Conference Board. He is also a member of the President’s Leadership Council of Brown University, Business Roundtable, The Business Council, Ohio Business Roundtable and The Columbus Partnership.

How do you believe STEM education can improve a nation’s competitiveness?

This is truly a global market in a technologically-driven world that is changing at light speed—the likes of which has never been seen before. And, the competition is getting tougher by the day. Countries are vying for the most talented people who can help them be competitive not only in the work place, but to contribute to the broader economy and their communities, as well. To compete successfully, our country must provide a well-rounded education that is deep-seated in STEM, yes, but also includes language arts, history, athletics and the arts.

How do you encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

It all begins with family. Our children need our support and encouragement every step of the way, helping them to reach their potential and achieve their dreams. It also takes highly skilled, dedicated and inspirational teachers of STEM subjects to continually encourage and motivate our children. In our not-too-distant past, STEM subjects were typically geared toward boys—not anymore. We need to assure all students can contribute in a meaningful way, which means women and minorities must have an equal opportunity to learn, grow and succeed in these high-demand areas. They just need the resources, encouragement and vision to see them through.

At Cardinal Health, we do many things to encourage women and minorities, including our Employee Resource Groups (ERGs) that are focused on workforce development. Some of these groups include the African American ERG, Hispanic Americans, Disability Advocates, Veterans and a Women’s Initiative Network.

What do corporations need to do to create more STEM opportunities and fill existing jobs?

Corporations can play a critical role to extend learning in the classroom by partnering with schools to offer internships and/or internships. At Cardinal Health, we offer mentorships, internships in functional areas (including IT, finance, accounting and treasury), leadership development programs and a Women in Pharmacy initiative.

While women make up two-thirds of applicants to pharmacy schools and more than 60 percent of graduates, they represent only a fraction of community pharmacy owners in the U.S. Meanwhile, a growing population of male independent pharmacy owners is reaching retirement age. The goal of the Women in Pharmacy Initiative is to engage and educate women on the benefits of ownership in the retail independent space.

Of course, learning is a lifelong process. At Cardinal Health, we offer Continuing Education (CE) classes for pharmacists and other health profession- als through conferences and workshops at regional and national meetings.

What do we need in the U.S. to continue to be at the top of global innovation?

To be at the top of global innovation, we need to start early in our children’s lives by assuring high quality early learning experiences are available for all, by supporting parents in their critical role as the child’s first teacher, and by providing life experiences for students through mentoring and internships.

In addition, corporations can do their part by inspiring innovation in their employees. We do that in many different ways at Cardinal Health, but one new initiative offers cash prizes for the top five innovative ideas presented to our leaders. Not only is this a fun experience for all involved, but selected employees gain recognition for their ideas, earn cash and one grand prize winner sees his/her idea become a reality for Cardinal Health—ultimately benefitting our bottom line, helping us become more competitive in the marketplace and making us more attractive to potential recruits.

What is your advice on using private-public partnerships to tackle our most pressing education challenges in STEM?

There is an extremely pressing challenge in STEM education and education in general in Columbus—the home of Cardinal Health corporate headquarters. Because many of our children are not acquiring the skills they need to succeed in school, in college or work, George Barrett is co-leading the mayor’s Columbus Education Commission’s efforts to help Columbus City school children succeed. The goal of this new public-private partnership is to ensure Columbus City Schools provide the best education from preschool through career and:

1. Enable all of our children to succeed in the city’s vibrant, growing economy.
2. Make Columbus a global leader in developing the highly-skilled, creative entrepreneurial workforce that will propel economic growth in the 21st Century.
3. Leverage the resourcefulness of our entire community to meet these goals.

By bringing together educators, government, corporations, parents and the community to look at all aspects of education, together we will assure better student outcomes.
Greg Page serves as chairman and chief executive officer of Cargill. He was elected chairman of the board on Sept. 11, 2007, and CEO on June 1, 2007. He was elected to the Cargill Board of Directors in August 2000.

Page joined Cargill in 1974 as a trainee assigned to the Feed Division. Over the years, he held a number of positions in the United States and Singapore. Page worked with the start-up of a poultry processing operation in Thailand, the beef and pork processing operations of Cargill’s Excel subsidiary in Wichita, Kansas, and the Financial Markets Group in Minneapolis.

Page serves as a member of the board of directors of Eaton Corporation and Carlson. He chairs the Tuscarora Higher Education Taskforce, providing thought leadership in a public-private partnership to align Minnesota’s workforce needs with higher education. He is immediate past-chair of the board of Big Brothers Big Sisters of America and continues to serve on this board. He is a member of the board of the Northern Star Council of the Boy Scouts of America.

Page received a bachelor’s degree in economics from the University of North Dakota. He was born in Bottineau, N.D.

How has your corporation coordinated investments in education with future workforce needs?

Cargill is actively involved in efforts with university systems to better align their programming with future workforce needs and that encourage talented students to enter these fields. Cargill has invested significantly in the STEM education through its philanthropic agenda. The idea is to help build a workforce pipeline. If we are going to meet future workforce needs in STEM, we have to work on increasing the pool of talent in that area today, rather than compete for a diminishing pool of candidates.

We are investing in STEM in other countries where our business is growing, as well. Some months ago we made a commitment to Brazilian President Dilma Rousseff to participate in Brazil’s Science Without Borders program and hire Brazilian college interns to work in R&D and plant operations.

What area of STEM are you most passionate about?

We believe diversity and inclusion is a source of strength for our company and the global community. The focus on STEM education overall is important for our nation’s future, but a specific focus on communities of color and women in STEM is essential for our country. At Cargill, we foster a culture that celebrates differences in our employees, our suppliers and our communities.

What is the STEM initiative that your company has supported that you are most proud of?

Cargill has supported many programs in the K-12 grades to help create the pipeline of students and workforce in STEM fields. I am most proud of Cargill’s multiple partnerships to roll out STEM curricula in those grades. Starting early is important if we are to inspire and motivate young people to pursue future study and careers in STEM.

For example, we support the Engineering is Elementary (EiE) program created by the Museum of Science in Boston to introduce engineering and technological concepts and career paths to children in grades 1 through 5. Cargill has contributed more than $2.6 million to the EiE initiative, which is currently used in all 50 states and nearly 3,000 schools.

Cargill partners with Project Lead the Way (PLTW), which is focused on bringing STEM education to middle and high school students. Cargill supports PLTW’s Gateway to Technology® program, which provides an engineering-focused curriculum to middle school students, and the Pathway to Engineering® program, a four-year high school program taught in conjunction with college preparatory mathematics and science courses.

Cargill and the National 4-H Council have co-created 4-H Science, Engineering and Technology (SET) Clubs, a comprehensive science program engaging more than 600 local youth and Cargill employees in Indiana, Iowa, Kansas, Missouri and Nebraska. In the first year of the partnership, 22 4-H SET clubs were implemented in the five grantee states. From summer food science camps in Kansas to robotics clubs in Missouri and Iowa, these new initiatives have reached more than 628 youth and 118 volunteers. Other types of activities in the 4-H SET Clubs include experiments, hands-on activities, problem-solving and demonstrations. These programs and others like them, which bring the excitement of STEM learning alive and introduce STEM career possibilities to America’s schoolchildren, are vital to building the pipeline of our nation’s next generation of STEM leaders. ■

“Starting early is important if we are to inspire and motivate young people to pursue future study and careers in STEM.”
Caterpillar serves customers in more than 200 countries and territories with a diverse workforce of more than 120,000 people, working in the development, manufacture and sale of products that provide both essential and environmentally conscious solutions. Ongoing investments totaling nearly $6 million in 2012, our STEM-related investments have helped sustain Caterpillar as a leading commercial and military contractor in the United States, and the world’s largest manufacturer of construction and mining equipment. Caterpillar is the world’s leading manufacturer of construction and mining equipment, diesel and natural gas engines, industrial gas turbines and diesel-electric locomotives. For more than 85 years, Caterpillar Inc. has been making sustainable progress possible and driving positive change on every continent. Employees who have a strong foundation in science, technology, engineering and math education are foundational to our success. We invest significantly in STEM programs and initiatives, including memberships in the Society for Women Engineers, the National Society of Black Engineers and the Society for Hispanic Professional Engineers. We sponsor FIRST Robotics and LEGO League teams globally and offer engineering internships and scholarships to give aspiring engineers practical experience. In 2012, our STEM-related investments totaled nearly $6 million.

Doug Oberhelman is chairman and chief executive officer of Caterpillar—the world’s leading manufacturer of construction and mining equipment, diesel and natural gas engines, industrial gas turbines and diesel-electric locomotives. With a workforce of more than 120,000, Caterpillar serves customers in more than 180 countries with more than 300 products. Oberhelman joined Caterpillar in 1975 and has held a variety of positions including Chief Financial Officer and Vice President for Engine Products. He was named Vice Chairman and CEO-Elect in 2009 and led a team that developed Caterpillar’s current strategic plan. Oberhelman became Chairman and CEO in 2010.

He is currently a director for the boards of Eli Lilly and Company, serving on the Audit and Finance Committees, the National Association of Manufacturers, serving as chairman, and the Wetlands America Trust. He is active with The Nature Conservancy serving on the Latin American Conservation Council and on the board of the Illinois Chapter. Oberhelman is also a member of The Business Council and the Business Roundtable where he serves on the Executive Committee and as chair of the International Engagement Committee.

Why do you believe STEM Education/workforce development are critical to our nation’s future?

There is a proven correlation between STEM jobs and GDP growth. A recent report by the National Governors Association noted that STEM occupations are among the highest paying, fastest growing and most influential in driving economic growth and innovation. Individuals employed in STEM fields enjoy low unemployment, prosperity and career flexibility. At Caterpillar, graduates in technical fields have their choice of a number of career opportunities including in product development, manufacturing, supply chain, product support and marketing. Caterpillar dealers are also a source for technical careers, and we support their dealer technician training programs.

Our world is more competitive than ever today. There are more than 100 Chinese companies looking to be the next Caterpillar. And that’s just one country. Caterpillar is competing with these companies not just for customers, but also for talent. We want the best talent in the world working at our global R&D headquarters near Peoria as well as at our design centers around the world. We have to innovate to be competitive and that takes the best people.

How do you believe STEM education can improve a nation’s competitiveness?

The United States once had the highest proportion of college graduates in the world. Today, we are fourth among other developed countries and have remained flat, while other countries have been on a steady upward trajectory. Caterpillar is counting on the next generation of engineers and scientists to meet the world’s needs while preserving the environment for future generations through innovation and collaboration. Technology has dramatically changed CAT products and made them more competitive. Today, our machines are powered as much by software as they are by fuel. The electronics control modules on large Cat mining trucks have more than 500 million lines of software code—about the same computational power as the avionics on a U.S. Air Force fighter jet or a luxury automobile.

Where do you see the biggest area of opportunity in advancing STEM jobs / careers?

Employees in the future will need more math and science understanding to be comfortable with technology as products become more complex—everyone from the technicians who work on Cat products at our dealerships, to the engineers who develop breakthrough technologies to help our customers operate more safely and efficiently. Helping students understand there are good, well-paying jobs with upward mobility that are doing important and interesting work is critical. Giving them a solid math and science foundation and the knowledge that they can make a difference in society will go a long way toward attracting more people into STEM careers.

What do we need in the US to continue to be at the top of global innovation?

In order to compete, we have to innovate, and for that we need engineers and scientists. First we need immigration reform to allow us to recruit top talent from countries who are graduating more science and math students. This will help us address a critical shortage of skills that exist today. Immigrant employees are helping us compete today. And they are an important reason Caterpillar is the global leader in our industry. These employees are filling needed roles and helping us remain productive and competitive and to be the leader we are. Longer term, we need to develop more talent in the U.S. by focusing on collaboration and creative thinking that drives innovation. We must cultivate an environment where innovation is rewarded and can flourish. That will require government and the private sector to work together to fund research and support quality education in science and technology.

How is your company connecting diversity initiatives with STEM initiatives? Is this a part of your comprehensive strategy?

Driving a diverse and inclusive culture is a key part of Caterpillar’s enterprise strategy. We believe a diverse team brings the most innovative solutions. For example, Caterpillar engineers developed, from the ground up, a fully integrated design of our new hybrid hydraulic excavator, which was one of the spotlights of Caterpillar’s exhibit at a recent trade show in Munich, Germany. We encourage our engineers to mentor FIRST robotics and LEGO league teams, and we leverage our employee resource groups to address business problems, such as how we can better meet our customers’ needs in China. Caterpillar joined The National Consortium for Graduate Degrees for Minority Engineers in Engineering and Science (GEM) in 2011. GEM is dedicated to supporting underrepresented groups (African Americans, American Indians, and Hispanic Americans) at the master's and doctoral levels in engineering and science. In July of this year, we will be the proud employer of the President of the Society for Women Engineers. We are leveraging this opportunity to press for greater focus on STEM education.
CH2M HILL

Lee McIntire
Chairman and Chief Executive Officer

Employee-owned CH2M HILL is a global leader in full-service consulting, design, design-build, operations and program management services for public and private clients. With US$7 billion in revenue and 28,000 employees worldwide, the firm delivers innovative, practical, sustainable solutions—helping clients develop and manage infrastructure and facilities that improve efficiency, safety and quality of life.

As one of the world’s largest engineering firms, CH2M HILL is committed to developing and fostering a diverse talent pipeline that will help solve the environmental and engineering challenges of tomorrow. CH2M HILL supports a wide range of STEM programs, including introducing elementary students to basic science and math concepts, sponsoring secondary student science and engineering competitions and providing financial support and hands-on engineering experiences to keep university students engaged. CH2M HILL believes in investing professional expertise, volunteer time and financial resources to support organizations promoting STEM education.

With more than 35 years of international engineering and construction experience, Lee McIntire serves as Chairman and CEO of CH2M HILL, a recognized global leader in consulting, design, design-build, operations and program management for private and public clients. Mr. McIntire’s priorities for the firm represent the highest standards of ethical behavior, safety, quality and a positive client experience. The firm is frequently recognized for its focus on sustainability and workplace satisfaction.

Mr. McIntire’s academic background includes a Bachelor’s degree in Civil Engineering from the University of Nebraska, a Master’s degree from the Thunderbird School of Global Management in Arizona and the Executive Management Program at Dartmouth’s Tuck School of Business.

Mr. McIntire lends his leadership to a number of organizations around the world, many of which provide a platform to emphasize the critical role of STEM education in maintaining American competitiveness, including Business Roundtable; World Economic Forum; World Business Council on Sustainable Development; U.S.-Brazil CEO Forum; National Petroleum Council; Council on Competitiveness; Aspen Institute’s Commission on the Arctic; and the National Academy of Construction. He serves as the Chair of the Infrastructure and Urban Industry Partnership of the World Economic Forum and as a non-executive director on the board of BAE Systems, PLC. In 2011, he was awarded the Woodrow Wilson Award for Corporate Citizenship and, in 2012, received the International Bridge Builders Award from the University of Denver’s Josef Korbel School of International Studies.

How do we encourage students to continue their studies, particularly women and underrepresented minorities?

CH2M HILL recognizes our work doesn’t stop once students have entered the STEM pipeline. We also support programs that keep students engaged throughout their post-secondary education and into the workforce. We provide support to help alleviate the financial burden of college, allowing students to focus on their studies, with 72 percent of our 47 scholarships going to a diversity organization or student.

Research shows engineering has one of the lowest retention rates of college majors, so balancing textbook-heavy courses with real-life application is essential. We’re proud to sponsor Engineers Without Borders, an organization providing hands-on opportunities for engineering students to make a difference by designing and implementing basic infrastructure projects in developing communities. When students experience the humanitarian aspects of engineering and see firsthand how it changes lives, they’re more likely to stay engaged.

Recruiting, advancing and developing female STEM professionals is a core CH2M HILL value. We support programs that open STEM opportunity doors for girls and provide them with female mentors and role models. We have supported the Mentoring A Girl in Construction Camp; Introduce a Girl to Engineering Day; Girls Explooring STEM; the Global Marathon For, By and About Women in Engineering; and the Women’s Transportation Seminar’s Transportation and You program.

We understand the importance of keeping women and minorities engaged in the profession once they enter the workforce, which is why we invest in our Employee Network. These groups provide a support network and professional development. We believe engaging our employees in volunteering is critical to program success—providing more meaningful interactions and role models for students to follow and keep them interested in STEM, as well as providing leadership development and rebuilding opportunities for our employees. We often hear from our volunteers that seeing the kids’ excitement when a concept finally clicks inspires the volunteers and helps them remember why they chose this career in the first place. It’s a double win.

What is the STEM initiative that your company has supported are you most proud?

I’m proud of the spirit of service embedded in our employees who give time to inspire students and lend technical expertise to shape programs to develop tomorrow’s STEM workforce. We have employees serving on School Boards, tutoring students, mentoring competition teams, providing feedback as science fair judges and visiting classrooms to share their passion for engineering. You can’t underestimate the power of grassroots efforts to create a one-on-one interaction with a budding engineering or scientist.

However, we also need to balance that grassroots volunteerism with programs that provide greater leverage and impact. I’m proud that we re-launched the CH2M HILL Foundation earlier this year, with STEM education as a focus. One of the first grants awarded was to Future City, a design-build competition asking students to combine technical skills with creativity and teamwork to create cities of the future.

How is your company connecting diversity initiatives with STEM initiatives? Is this a part of your comprehensive strategy?

As part of our diversity recruitment strategy, outreach to National Diversity Organizations that support STEM initiatives is important. This summer, we’re proud to team with the National Society of Black Engineers and Denver Mayor Michael Hancock’s office to bring the Summer Engineering Experience for Kids program to 300 3rd-5th graders. This program is a great fit for us because of its multiple touch points to our business goals. First and foremost, it gets kids excited about engineering at an early age by introducing them to fun, hands-on projects and provides strong and diverse role models through the NSBE college students teaching the courses. For us, it’s an opportunity to network with the college mentors who are some of the brightest minority engineering students in the country.

How has your corporation coordinated investments in education with future workforce needs?

Our University Relations team is committed to increasing awareness around STEM education as well as increasing retention of students in STEM fields. During 2012, many activities took place across strategic campuses, including guest lecturers and support of STEM-specific student organizations. Many of our recruiting teams are composed of CH2M HILL employees that are leading their own courses, including an Engineering Management course at University of Florida.

What principles do you apply to your professional and personal life to advance STEM education?

Our world is facing unprecedented challenges related to population growth, climate change and resource constraints. These dynamics make it an exciting time to be engineers or scientists, leading the way as the innovators who will create and implement the solutions. When I’m speaking—whether it is to our 28,000 employees, to our clients or at industry events—I emphasize the critical and exciting role that our profession plays in addressing these challenges in a holistic way. STEM is a noble profession, equipping its students with the technical know-how to turn the world’s most complex challenges into opportunities to advance our society.

I try to get out to a local high school at least a couple of times a year. It’s a good way to stay grounded, and, every time I walk out those doors, I’m re-energized with optimism that our future is in good hands.
Chambers takes an active role in corporate social responsibility initiatives worldwide and has said that the Internet and education are two of life’s great equalizers. Recent partnerships include working with the Obama Administration on an effort to help transitioning servicemen and women find training and jobs in ICT and the 21st Century Schools Initiative, which improved education in the Gulf Coast Region affected by Hurricane Katrina.

Chambers joined Cisco in 1991 as Senior Vice President, Worldwide Sales and Operations. He assumed the role of President and CEO in 1995. He holds a bachelor of science / bachelor of arts degree in business, a law degree from West Virginia University and a master of business administration degree in finance and management from Indiana University.

John Chambers is Chairman and CEO of Cisco, where he has received numerous awards for his leadership including for philanthropic endeavors. Chambers has twice received the U.S. State Department’s top corporate social responsibility award (ACE), in 2010 and 2005. He also received the first-ever Clinton Global Citizen Award from former U.S. President Bill Clinton, and has been awarded the Woodrow Wilson Award for Corporate Citizenship, and the prestigious Excellence in Corporate Philanthropy Award, an award given by CEOs to their CEO peers.

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Mr. Kent joined The Coca-Cola Company in Atlanta in 1978 and has held a variety of marketing and operations leadership roles throughout his career in markets across Europe, Asia and the Middle East. In 2005, Mr. Kent was appointed President of Coca-Cola International, responsible for overseeing all operations outside of North America. In 2006, he assumed the role of President and Chief Operating Officer and in 2008 was elevated to President and CEO. He was named Chairman of the Board of Directors in 2009.

Mr. Kent holds a Bachelor of Science degree in Economics from the University of Hull in England and a Master of Science degree in Administrative Sciences from Cass Business School, City University London.

Active in the global business community, Mr. Kent is Co-Chair of The Consumer Goods Forum, Chairman of the International Business Council of the World Economic Forum, a fellow of the Foreign Policy Association, a member of the Business Roundtable, a past Chairman of the U.S.-China Business Council and Chairman Emeritus of the U.S. ASEAN Business Council. He also is a member of the Eminent Persons Group for ASEAN, appointed by President Obama and former Secretary of State Clinton. He serves on the boards of 3M, Special Olympics International, Ronald McDonald House Charities, Catalyst and Emory University.

Muhtar Kent
Chairman and Chief Executive Officer
The Coca-Cola Company

The Coca-Cola Company is the world’s largest beverage company, refreshing consumers with more than 500 sparkling and still brands. Led by Coca-Cola, the world’s most valuable brand, our Company’s portfolio features 16 billion-dollar brands including Diet Coke, Fanta, Sprite, Coca-Cola Zero, vitaminwater, Powerade, Minute Maid, Simply, Georgia and Del Valle. Globally, we are the No. 1 provider of sparkling beverages, ready-to-drink coffees, and juices and juice drinks. Through the world’s largest beverage distribution system, consumers in more than 200 countries enjoy our beverages at a rate of more than 1.8 billion servings a day. With an enduring commitment to building sustainable communities, our Company is focused on initiatives that reduce our environmental footprint, support active, healthy living, create a safe, inclusive work environment for our associates, and enhance the economic development of the communities where we operate. Together with our bottling partners, we rank among the world’s top 10 private employers with more than 700,000 system associates.

How can we advance mentorships and apprenticeships in the STEM pipeline?
I would contend that most of the human advancement we’re witnessing today is the byproduct of dreamers and doers in the areas of science and technology who are never content with the status quo.

Already, over the course of the last few years, we have seen new breakthroughs in science, medicine, communication, agriculture, environmental engineering and energy conservation. All of this has helped reduce poverty and conflict to the lowest levels in recorded history. And today, life expectancy and education levels are at their highest levels.

Now think about what just one of these technological advances — telecommunications — has meant to Africa, for example. In the year 2000, only 2 percent of the continent’s population had access to mobile phones. Today, it’s over 70 percent.

Or think about what the Internet has already done to expand our connectivity, our knowledge capacity and our ability to demand transparency and truth. In the year 2000, only 361 million people were connected to the Internet worldwide. Today, that number is nearly 2.5 billion. By 2020, it is projected that 3 billion more people will have entered the Internet age.

What will these rising people dream? What will they discover? What will they demand? The positive implications for democracy including human rights, educational attainment and job creation are absolutely profound.

There’s a name I give to these people who dream, thrive and deliver in times of uncertainty; I call them the “constructively discontent.” At Coca-Cola, we learned this trait from our founder, a chemist by the name of Dr. John Pemberton who experimented, debugged, tested, and inspired young people like John and Roberto so system associates.

“...I would contend that most of the human advancement we’re witnessing today is the byproduct of dreamers and doers in the areas of science and technology who are never content with the status quo. Already, over the course of the last few years, we have seen new breakthroughs in science, medicine, communication, agriculture, environmental engineering and energy conservation. All of this has helped reduce poverty and conflict to the lowest levels in recorded history. And today, life expectancy and education levels are at their highest levels. Now think about what just one of these technological advances—telecommunications—has meant to Africa, for example. In the year 2000, only 2 percent of the continent’s population had access to mobile phones. Today, it’s over 70 percent. Or think about what the Internet has already done to expand our connectivity, our knowledge capacity and our ability to demand transparency and truth. In the year 2000, only 361 million people were connected to the Internet worldwide. Today, that number is nearly 2.5 billion. By 2020, it is projected that 3 billion more people will have entered the Internet age.

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Francisco D’Souza
Chief Executive Officer
Cognizant

Cognizant is a global provider of information technology, consulting and business process outsourcing services headquartered in Teaneck, N.J. We’re heightening our commitment to worldwide academic achievement, and helping educational systems around the globe produce talented, motivated IT professionals to meet the demands of the 21st century. To ensure a skilled, knowledge-based workforce that can continue to meet today’s and tomorrow’s challenges, we’re focused on improving the effectiveness of educational programs, increasing access to academic opportunity, and stimulating an interest in STEM learning in the countries in which we operate. Our efforts may be best exemplified by the Making the Future program, which spans young people’s interest in STEM disciplines by creating fun, hands-on learning opportunities. This initiative comprises after-school and summer programs, nonprofit partnerships, college scholarships and STEM education advocacy.

Francisco D’Souza is Cognizant’s Chief Executive Officer and a member of the Company’s Board of Directors. As CEO, Francisco is responsible for managing Cognizant’s growth as a leading provider of global consulting, information technology, and outsourcing services.

During Francisco’s tenure as Cognizant’s Chief Executive, revenues have grown from US$1.4 billion to over US$7 billion and the ranks of our employee base has grown from 55,000 to over 150,000. As a result of this strong growth, Cognizant has been named a member of the S&P 500, the Fortune 500, the Forbes Global 2000, and one of Forbes Fastest Growing Tech Companies. Francisco joined Cognizant as a co-founder in 1994 - the year it was started as a division of The Dun & Bradstreet Corporation.

Francisco is a member of the Board of Directors of General Electric Company. He also serves on the Board of Trustees of Carnegie Mellon University, the Board of Trustees of the New York Hall of Science and the Board of Trustees of the US India Business Council. He is a member of the World Economic Forum, the Business Round Table, and the Science Visiting Council for the acclaimed PBS science program, NOVA.

The son of an Indian diplomat, Francisco is a global citizen who has lived in nine different countries and traveled to many others. He obtained his Bachelor’s degree in Business Administration from the University of East Asia and his MBA from Carnegie-Mellon University.

How do you believe STEM education can improve a nation’s competitiveness?

Our world is increasingly dependent on technology — it’s pretty clear the next generation must be well-versed in STEM. But our view is that our needs go beyond STEM and that the issue goes beyond competitiveness. We see that creativity and innovation, coupled with STEM, are essential to producing the products and services we will need in the future. For this reason, we need to focus on both STEM and the arts — sometimes referred to as “STEAM.” And moving beyond competitiveness, we believe that education, and particularly STEM education, is the fundamental sustainability issue of our time, since the solutions to poverty, global health issues and climate change will require a highly educated and STEM-literate population.

Beyond Standards, what are the first steps we should take to curb the STEM education crisis?

We believe the most important step, even more than standards, is generating interest in STEM. Studies show that interest, not proficiency, is a stronger indicator of whether kids will pursue the STEM fields. Our “Making the Future” program, themed upon the do-it-yourself “maker movement,” seeks to inspire young learners in STEM by providing fun, hands-on learning opportunities. We also believe we can close the achievement gap by getting more children from underserved communities excited about STEM — since there are many great-paying entry-level jobs available for them. When more students pursue STEM education, it will raise the overall proficiency of our population, following the adage “a rising tide lifts all boats.”

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

We believe there are three aspects to encouraging women and underrepresented minorities to continue pursuing STEM studies. First, focus on generating interest with this population, particularly through engaging learning opportunities that appeal to their interests. For example, research has shown that girls tend to be more interested in engineering activities that have a social purpose, perhaps building a computer-controlled hydroponic system that would provide food in urban “food deserts.” Second, provide more minority and women STEM mentors and high-light role models for these young people. And finally, make them aware of the tremendous opportunities to make a significant impact on our world, which in turn will lead to tremendous economic opportunity for themselves and their families.

What is the STEM initiative that your company has supported are you most proud of?

We are most proud of our Making the Future after-school and summer programs. This year we will provide over 20 grants to child-serving organizations, like museums, libraries, “makerspaces,” 4-H and Boys & Girls Clubs, to run programs that give kids the environment, tools and mentors to actually build things. Kids in these programs will get to use electronics, open source micro-controllers like Arduino and Raspberry Pi, digital fabrication tools like vinyl cutters, CNC routers and 3-D printers, and programming languages like Scratch. In other projects, they will get to work with digital music, hydraulics or, for younger kids, Squishy Circuits. We are extremely proud of this program and the impact it is having on generating interest in STEM.

How can we advance mentorships and apprenticeshipes in the STEM pipeline?

Solving our nation’s STEM crisis, and closing the achievement gap for underrepresented minorities, requires an all-hands-on-deck call to STEM professionals to mentor children from kindergarten through college in all kinds of high-quality ways. We are answering this call by becoming a founding partner of US2020, a new initiative whose goal is to mobilize one million STEM mentors by 2020, creating millions of moments of discovery — those eureka moments when launching rockets, building robots or looking through microscopes causes these children to open their eyes wide — and open the door to a brighter future. We need more companies to commit to the vision of US2020.

What is your advice to those involved in promoting STEM education?

Focus on generating interest by finding great projects that engage kids, giving them the opportunity, tools and mentors to do these projects and then getting out of the way to let their passions run wild.

What is your advice on using private-public partnerships to tackle our most pressing education challenges in STEM?

We have had tremendous success in developing public-private partnerships that provide great outcomes for kids, such as with organizations like Citizen Schools, 4-H Boys & Girls Clubs, and by working with leaders at the White House Office of Science and Technology Policy. Our success has been driven by three factors: commitment at the top, with myself and Cognizant President, Gordon Coburn; a willingness to make a substantial enough investment to move the needle; and putting a senior leader in charge of our program who is capable of forging these kinds of partnerships. In our case, we assigned our chief information officer to lead our STEM initiatives.

Brian L. Roberts is Chairman and CEO of Comcast Corporation, a global media and technology company with two primary businesses, Comcast Cable and NBCUniversal. Comcast Cable is the nation’s largest video, high-speed Internet and phone provider to residential customers under the XFINITY brand and also provides these services to businesses. NBCUniversal operates 30 news and entertainment cable networks, the NBC and Telemundo broadcast networks, television production operations, television station groups, Universal Pictures and Universal Parks and Resorts. Visit www.comcastcorporation.com for more information.

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Why do you believe STEM Education/workforce development is critical to our nation’s future?

I think working with community organizations, particularly diverse organizations, to help reinforce the real need for people with STEM skills is one way. This, combined with meaningful opportunities for people to get tech experience through internships, scholarships or funding for tech programs in the community is also important. We need to help these students recognize the importance of studying science, math and technology to advance in today’s digital age. That’s where corporate support of organizations like FIRST can help. FIRST was started by inventor and entrepreneur Dean Kamen to make science, technology, math and engineering fun for kids from kindergarten through 12th grade. Through FIRST, students are connected with mentors working at companies like NASA, Boeing—and Comcast—who can help them build science, engineering and technology skills.

How do you encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

I’ve received the Fred Dressler Achievement Award from the S.I. Newhouse School of Public Communications at Syracuse University. He and his father, Ralph J. Roberts, were inducted into Babson College’s Academy of Distinguished Entrepreneurs Hall of Fame in 2011. Brian received his B.S. from the Wharton School of Finance of the University of Pennsylvania. He and his wife live in Philadelphia with their three children.

What area of STEM are you most passionate about?

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What do corporate leaders need to effectively support and advance STEM education today?

I think it starts with making a commitment to support education in general, and then making STEM functions a focal point. It’s really about providing the resources needed to help advance the next generation of technologists by creating real opportunities for students to gain experience. We’ve been a partner with FIRST Robotics Competition for several years. This year, we’ve expanded our support to include funding and mentoring for 52 different robotics teams across the country. We’ve also worked with FIRST to sponsor a new Media & Technology Innovation Award. Additionally, we invest in programs and nonprofit groups that share our company priorities of digital literacy, leadership development and service. In our hometown, Comcast was one of the first companies to commit to hiring students from the new Cristo Rey Philadelphia High School. As part of the Cristo Rey Work Study Program, 20 of the school’s 125 students spend one day per week at Comcast working in departments that include Engineering, Marketing & Operations, Business Services and Financial Operations. In addition to gaining real-world work experience, these paid internships help make a private, college preparatory education available to students who otherwise might face financial challenges.

Over the last 10 years, we have invested heavily in developing our broadband network, becoming the country’s leading broadband provider, which makes us uniquely positioned to help bridge the digital divide. Through our Internet Essentials program, we’re providing lower income families across the country the option to purchase a low-cost Internet service to encourage broadband adoption. Since the launch of the program in August 2011, we’ve connected more than 150,000 low-income families—or 600,000 Americans—to the power of the Internet at home, most for the first time.

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Wendell P. Weeks
Chairman and Chief Executive Officer
Corning Incorporated

Corning Incorporated is the world leader in specialty glass and ceramics. Corning invents, develops, and sells key components that enable high-technology systems for consumer electronics, telecommunications, mobile emissions control, and life sciences.

Corning succeeds through sustained investment in research and development, deep materials and process engineering knowledge, and a highly collaborative culture. Although Corning’s products and markets have changed many times during its 162-year history, highly engineered specialty glass is the common denominator.

Corning is home to one of the earliest R&D labs in the United States and continues to invest strongly in materials and process research. Corning is a four-time winner of the National Medal of Technology, including an award for general contributions to industry and society through life-changing and life-enhancing inventions.

Learn more at www.corning.com.

Why do you believe STEM Education and Workforce Development are critical to our nation’s future?

We are competing in a global economy where technology innovation is the biggest differentiator. STEM Skills are essential ingredients of innovation; they’re vital to ensuring America’s competitiveness; and they expand opportunities for job seekers in a challenging economic environment.

This is something that Corning experiences first hand. Our company has succeeded for 162 years through sustained investment in R&D and deep materials science and process engineering expertise. We have a highly technical workforce, and the majority of our hiring needs in recent years have been for manufacturing, engineering, R&D, Finance and IT jobs.

Our innovations have enabled us to succeed in industries (e.g. liquid-crystal display glass) that are dominated by other world regions. But to continue doing so, we need to make sure we can fill the pipeline with top talent.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

We need to identify those pivotal points where students are likely to lose interest. Middle school is a time when a lot of students who were previously high achievers start to struggle, and where girls are most likely to turn away from science and math. We need to make sure they have engaged teachers, and dynamic programs that stimulate their scientific curiosity.

The Full Option Science System (FOSS) program that Corning launched in collaboration with our local schools is a good example. FOSS takes an experiential approach to science, replacing textbooks with modules that require students to work in teams to understand concepts like chemical interactions. We first deployed FOSS in grades 6-8, and saw mastery rates on standardized tests improve by 42% after just one year with the program. FOSS is now fully developed in 550-pointed Post schools and is being introduced in a number of schools in other districts.

There are also opportunities to engage students outside the classroom. Corning supports several teams for the FIRST robotics competition, which was started by Dean Kamen and now includes almost 100,000 middle and high school students worldwide. Corning provides funding and allows employees to volunteer their time in a coaching capacity.

Finally, our employee groups are very involved. Corning’s Society of Women Engineers holds an annual egg drop contest that challenges kids to create a container that can protect a raw egg from breaking after a 32-foot fall. It really encourages the participants’ creativity. And because they interact with women engineers, it also helps inspire girls about career paths in science.

What is the STEM initiative that your company has support that you are most proud of?

This is actually very personal for me. In 2003, my wife Kim founded the Alternative School for Math and Science (ASMS) because she and several other community leaders recognized that the public school system alone could not meet the needs of all our students. We wanted to provide a supportive environment for middle-school students and a challenging curriculum focused on skills that are becoming increasingly important in today’s world. Corning has strongly supported ASMS, including funding a $35,000 square foot expansion in 2011. Approximately 75% of ASMS graduates are pursuing STEM courses of study, which is well above the 15% national average.

What do we need in the U.S. to continue to be at the top of global innovation?

Most importantly, we need sustained investment in Research, Development, and Engineering. In a tough economy, organizations often cut back on the R&D spending to focus on more immediate priorities. Yet, ongoing innovation is the key to our growth as a company and as a nation. We also need public policy that encourages innovation, such as tax credits for R&D and strong protection for intellectual property. And we need school systems that equip our students to succeed in a world that is becoming more global and high tech.

What is your advice on using private-public partnerships to tackle our most pressing education challenges in STEM?

At Corning, we’re firm believers that effective private-public partnerships are vital to building strong communities. But success depends on much more than financial investment. It requires real collaboration between partners—and that begins with meaningful dialogue.

Our Corning Enterprises organization regularly meets with the local school superintendent and key staff members to identify and evaluate appropriate opportunities for Corning’s involvement. Based on their input, we’ve learned about valuable support we can provide that we may not have considered, such as benchmarking and analytical help. And these discussions have given us the opportunity to propose innovative strategies such as the FOSS program (described above).

Private-public partnerships can pool talent and resources to make a real difference, but participants need to communicate openly and candidly, make balanced contributions, and be committed to seeing the initiative through.
Anthony J. Orlando
President and Chief Executive Officer
Covanta Holding Corporation

Covanta Energy Corporation is an internationally recognized owner and operator of Energy-from-Waste and renewable energy projects and a recipient of the Energy Innovator Award from the U.S. Department of Energy’s Office of Energy Efficiency and Renewable Energy. Covanta’s 44 Energy-from-Waste facilities provide communities with an environmentally sound solution to their solid waste disposal needs by using that municipal solid waste to generate clean, renewable energy. Annually, Covanta’s modern Energy-from-Waste facilities safely and securely convert approximately 20 million tons of waste into 9 million megawatt hours of clean renewable electricity and approximately 9 billion pounds of steam that are sold to a variety of industries.

Covanta is continually seeking STEM talent in the fields of technical, instrumentation, controls, boiler, turbine and other technical areas of power generation as well as finance, IT, human resources, sustainability and environmental science.

Mr. Orlando is the president and chief executive officer (CEO) of Covanta Holding Corporation and a member of the company’s Board of Directors. Throughout his more than 25 years of tenure with Covanta, Mr. Orlando has served in numerous leadership roles including senior vice president, Business and Financial Management and senior vice president, Energy-from-Waste. Earlier in his career with Covanta, Mr. Orlando managed the construction of new Energy-from-Waste facilities.

Mr. Orlando earned a Bachelor of Science in Civil Engineering from Villanova University in Villanova, Pennsylvania, and an M.B.A. in Finance from Seton Hall University in South Orange, New Jersey. He is a past member of Villanova’s Engineering Advisory Board (2007-2010). In addition, Mr. Orlando has been tapped to participate in STEM-related discussions and panel meetings.

Why do you believe STEM Education and workforce development are critical to our nation’s future?

Growth in virtually every sector of the economy is being driven by technological advances. Therefore, the demand for people with science, technology, engineering and math expertise continues to grow. And, with an increasingly globalized economy, it is becoming more difficult for the U.S. to attract the best and the brightest from other countries. This trend is likely to continue and as such, I believe the U.S. must improve our STEM education and attract more American students into this field. Unfortunately, the supply of STEM educated students in the U.S. is not keeping up with demand for the highly skilled workforce needed to fuel today’s economy. Furthermore, Americans who have an interest in pursuing a STEM career typically gravitate towards computer science and not to the traditional science and engineering fields necessary to support power generation and infrastructure development.

If the U.S. is to maintain its competitive edge and attract this talent, the country will have to invest more heavily in STEM education. By building on STEM initiatives and creating public-private partnerships, we can build talent pools that will help reinvigorate the economy while also creating a long-term competitive advantage. In order to be truly competitive, America must have a low-cost, reliable and clean energy infrastructure. With its leading universities and community college network, as well as innovative companies and entrepreneurial culture, the U.S. is well positioned to lead the world in developing sustainable energy and waste management solutions.

But, to achieve this goal we must also have the STEM-educated workforce.

What area of STEM are you most passionate about?

Covanta Energy is developing several innovative solutions beyond our core business to solve environmental challenges related to managing waste and generating electricity in the most sustainable manner. This is what we are most passionate about and we are constantly looking to expand these initiatives into viable business strategies for our future growth. Some areas where we are continually seeking STEM talent include: R&D, combustion controls, environmental controls, electrical design, as well as instrumentation, controls, boiler, turbine and other technical areas of power generation. In addition, we’re seeking professionals in finance, IT, human resources, sustainability and environmental science. Covanta has many entry-level and middle management positions that STEM-educated employees could potentially find to be great learning opportunities, as well as opportunities for professional growth. We believe in preparing our employees for roles of increasing responsibility and, in turn, provide educational assistance as part of our comprehensive benefits package. Supported by our in-house, on-the-job training and continuing education programs, we seek to cultivate employees into future leaders within our organization.

We have an impressive geographical footprint spanning across the U.S. and are committed to the communities in which we are located. As part of this commitment, we partner with local K-12 schools, area colleges and local interest groups to educate various audiences on the benefits of energy-from-waste technology and our environmental commitment. Our community outreach also showcases the career opportunities available within the energy-from-waste industry and helps to encourage students to pursue STEM-related careers.

“...If the U.S. is to maintain its competitive edge and attract this talent, the country will have to invest more heavily in STEM education.”
Michael J. Ward
Chairman, President and Chief Executive Officer
CSX Corporation

CSX Corporation, together with its subsidiaries based in Jacksonville, Fla., is one of the nation’s leading transportation suppliers. The company’s rail and intermodal businesses provide rail-based transportation services including traditional rail service and the transport of intermodal containers and trailers. Overall, the CSX Transportation network encompasses about 21,000 route miles of track in 23 states, the District of Columbia and the Canadian provinces of Ontario and Quebec. Our transportation network serves some of the largest population centers in the nation. Nearly two-thirds of Americans live within CSX’s service territory. CSX serves major markets in the eastern United States and has access to over 70 ocean, river and lake port terminals along the Atlantic and Gulf Coasts, the Mississippi River, the Great Lakes and the St. Lawrence Seaway. CSX moves a broad portfolio of products across the country in a way that minimizes the effect on the environment, takes traffic off an already congested highway system, and minimizes fuel consumption and transportation costs.

Year’s prestigious Lifetime of Idealism Award. He earned a bachelor’s degree from the University of Maryland in 1972 and received a master’s degree in business administration from the Harvard Business School in 1976. Mr. Ward is a member of the Board of Directors of the Association of American Railroads, and also serves on the boards of Ashland Inc., City Year, United Way of Northeast Florida, and Hubbard House. His other business affiliations include The Florida Council of 100, and The Business Roundtable.

CSX, based in Jacksonville, Fla., owns one of the nation’s leading transportation companies, providing rail, intermodal, and rail-to-truck transload services that connect 70 ocean, river, and lake ports, as well as more than 240 short line and regional railroads. Its principal operating company, CSX Transportation, Inc., which has approximately 32,000 employees, operates the largest railroad in the eastern United States with a 21,000-mile rail network linking commercial markets in 23 states, the District of Columbia, and two Canadian provinces.

Why do you believe STEM education/workforce development is critical to our nation’s future?

STEM disciplines are integral to the free enterprise system, and a major contributor to economic and social progress. To remain competitive and to grow, businesses require an expanding pool of qualified employees, particularly those versed in the STEM disciplines. The ability to participate fully in global commerce rests largely on a nation’s ability to innovate in areas linked directly to science, technology, engineering and math. Defense capabilities are another important area in which a nation must have leading STEM knowledge and skills.

As for workforce development, successful businesses engage in robust programs to keep employee skills current and relevant. To that end, CSX operates the Railroad Education and Development Institute in Atlanta to provide a range of training and educational opportunities.

How do you believe STEM education can improve a nation’s competitiveness?

Economic diversity, and the preservation of technical skills necessary for manufacturing, can help the U.S. compete in an increasingly complex society. From where we sit as part of North America’s circulatory system, supporting virtually every major market, it’s clear that America is poised to leverage a resurgence of manufacturing. New domestic sources of natural gas and crude oil, combined with the nation’s rich reserves of coal, are creating opportunities to exercise manufacturing skills and stimulate job growth. STEM education is central to building a capable workforce that can innovate and create products that help address issues ranging from the state of infrastructure to the delivery of health care.

How do you encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

The workforce of tomorrow is in school today. That’s why it is critically important to identify and leverage relevant ways to communicate education’s value proposition.

More specifically, the business community and others have an obligation to emphasize in clear, meaningful ways the opportunities associated with science, technology, engineering and mathematics. Introducing STEM subjects earlier in formal education and more prominently in general curricula would help position those subjects as a regular course of study like English or history, rather than specialized disciplines available only to those who have innate abilities. Just as we do with broader education, clear alignment between economic success, quality of life, and STEM skills must resonate with women and underrepresented minorities. Mentors, scholarships and other incentives could be deployed creatively to recruit women and underrepresented minorities.

What traits do corporate leaders need to effectively support and advance STEM education today?

Corporate leaders should possess a deep-seated appreciation for STEM education and skills, overlaid with an acknowledgement that enormous opportunities are available to enterprises and individuals with competencies in science, technology, engineering and math. We should always be looking for additional ways to support both public and private industry initiatives to increase STEM education. Corporate leaders, who already have a platform to advocate and influence, can devise specific, actionable programs to reach young people in thoughtful, effective ways. As an example, CSX partners with City Year to pair employees with at-risk students to keep them in school, an important first step in expanding the pool of qualified employees.

What area of STEM are you most passionate about?

I’m passionate about the transformative ability of technology. In the 21st century, progress is defined by those companies able to harness technology’s immense power. In the railroad industry, technology has been part of every major advance in the last half century, from the first introduction of computers in the late 1950s to today’s sophisticated railway infrastructure and equipment. Enormous gains in safety, productivity and customer satisfaction can be traced to the development and introduction of technologies that include trackside scanners, massive data storage and retrieval capabilities, and information management that keeps shipments on schedule. It’s also necessary to acknowledge the critical role of engineering in development of increasingly safer and more reliable tracks, bridges, signal systems, locomotives and rail cars.
Tom Linebarger is the Chairman and CEO of Cummins Inc., the largest independent maker of diesel engines and related products in the world.

A native from California, Tom has a hybrid education background in both economics and mechanical engineering from Claremont McKenna College and Stanford University. He later returned to Stanford University to earn an MS in manufacturing systems from the School of Engineering and an MBA from the Graduate School of Business in 1993.

Tom has held various technical and management positions since joining Cummins. His diverse work experience makes him a strong believer of investing in STEM education, which has made the company successful in leading industry technology and delivering superior results to customers.

Cummins is a global Fortune 160 company, who is a leader in a variety of engine, energy and component technologies, strives to invest in STEM to incubate talents and engage communities to in building better environments for STEM education.

Partnering with many STEM organizations, including Project Lead The Way, Society of Hispanic Professional Engineers and Society of Women Engineers, Cummins actively engages engineers to create fun and meaningful activities to promote STEM initiatives. Cummins employees worked with students to coach the robotics team, assemble engine models from LEGO® bricks and host STEM awareness nights at local schools. Cummins engineers use their interests and skills to inspire young minds to explore the world of STEM.

As a part of Cummins’ commitment to company core values, the STEM initiative is critical to our efforts to cultivate and retain talent, and just as importantly, it is our responsibility to provide resources and opportunities for students to build a better future through pursuing STEM careers.

What traits do corporate leaders need to effectively support and advance STEM education today?

While the need for STEM-skilled workers is clear from statistics, it will take creativity and foresight to solve the problems necessary to develop these workers. We believe that by supporting our Company Diversity Initiatives, creating a mutually supportive environment between education and industry and breaking down long-held stereotypes held by parents and students about manufacturing positions, we can take steps to advance STEM education. Corporate leaders must have a passion for innovation and understand that STEM education not only elevates our students’ academic abilities, but also empowers them to think creatively and gives them tools to bring their dreams to reality.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

To encourage students to continue their study of STEM subjects, we believe it is important to connect young talent with industry role models. Often, students, especially females and minorities, cannot envision themselves practicing STEM careers in future. By engaging with role models, students have the opportunity to directly interact with successful STEM professionals, listen to interesting career stories and become excited to study in STEM subjects. Cummins recently partnered with education curriculum provider Project Lead The Way (PLTW) to help STEM middle school students build an engine model with LEGO® bricks. This program enabled Cummins engineers to share their stories and perspectives with students and encouraged them to discover their interests in STEM.

What do corporations need to do to create more STEM careers and fill existing jobs?

One method of filling these jobs is by developing interest in STEM fields at an early age. It is important for companies, non-profits and professional societies to engage with elementary and middle school students through in-school demonstrations and hands-on activities to get them excited about the opportunities available in STEM fields. Cummins recently hosted a STEM Fair at Smith Elementary, where 400 students and parents rotated through 10 hands-on exhibits to learn early principles of engineering and see how they apply in the real world.

At the high school level, it’s important to demonstrate to students why the concepts that they learn in math and science are relevant and how they can be applied to solve real-world problems.

What do we need in the U.S. to continue to be the top of global innovation?

Education is the single most important factor in achieving U.S. innovation competitiveness globally. According to a 2009 study, the U.S. ranks 25th in math, 17th in science and 14th in reading amongst developed countries. How can we as a nation continue to be competitive in this global economy when the next generation of workers is starting at a disadvantage against their international peers?

Improving education, however, falls on everyone’s shoulders. Parents need to ensure that their students get the right start by enrolling them in early education. The education system itself also needs to adapt to teaching 21st century capabilities such as team-work, leadership, written and verbal skills and technology proficiency in addition, industry must take a stronger stake in education by taking part in developing schools’ curriculum, creating internships for talented students and supporting communities with valuable education opportunities and resources.

How do you believe STEM education can improve a nation’s competitiveness?

In a world where commodities can be copied or created less expensively, the most effective way to remain competitive is through innovation. By providing unique value to the customer, companies set themselves apart. Cummins has positioned itself not as an “engine” company but a “diesel technology” company. We create value for our customers not only by producing a competitively-priced, durable and reliable product, but also by being first-to-market with emissions-reduction technology and other product innovations that delight end-users.

STEM education produces students who are creative thinkers that will develop innovative products and technologies to impact our world. STEM teaches skills of critical thinking and analysis that inspire individuals to question their environments and constantly seek to improve them. By empowering students with technical skills and innovative thinking, STEM education ultimately benefits our nation and our world.
Al Bunshaft is President and CEO of Dassault Systèmes Americas where he spearheads key strategic initiatives and corporate programs, including the company’s expansion into the U.S. government federal sector. He is also responsible for the company’s relationships with key stakeholders such as financial and industry analysts, private, public and academic leaders, as well as foreign diplomats.

Bunshaft was a key architect in Dassault Systèmes’ acquisition of the IBM PLM business, an acquisition that involved the transfer and management of thousands of enterprise accounts. As Managing Director of Dassault Systèmes Americas, he helped build the foundation for future company growth by leading the operations and communication functions of a business with more than 3,000 employees. Bunshaft led the selection, design, construction and opening of the company’s new Americas headquarters in Waltham, Massachusetts.

Bunshaft is Dassault Systèmes’ leading voice in corporate citizenship and science, technology, engineering and mathematics (STEM) initiatives, such as Teachers at Dassault Systèmes (TADS) and “Day of Service at Dassault Systèmes.”

He represents the company as a member of the STEM subcommittee of the Clinton Global Initiative and is a board member of the Massachusetts High Technology Council, where he co-chairs the Education and Talent Development Committee. Bunshaft also serves as an advisory board member at the Department of Information and Computer Science of the State University of New York at Albany. He regularly writes and speaks about STEM topics.

He received his Bachelor of Science in Computer Science and Mathematics from University at Albany, State University of New York and a Master of Science in Computer Engineering from Rensselaer Polytechnic Institute (RPI).

Dassault Systèmes, the 3DEXPERIENCE Company, provides businesses and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced and supported. Dassault Systèmes’ collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. Today, Dassault Systèmes 3DEXPERIENCE Platform is a business experience platform delivered on-premise, on-line, in public or through a private cloud. The company’s portfolio delivers 3D realistic virtual experiences comprising social and collaborative applications, 3D modeling applications, content and simulation applications and information intelligence applications.

Dassault Systèmes has 170,000 enterprise customers across 12 industries, 3,500 partners in 140 countries, with 10 million on-premise users and 100 million online users. The company has 11,000 employees globally, with approximately 3,000 located in North America.

Al Bunshaft
President and Chief Executive Officer
Dassault Systèmes Americas

How do you believe STEM education can improve a nation’s economy?
Emerging countries can no longer depend on a lower cost of doing business as their competitive advantage. Mature economies need to reinvent themselves. Innovation in STEM related fields is driving national economic policies. It’s through invention and innovation that nations find a place in the new economic order, fueled by fresh answers to old and new challenges. Creating and developing smart and eco-friendly products and services, or the most effective cure for a long-standing disease requires a talent pool well-versed and well-prepared in the fields of science, technology, engineering and math. Hence, there is a need to build a strong national workforce that is well-equipped to drive innovation and help secure a nation’s competitive place in today’s world.

Beyond standards, what are the first steps we should take to curb the STEM education crisis? The key to attracting and motivating more students into STEM careers is one simple word: inspiration. Most standards today are too focused on academic requirements and metrics. We must grow the pipeline of young people interested in STEM related careers. We are losing too many kids to other disciplines because they are not seeing the value and connection of STEM subjects to their ability to bring change to the world. STEM technologies are essential and critical to innovation in almost any industry today, from healthcare to food, retail, or transportation. To significantly increase the number of students choosing STEM careers, we have to help teachers understand and experience the connection between workplace skills and STEM teaching subjects. Parents also need to understand the new requirements of the workplace and how STEM skills can unlock interesting and lucrative opportunities for their children. When I meet with kids, I take the time to connect the role technology has today in every single one of their product experiences—from the design and production of the latest car or airplane, to the most advanced sports equipment or medical device.

What STEM initiative supported by your company are you most proud of? Recent years have seen a dramatic increase in the focus on STEM skills development. Most of this focus has been placed on the students. While that is needed, an increase in the ability of teachers to demonstrate the value of STEM skills and their linkage to exciting opportunities will pay dividends years after year. We at Dassault Systèmes (Americas) have created TADS (Teachers at Dassault Systèmes), a summer program, now in its second year; launched as part of our commitment to the Clinton Global Initiative America. TADS allows teachers to spend their summer within a STEM-oriented business and learn the practical value of a STEM education. TADS participants work with employees to gain first-hand visibility to the types of jobs in a technology company and to add practical materials to their STEM related curriculum. Passionate teachers, equipped with real world experiences and interesting new materials, can fuel students’ interest and excitement by connecting STEM concepts to real world solutions. Investing in teachers can lead to those teachers inspiring students year after year.

What is your advice to those involved in promoting STEM education? Make it real. It is rare that a student gets excited by calculus or physics textbooks and exercises alone. Making the connection between what appear to be purely academic topics and exciting, real-world projects is what makes STEM exciting. I experienced this myself, but it took an industry-funded graduate school level project for me to have that truly inspiring revelation. We need that “ah ha” moment to happen at a much younger age—and there’s no reason it should not. For our part, business leaders need to be more involved in raising the visibility of the exciting opportunities that STEM careers make possible. This is part of my work with the Mass High Technology Council (MHTC), where I co-chair the Education and Talent Development Committee. Through active collaboration between teachers, parents, business and government leaders, we are working to increase the number of professionals available to face the complex issues of a modern and sophisticated nation. Regardless of whether someone’s desire is to make the world a better place, or to simply pursue a career with good earning potential and longevity, STEM skills are a ticket to a wealth of opportunities.

Dassault Systèmes Americas
Sam Allen is Chairman and Chief Executive Officer of Deere & Company, a position he has held since February 2010. Allen was named President and Chief Executive Officer of the company and a member of the Deere & Company Board of Directors in June 2009. Previously, he served as President, Worldwide Construction & Forestry Division, John Deere Power Systems, and the Worldwide Agricultural Division including managing operations in Latin America, China & East Asia, and Australia.

In addition, Allen also serves as Chairman of the Council on Competitiveness as of January 2010. He was appointed to Whitpool Corporation’s board of directors in June 2010. He is a 1975 graduate of Purdue University with a bachelor’s degree in industrial management. He is a native of Sumter, South Carolina.

Since joining John Deere in 1975 as an engineer, Allen had worked in positions of increasing responsibility in the Consumer Products Division, Worldwide Construction & Forestry Division, John Deere Power Systems, and the Worldwide Agricultural Division including managing operations in Latin America, China & East Asia, and Australia.

Why do you believe STEM Education/workforce development is critical to our nation’s future?

Economic growth, development, and competitiveness in an interconnected, technology-driven global economy are increasingly dependent on a high quality, diverse workforce with strong STEM (Science, Technology, Engineering, and Mathematics) skills. At John Deere, approximately 40% of its global salaried employees work in STEM-related jobs supporting innovation, which is one of John Deere’s core values. We believe that STEM literacy is increasingly important for all students regardless of career choice to support 21st century learning and jobs.

Deere & Company (NYSE: DE) is the world’s leading manufacturer of agricultural equipment as well as a top supplier of product solutions for the construction, forestry and turf care industries. The company and its nearly 67,000 employees are committed to the success of customers whose work is linked to the land—those who cultivate, harvest, transform, enrich and build upon the land to meet the world’s dramatically increasing need for food, fuel, shelter, and infrastructure.

At John Deere, approximately 40% of its global salaried employee work in STEM-related jobs supporting innovation, one of John Deere’s core values. John Deere supports STEM through its John Deere Inspire initiative which includes partnerships with FIRST Robotics, Project Lead the Way (PLTW), 4-H, SAE A World in Motion (AWIM), and SECME.

Visit John Deere on its website at www.JohnDeere.com

Deere & Company
In the United States, Deloitte LLP and its subsidiaries have 57,000 professionals with a single focus: serving our clients and helping them solve their toughest problems. Deloitte works in four key business areas—audit, financial advisory, tax, and consulting—but our real strength comes from combining the talents of those groups to address clients’ needs. Fortune and BusinessWeek consistently rank Deloitte among the best places to work, which is good news for Deloitte’s talent and clients alike.

Deloitte employs over 5,000 professionals in STEM fields in order to serve our clients. Deloitte is actively engaged in ensuring the pipeline of STEM professionals will be able to meet future workforce needs.

Joe Echevarria is CEO of Deloitte LLP, where his leadership responsibilities extend to approximately 60,000 professionals in nearly 90 U.S. cities and India.

He joined the Deloitte U.S. Firms in 1978 and became an audit partner in 1988. Since that time, he has held a wide range of leadership positions, most recently U.S. Managing Partner—Operations.

As part of his current role, Echevarria chairs the U.S. Executive, is a member of the U.S. Board, the Deloitte Touche Tohmatsu Limited (DTTL) Executive and DTTL Board, and serves on the Americas Executive.

Like all Deloitte professionals, Echevarria’s work plays a crucial role in serving the investor public and protecting capital markets, while providing high quality service to some of the firm’s largest and most valued clients. Deloitte hires more than 15,000 annually and Echevarria is known for his passionate support of talent and commitment to inclusion.

Echevarria frequently speaks to influential media such as CNBC, Fox Business, The Wall Street Journal, and Reuters about issues such as the U.S. Economy and business trends, professional services, and the audit profession. Actively engaged in Washington, D.C., Echevarria was a panelist for the 2012 White House Forum on Women and the Economy and a keynote speaker at the U.S. Chamber of Commerce’s Annual Capital Market Summit. He has joined other CEOs to tackle some of the country’s biggest challenges through participation in both the Fix the Debt campaign and the Business Roundtable, where he currently serves on the Select Committee on Immigration. Echevarria also regularly meets with leaders on both ends of Pennsylvania Avenue.

He earned his bachelor’s degree in business administration from the University of Miami, where he serves on the Board of Trustees and chairs the Business School’s Board of Overseers.

Why does Deloitte believe STEM Education and workforce development are critical to our nation’s future?

STEM graduates are our country’s fuel for economic growth and critical to innovation, and, as a nation, we face a shortage of 230,000 STEM workers by 2018. Recruiting new talent through education is an important part of addressing this shortage, but it is not enough to meet the demand. In order for the U.S. to continue to grow and stay ahead of the competition, businesses must invest in the continuing development of workers at all stages of their careers.

Deloitte recognizes the importance of worker retraining, to maintain a nimble, highly-skilled workforce. We have made a significant long-term commitment in Deloitte University (DU), our signature state-of-the-art campus, where employees can go to sharpen their skillsets, learn best practices, and maintain their intellectual edge. Through DU, our aim is to grow the world’s best leaders and create an environment where ideas prosper and leaders thrive.

How does Deloitte encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

With the critical shortage of math and science talent, women remain underrepresented in most technical professions—and business’ need for scientists and engineers remains unmet. Deloitte’s sponsorship of the Sally Ride Science Festival is one example of our commitment to encouraging young women to consider careers in math, science and engineering.

How has Deloitte coordinated investments in education with future workforce needs?

Deloitte employs over 5,000 people in STEM fields, and yet we still have many unmet needs.

We invest heavily in education with our campus presence across the United States, our continuing education with our own workforce, and through our pro bono and well-based volunteerism efforts.

We know how important it is to continually train and reinforce skills once a workforce is employed, so in 2011 we opened Deloitte University (DU), our signature state-of-the-art campus, where employees can go to sharpen their skillsets, learn best practices, and maintain their intellectual edge.

We also work with organizations such as the non-profit College Summit, which helps high schools and their surrounding communities develop college-going cultures in underrepresented areas. College Summit combines teacher training, community outreach, coaching and counseling, and robust data tracking that facilitates accountability in high schools.

These are some of the ways in which we help to ensure that the pipeline for tomorrow’s workforce will be able to meet our future needs.
David Zaslav
President & Chief Executive Officer
Discovery Communications

Discovery Communications is the world’s #1 nonfiction media company dedicated to satisfying curiosity through 162 worldwide television networks, led by leading global brands such as Discovery Channel and Science Channel. Discovery also is a leading provider of educational products and services to schools and owns and operates a diversified portfolio of digital media services, including Revision3.

Discovery also has launched “Connect the Dots,” a new multimedia, national STEM education initiative across its networks, education and digital platforms, which is designed to help make STEM a critical part of kids’ lives, prepare them for the jobs of the future and inspire the next great discovery. “Connect the Dots” programs include Discovery Education STEM Camp, offering after school and summer STEM resources for educators, camp administrators and parents at no cost, and a partnership between Science Channel and America’s manufacturers to promote careers in the skilled trades, among other initiatives.

Why do you believe STEM Education/workforce development is so critical to our nation’s future?
Our kids are the next generation of innovators, problem solvers and game changers, and we need them to take on the planet’s challenges and shape a bright, healthy future by embracing STEM careers.

How do you believe STEM education can improve a nation’s competitiveness?
If we want to compete, win, and prosper in the global economy, then we must be leaders in the ways we advance and strengthen the skills and education of our people. Growing our economy takes more than just attracting business and creating jobs, it also requires equipping those businesses and filling those jobs with a world-class workforce. Addressing the growing gap between the needs of employers and the skills of America’s workforce is a critical issue for the country’s success, and a key to lowering unemployment and boosting the economy on both the local and national level.

What is the STEM initiative that your company has supported are you most proud of?
Discovery is most proud of “Connect the Dots,” a new, global STEM education effort designed to illuminate pathways for kids to achieve today and lead tomorrow in inspiring interest in STEM subjects and careers within industries looking for highly skilled workers. The goal of “Connect the Dots” is to connect kids, parents and communities with all of Discovery’s STEM programs across its networks, education and digital platforms. Discovery is passionate about doing our part to make STEM a daily part of kids’ lives in order to prepare them for the jobs of the future and inspire the next great discovery.

“Connect the Dots” efforts include: the launch of Discovery Education STEM Camp, offering after school and summer resources at no cost; new science-focused on Discovery Channel and Science Channel; a partnership between Science Channel and America’s manufacturers to promote careers in the skilled trades; and the Lumosity Education Access Program (LEAP), a no-cost program for K-12 schools that seeks to study the effects of cognitive training in the classroom.

Where do you see the biggest area of opportunity in advancing STEM jobs/careers?
Building STEM literacy among America’s next generation of leaders is critical to meet the global challenges that lie ahead and prepare students for tomorrow’s careers, and classroom learning is certainly key to this effort. However, we know that learning doesn’t stop when the class bell rings. We can’t overlook the opportunities available to reach kids when the school day ends.

Programs like Discovery Education STEM Camp—which delivers 100% curriculum at no cost to schools, non-profit organizations and parents for use as part of summer camps, after school learning opportunities, and other educational programs—mainly reach students who spend outside traditional learning environments, keeping students inspired and providing them with the tools they need today to compete for the jobs of tomorrow.

What is your advice on using private-public partnerships to tackle our most pressing education challenges in STEM?
Public-private partnerships are an essential element of our collective efforts to support STEM achievement. We need to ignite students’ imaginations, we need to empower them with experiences that demonstrate “why STEM matters,” and we need to support building the life skills that young people need to compete for the jobs of tomorrow.

To that end, we partner with innovative, like-minded organizations such as Siemens, 3M and others to deliver needed resources to educators and students in traditionally underfunded areas like STEM. This includes partnerships with 3M scientists in mentor-match programs and placing classroom teachers in research labs across the country as part of the summer-learning Siemens STEM Academy.

In its home state of Maryland, Discovery also has forged a partnership with Montgomery College, one of the nation’s leading community colleges, to help prepare students for jobs at Discovery and in the fields of information technology and media. This partnership provides students access to paid internships, career panels featuring Discovery executives, and training classes led by Discovery’s HR professionals on networking, resume writing, and interview skills.

It is part of Discovery’s “Discovery Your Skills” initiative, a multimedia public affairs campaign, including the website, DiscoveryYourSkills.com, designed to provide unemployed and underemployed Americans with access to resources for obtaining marketable job skills and expertise, and to raise awareness of career opportunities in skilled trade and other industries.

What counsel would you provide around “collaboration to achieve success” in STEM Education and work force?
The reality is that a growing gap between the needs of employers and the skills of America’s workforce leaves far too many quality jobs unfilled in critical areas of our economy. This is especially concerning for the millions of students who are attending colleges now—and facing the reality that the skills needed by America’s businesses do not always align with those taught at today’s institutions of higher education.

To address this issue, public-private collaboration between universities, community colleges and employers is essential. The types of partnerships ensure that universities and colleges do not train students in a vacuum and that businesses obtain the skilled workforce they need. This collaboration is a critical step to help make students more employable and work ready on day one.
Andrew N. Liveris is the President, Chairman and Chief Executive Officer of The Dow Chemical Company, a global specialty chemicals and plastics company based in Midland, Michigan with 2012 annual sales of approximately $57 billion.

An advocate for the criticality of advanced manufacturing, Liveris serves as Co-Chair of President Obama’s Advanced Manufacturing Partnership, a private-sector-led initiative to revitalize American manufacturing and enhance U.S. global competitiveness. This initiative seeks to identify and address the challenges facing the manufacturing sector, including the STEM skills shortage, which is combating through suggested improvements in high school and community college education.

Liveris is the author of Make It in America, which presents a comprehensive set of practical policy solutions and business strategies for reviving this important sector, including a plan to innovate and retrain the nation’s STEM workforce, and beyond that emphasizes the importance of STEM education. In recognition of his efforts on behalf of science education, Liveris was honored by the Chemical Education Foundation with the Vanguard Award in May 2013.

Liveris sits on the board of directors of IBM and the Special Olympics, is chairman of the U.S. Business Council, vice chair of the Business Roundtable, a member of the President’s Export Council, and was the foreign co-chair of the 2012 China Development Forum. He serves as a trustee for the Herbert H. & Grace A. Dow Foundation, United States Council for International Business, and the California Institute of Technology. A chemical engineering graduate, Liveris continues to support his alma mater as the inaugural chair of the University of Queensland in America Foundation.

Why do you believe STEM Education/workforce development is critical to our nation’s future?

Human capital has historically been one of this nation’s strongest competitive advantages. And in a world where countries are competing like companies, the most educated and most talented workforce is a critical factor for success. To ensure that the U.S. can attract global companies, we need to improve STEM education in this country while simultaneously working to make science sexy again to increase the number of students choosing STEM careers.

Beyond standards, what are the first steps we should take to curb the STEM education crisis?

Addressing the quality of the teachers in our classrooms is the first step towards solving the STEM education crisis in this country. Our nation’s teachers play a crucial role: sparking curiosity and motivating students to explore STEM fields. I experienced this first-hand when inspiring instructors guided me through the tough work of a chemical engineering degree. Unfortunately, many teachers lack the depth of knowledge required to explain science in a way that will engage and inspire students. To bring more STEM-educated teachers into our classrooms, there should be scholarships for students who pursue STEM-related degrees—and who pledge to teach in those fields. STEM-related degrees will provide teachers with the background necessary to explain complex concepts from multiple perspectives and stimulate students.

For our part, Dow has partnered with the National Science Teachers Association (NSTA) to support the development of our nation’s science teachers through the New Science Teachers Academy. This year-long program is designed to enhance teacher content knowledge and confidence through web-based seminars and a mentorship program that pairs participants with trained mentors who teach in the same discipline. Since its inception, the program has graduated more than a thousand teachers throughout the United States.

What are the implications of transforming STEM education in the future workforce needs?

As a major employer of scientific and engineering talent, Dow is central to the development of a 21st century workforce which will help solve society’s most pressing challenges while cultivating a more competitive U.S. marketplace. In 2011, Dow announced a $250 million investment—$25 million per year for 10 years—which is being distributed annually over the next ten years to support breakthrough technological and educational advancements that will help Dow and its partners to improve their workforce quickly and according to their local needs.

Dow’s collaboration with Delta College, just a few miles away from our global headquarters, teaches the case for this approach to Dow and to the nation’s future. This unique and industry-leading investment will support breakthrough technologies and increase collaboration between Dow and key universities, while helping to develop America’s future pipeline of PhD-level talent.

Andrew N. Liveris
President, Chairman and Chief Executive Officer
The Dow Chemical Company

Dow combines the power of science and technology to passionately innovate what is essential to human progress. The Company connects chemistry and innovation with the principles of sustainability to help address many of the world’s most challenging problems such as the need for clean water, renewable energy generation and conservation, and increasing agricultural productivity. Dow’s diversified industry-leading portfolio of specialty chemical, advanced materials, agrosciences and plastics businesses deliver a broad range of technology-based products and solutions to customers in approximately 160 countries and in high growth sectors such as electronics, water, energy, coatings and agriculture. In 2012, Dow had annual sales of approximately $57 billion and employed approximately 54,000 people worldwide. The Company’s more than 5,000 products are manufactured at 188 sites in 36 countries across the globe.

As a chemical engineer by trade, I have always been struck by the ways in which chemistry can be applied to solve problems. Today, I am more convinced than ever that the chemical sciences are elemental to enabling the intersection of humanity with our planet. With the global population expected to balloon to 9 billion people by 2050, challenges such as clean water, affordable medicine and sustainable housing need to be addressed. That is why we must help this next generation of chemical engineers and scientists to innovate and solve these problems in a way that protects—and even improves—our quality of life on this planet.

What is your advice on using public-private partnerships to tackle our most pressing education challenges in STEM?

Corporations like Dow, which depend on a robust talent pipeline of skilled workers, have a responsibility to invest their resources and expertise in improving STEM education in the United States. However, the scope of this challenge is too large for any one stakeholder to solve alone. For this reason, industry must come together with government, educators and non-profits in a “golden triangle of partnership” to create programs that encourage the highest quality K-12 and continuing education to fill the talent pipeline. Organizations like the Chemical Education Foundation (CEF) rely on such partnerships to provide programs that enhance education. That is why Dow has committed to support CEF’s You’re the Chemist Challenge, an initiative that engages fifth through eighth grade students in learning about chemistry concepts, discoveries and chemical safety. Announced in 2011, this commitment will enable CEF to announce You’re the Chemist Challenge to 30 states by 2014.

What do corporations need to do to create more STEM careers and fill existing jobs?

By 2020, the Boston Consulting Group has predicted that manufacturing renaissance underway in this country will generate as many as 5 million jobs across the economy. Most of these high-skill, high- paid positions will require a STEM background, but an insufficient pool of STEM talent is threatening to leave these jobs unfilled. To remedy this, corporations must come together with government and civil society to solve alone. For this reason, industry must come together with government, educators and non-profits in a “golden triangle of partnership” to create programs that enhance education. That is why Dow has committed to support CEF’s You’re the Chemist Challenge, an initiative that engages fifth through eighth grade students in learning about chemistry concepts, discoveries and chemical safety.

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What are the areas of STEM you are most passionate about?

Andrew N. Liveris
President, Chairman and Chief Executive Officer
The Dow Chemical Company

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Ann Drake is Chairman and CEO of DSC Logistics. Since becoming CEO in 1994, she has guided DSC through transformations aimed at preserving supply chain leadership to customers with changing needs. She and her team have led the implementation of a series of structural and strategic initiatives resulting in a focus on integrated supply chain solutions and a business model based on collaborative partnerships.

In emphasizing the importance of talent development, Ms. Drake has actively promoted the inclusion of both men and women in rising to positions of leadership. DSC customers include Kellogg, Cardinal Health, The J.M. Smucker Company, Georgia Pacific, Kraft, Kimberly-Clark, and other leading companies in a variety of industries.

Ann serves on the Boards of the Metropolitan Planning Council, the Committee of 200, and the A.M. Castle Company. She is Vice Chairman of the Business Advisory Council of the Transportation Center of Northwestern University. She also serves as a strategic leader in transportation and infrastructure on Chicago Mayor Rahm Emanuel’s World Business Chicago Economic Growth Plan.

Ann received the Distinguished Service Award from CSCMP and the Alumni Merit Award from the Kellogg School, and was named “Industry Leader of the Year” by IIIE. Her undergraduate degree is from the University of Iowa and her MBA from The Kellogg School at Northwestern University.

How do we encourage students to continue their STEM studies, particularly women and underrepresented minorities? Develop more internship, mentoring and co-op programs. As an example, at DSC our engineering group partners with Northwestern University on an industrial engineering co-op program and with Michigan State University on packaging engineering and VAS co-op programs. We offer internships in our supply chain, solutions and IT groups. Market and educate about the value of education in STEM subjects. Do a better job of showing what you can do with a STEM education.

What do corporations need to do to create more STEM careers and fill existing jobs? In terms of STEM careers in supply chain management, more corporations need to create career paths for engineers and other supply chain professionals, blending business intelligence and expertise in the discipline. An enlightened company would then welcome an employee with a strong STEM education and help him/her develop the skills in communication and leadership, and the business knowledge necessary for advancement.

Of what STEM initiative that your company has supported are you most proud? At a symposium in May, we announced a new initiative to increase women’s leadership in logistics and supply chain management. The initiative recognizes the contribution of women leaders to the field and promotes the development of up-and-coming leaders. The initiative is named AWESOME—Advancing Women’s Excellence in Supply Chain Operations, Management and Education.

Over the past 10 years, the field of supply chain management, including logistics, procurement, supply management, and sourcing, has transformed. The pace of business has accelerated, the economic consequences of moving products through global markets have multiplied, and new technologies is being developed and adopted at warp speed. The field is now recognized as one with tremendous power to help companies achieve their business goals. With increasingly complex problems to be solved and constantly-changing needs to be addressed, the role of strategic supply chain leaders is expanding dramatically.

“In an industry once thought to be mainly about moving boxes and driving trucks, critical elements of success now include creative problem solving, information sharing, and long-term partnerships. In this environment, women have a natural and vital role as team members and leaders. Yet, too few women are fulfilling top leadership roles in supply chain management. Our goal is to change that and bring new energy and new talent to our profession.”

What do you see as the biggest area of opportunity in advancing STEM jobs/careers? It might be in the area of inter- or cross-disciplinary education. The supply chain management field offers career positions in engineering, process improvement, solutions, IT, continuous improvement—all based on STEM education. Data, analytics, problem solving, strategic thinking etc. all form the building blocks of our service to our customers. In addition to a strong education in STEM subjects, a supply chain professional needs skills in collaboration, relationship building, communication, business. A college program that guides a student through identifying what career path he/she wants to take should also include courses/guidance is what it takes to be successful, what skills you need, how to use your knowledge/training in the career.

What is your advice to those involved in promoting STEM education? Start even earlier (as early as possible, before high school) to show young people what careers they can pursue with STEM education so they can take a full array of math and science classes in high school and beyond. By high school, many are already down a path. Do profiles of engineers doing exciting jobs. Educate more about what an engineer does, what a supply chain professional does, for example. Make math and science “cool” or maybe it’s more accurate to say emphasize the “coolness” of the “tech gurus” who are parlaying their expertise into success. As one of my colleagues says, “Smart people follow the money and the “cool kids.” Establish internship programs for students younger than college age.

How should those working to improve the STEM workforce measure success? In the logistics field, measuring of success should be based on both top line and bottom line growth. STEM training developed into business intelligence shows existing customers how to change and prospective new customers what a logistics partner can do to help them solve problems and drive out costs in their supply chains.
Jim Rogers serves as chairman, president and chief executive officer of Duke Energy. He is currently in his 25th year as a CEO in the electric utility industry. Rogers was named president and CEO of Duke Energy following the company’s merger with Cinergy in 2006, and continued in that role following the merger with Progress Energy in 2012. He served as Cinergy’s chairman and CEO for more than 11 years, and prior to that, as chairman, president and CEO of PSI Energy.

Rogers has served as deputy general counsel for litigation and enforcement for the Federal Energy Regulatory Commission (FERC); executive vice president of interstate pipelines for the Enron Gas Pipeline Group; and as a partner in the Washington, D.C., law office of Alkin Gump Strauss Hauer & Feld. Prior to those appointments, Rogers worked as assistant to the chief trial counsel at FERC; as a law clerk for the Supreme Court of Kentucky; and as assistant attorney general for the Commonwealth of Kentucky, where he advocated for the state’s consumers in gas, electric and telephone rate cases. Rogers was also a reporter for the Lexington (Kentucky) Herald-Leader for three years.

Under Rogers’ leadership, Duke Energy has been recognized as a leader in sustainability—balancing the “triple bottom line” of people, planet and profits. In 2010 and 2011, the company was named to the elite Dow Jones Sustainability World Index; it has been a part of the Dow Jones Sustainability Index for North America for the past seven years.

He earned his bachelor’s and law degrees from the University of Kentucky, and lives in Charlotte, N.C.

Duke Energy

Duke Energy is the largest electric power holding company in the United States with more than $110 billion in total assets. Its regulated utility operations serve approximately 7.2 million electric customers located in six states in the Southeast and Midwest. Its commercial power and international business segments own and operate diverse power generation assets in North America and Latin America, including a growing portfolio of renewable energy assets in the United States.

The company actively supports STEM education and teacher development because each are key focus areas in growing the future energy industry workforce—especially because of the new skills needed for the renewable energy industry and the advancements of digital grid technology.

How do we encourage students to continue their studies of STEM, particularly women and underrepresented minorities?

It’s easy for us to speak about the benefits of a STEM education. But I think the real drivers are the teachers. Those who teach students every day, and they have the ability to really embed STEM in everything they say and do. That’s why we’re involved in a few projects that offer STEM educational development programs for teachers from all types of schools. These programs use the best of what’s known about these subjects to help educators develop the skills, knowledge and resources they need to become effective practitioners in their classrooms.

What do corporations need to do to create more STEM careers and fill existing jobs?

Partnerships are key. Like others, we continue to develop alliances to build a pipeline of energy workers. One way we do this is by partnering with line worker academies and nuclear operator programs at community and technical colleges. We provide programmatic support through funding, equipment, instructors, curriculum development, scholarships and employment opportunities for graduates.

We also join forces with universities to develop the next generation of energy expertise. For instance, our foundation gave $4.5 million to support UNC Charlotte’s Energy Production and Infrastructure Center, which is focused on training new engineers and conducting research in energy technologies. The center will eventually be an educational resource for engineering students from many universities and colleges, and a national laboratory for cutting-edge technologies that will shape our industry.

Duke Energy is also aligned with the Center for Energy Workforce Development (CEWD) to pilot the Get Into Energy Career Pathways program. The CEWD is working through state Energy Workforce Consortia—partnerships of energy companies, educational institutions, and state labor departments and workforce agencies. The intent of the program is to hire and train 500 low-income young adults for energy-related careers by the end of this year.

Duke Energy is supporting this program by offering employment, training and opportunities for career advancement to selected participants in our service areas.

How has your corporation coordinated investments in education with future workforce needs?

We’re able to take a macro view of the characteristics of our workers, and then identity future trends. For instance, well over half of Duke Energy’s workforce is made up of “traditionalists” and “baby boomers” who will be considering retirement in the next decade or so. Our workforce planning groups continually monitor the company’s demographics, forecasting areas in which the company will need to recruit new hires, based on changes in demographics and required skills.

This is how we really got going with STEM years ago. We took a hard look at our workforce and saw a need. Then we saw a major gap when we looked at forecasts for future energy workers. This prompted us to become very proactive in terms of programs that sustain and promote STEM education.

We definitely see the value in our work beyond just building a pipeline of workers. It makes a difference in our communities, too. We know that good workers tend to be more active and engaged in their communities. So it really comes full circle.

What is the key to smart STEM investments?

I think investments have to vary. For instance, some companies can get so caught up in external STEM programs that they forget about their own workforce pipeline—like the “Generation X” and “Millennials” that you already have on staff. These employees are from a different generation. They don’t necessarily want to spend their entire careers in one industry or with one company. That’s why we need to work hard to retain employees, and a reason why we need to remain competitive in terms of benefits.

We also need to continue to develop these employees to fill the shoes of others who may retire. Duke Energy encourages employees to continue their education. And we help out with financial support. We’ve found that this pursuit of educational opportunities contributes to employee development and morale, as well as organizational growth.

What do we need in the U.S. to continue to be at the top of global innovation?

The U.S. and American companies have a lot of work to do to keep their place at the top of global innovation. First, we must embrace the work that other countries are doing—and do it better. Duke Energy has many partnerships in China. Why China? Well, the Chinese are on a building spree in terms of power plants. They are fast building hundreds of coal-fired plants and more than 20 nuclear plants. Plus, China is building more wind and solar generation this year than many U.S. utilities have in their entire fleet. And we’re along with them the entire way. Being plugged into this effort is a great way to learn lessons, avoid mistakes and bring that knowledge back to benefit our customers in the Americas.

The second thing we need to do is to work harder to retain human capital in the U.S. Tens of thousands of international students come to our country for undergraduate and graduate studies, only to apply their intelligence overseas. We need to try harder to keep these brilliant minds in the U.S.
Ellen Kullman, 57, is chair of the board and chief executive officer of DuPont. She is the 19th executive to lead the company in more than 208 years of DuPont history. As CEO, Ellen has championed market-driven science to drive innovation across the company’s businesses. Under her leadership, decision-making has moved closer to customers around the world, resulting in greater partnering, collaboration and engagement with customers within and beyond duPont’s businesses. Under her leadership, decision-making has moved closer to customers around the world, resulting in greater partnering, collaboration and engagement with customers within and beyond duPont’s businesses.

Ellen Kullman began her career at DuPont in 1988 as a marketing manager. She served as business director for several businesses including White Pigment & Mineral Products where she became vice president and general manager in 1995. She assumed leadership of two high-growth businesses, DuPont Safety & Protective Materials in 1998 and Bio-Based Materials in 1999. She was named group vice president - DuPont Safety & Protection in 2002. In 2006, she was named executive vice president with responsibility for three business platforms and several functions including Marketing & Sales. In 2008, she was tapped to lead the company’s focus on growth in emerging international markets.

She is a member of the U.S.-India CEO Forum, the Business Council, and the executive committee of SCI-America. She is co-chair of the National Academy of Engineering Committee on Changing the Conversation: From Research to Action. Ellen is on the board of trustees of Tufts University and serves on the board of overseers of Tufts University School of Engineering. She is a board member of Change the Equation, a national coalition of industry leaders who have pledged to foster widespread literacy in science, technology, engineering and mathematics (STEM) that sparks an innovative spirit in students and prepares them for postsecondary options. Prior to joining DuPont, Ellen worked for General Electric. She holds a bachelor of science degree in mechanical engineering from Tufts University and a masters degree in management from Northwestern University.

 Why do you believe STEM Education and Workforce are important to our nation?

The backbone of America’s economy is innovation and the heart of innovation is science. Scientists and Engineers are problem solvers that make good ideas into realities, and technologists help us drive innovations with speed and adaptability. From astronauts to social media, from Kevlar® to the NFL—STEM careers are everywhere. At DuPont, we are working to address the big challenges facing our world today. The increase in population, a growing global middle class and finite natural resources are challenges that we believe can be solved through collaborative science. No one company or organization can do this alone, we will need the help of others. DuPont has a history of transforming markets and creating lasting solutions to big challenges. We continue our efforts today and believe STEM will be a big part of how we are successful.

 What traits do senior leaders need to effectively support and advance STEM today?

Many leaders have STEM backgrounds so it’s easy to start with what we know—how we use STEM in our lives. But we also need to help students see how versatile STEM is. We need to get involved and be collaborative, working with parents, teachers, schools and government to help address this important challenge for America. We also need to be creative in our efforts. Today’s students have different ways of communicating and different priorities. We need to listen to them and learn how we can best reach them. We need them to believe and care that STEM education is important to our future workforce and national competitiveness. The path to STEM education starts early, before kindergarten, and we need to engage throughout the education process, not just at the college level.

What about STEM gives you passion?

At DuPont, we have been a supportive of education and the evolution of education as new methods and content are developed since our founding in 1802. Today I’m proud of what we do for students and how we help teachers teach through inquiry based curriculum, seminars and learning experiences. I am proud of the Changing the Conversation report with the National Academy of Engineering. Every year, hundreds of millions of dollars are spend in the United States to improve the public understanding of engineering. Despite these efforts, research shows that K-12 teachers and students generally have a poor understanding of what engineers do. Changing the Conversation seeks to create a better understanding of the power of engineering. Engineers are the partners of scientists. They take experiments from the labs to the marketplace. I love the work we do at DuPont, and I believe that we have a history of improving people’s lives. If you are someone who is a problem solver, then a career in science is for you. Solvers have such a critical role in the work we do globally. And solvers started as kids with interests in science, technology, engineering and math.

“...it is fun when you see that light bulb go off and you know you’ve helped someone see STEM in a different way.”
John C. Lechleiter, Ph.D.
President and Chief Executive Officer
Eli Lilly and Company

Eli Lilly and Company has been in business since 1876. The global, research-based company was founded by Colonel Eli Lilly—a pharmaceutical chemist and a veteran of the U.S. Civil War—in Indianapolis, Indiana.

For well more than a century, Lilly employees have worked to discover and develop important medical breakthroughs.

To continue to innovate, it’s imperative to improve student performance in math and science. Lilly has been a leader in strengthening science education for K-8 students through the Indiana Science Initiative. Approximately 120 schools—representing over 1,900 teachers and over 60,000 students are signed up to participate in this initiative over the next six years. Lilly has also deployed 140 employees to serve as “science coaches” in the 2012/13 school year.

In 2001, Lechleiter was appointed executive vice president for pharmaceutical products and corporate development. In 2004, he became Lilly’s executive vice president for pharmaceutical operations. And in 2005, he was named president and chief operating officer and joined the board of directors.

Lechleiter received a bachelor of science degree in chemistry from Xavier University in 1975. He subsequently studied organic chemistry as a National Science Foundation Fellow at Harvard University, where he received his master’s and doctorate degrees in 1980.

Lechleiter is a member of the American Chemical Society and Business Roundtable. He serves as chairman of the Pharmaceutical Research and Manufacturers of America (PhRMA), as president of the International Federation of Pharmaceutical Manufacturers & Associations (IFPMA), and on the boards of United Way Worldwide, Xavier University, and the Life Sciences Foundation.

Why do you believe that STEM Education/workforce development are critical to our nation’s future?

We live in a globally integrated, knowledge-based economy, and the most important ingredient for prosperity is innovation. Key to our ability to innovate is significantly improving student achievement in math and science. Our current performance relative to other nations must be a call to action: comparative data suggest that the U.S. is only in the middle of the pack. We must do better or the economic headwinds our country faces will only intensify.

How do you believe STEM education can improve a nation’s competitiveness?

Innovation will drive our economy in the 21st century, and we will need a workforce and society of large prepared to help our country realize the opportunities before us. This starts with education. Basic comprehension of math and science is essential so that young people have an opportunity to participate at any level in the high-tech economy of the future. Further, as the technology sector grows and the baby boom generation retires, we’ll need a large cohort of people with basic scientific skills to fill in behind their parents and grandparents.

This is not just about improving K-12 education to have more students ready for a 4-year college STEM degree, but also working to ensure that young people have access to high-quality vocational training as another avenue for participation in the modern economy we must continue to build.

If we don’t step up to meet these challenges, we’ll have key shortages in important fields, providing a drag on economic growth and our nation’s competitiveness.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

All adults, especially teachers, parents, and mentors, must foster excitement in young children about the wonders of science. All kids are naturally curious, and we should encourage them to explore and ask big questions. And, no one should be excluded. Minorities, girls, kids of all backgrounds, can learn and excel in math and science, and we must identify and eliminate any barriers that discourage them from studying these wondrous subjects. We can’t wait until kids are in high school to do this. We must start earlier, and that has guided much of our thinking on STEM related programming.

What STEM initiative that your company has supported are you most proud?

In our home state of Indiana, Lilly has been a lead partner in strengthening science education for younger kids (K-6) through the Indiana Science Initiative (ISI). ISI is based on research supporting the benefits of inquiry-based instruction, which allows students to explore and problem solve to develop deep knowledge and understanding of concepts. In the classroom, students are engaged and excited as they work on science explorations independently and in collaboration with their peers.

Results of an early ISI pilot were positive and now, with 120 K-8 schools representing over 1,900 teachers and over 60,000 students are signed up to participate in ISI over the next six years. K-8 teachers will participate in professional development that will train them to provide science instruction using research-based instructional materials enhanced with literacy education. Schools participating in ISI will continue to receive support for professional development, science kit materials management, assessment, and community advocacy. Lastly, teachers and students will participate in an evaluation study that will document the impact of ISI. We are hopeful that the results will drive greater investment and replication.

Lilly is also supporting the ISI by providing employees to serve as “science coaches.” These skill-based volunteers assist teachers in hands-on learning essential to the ISI. In the 2012/13 school year, Lilly deployed 140 science coaches into Indiana classrooms.

What counsel would you provide around “collaboration to achieve success” in STEM Education and workforce?

In general, we believe what is needed is a collective effort to develop new generations of Americans who are scientifically and mathematically literate out of which we can inspire and train some to become our future scientists and engineers. This will require effective interventions on a number of levels. This will go beyond the scope of any one organization, so effective collaborations are, by definition, essential. In my judgment, the main thing is to ensure that the collaborations are relentlessly focused on driving measurable results, and that they align resources and advocacy efforts behind what is working.
Stephen R. Howe, Jr.
Americas Managing Partner
Ernst & Young LLP

Ernst & Young is a global leader in assurance, tax, transaction and advisory services. Worldwide, our 167,000 people are united by our shared values and commitment to quality. We make a difference by helping our people, clients, and our wider communities achieve their potential. As an organization that bases our business on sharp analytical skills, we offer diverse career opportunities to STEM-educated professionals. In 2013, we will hire more than 10,000 people from campus and industry, many with degrees in accounting, engineering, finance, mathematics and technology. In addition, our organization has a strong commitment to STEM education. Our Academic Resource Center develops time-critical learning materials for university faculty. Many of our corporate responsibility initiatives aim to strengthen education and build STEM skills. For example, we are a sponsor of Cyberchase, the PBS award-winning series that teaches math and problem-solving. Our professionals bring those lessons to life through the Cyberchase Volunteer Program.

Beyond Standards, what are the first steps we should take to tackle the STEM education crisis?

The STEM concentrations are those that emphasize analytical thinking. We need to support analytical thinking and its tie to economic growth throughout a robust K-12 curriculum, but we need to also strengthen the connection between classroom learning and the outside world. Volunteer engagement in our schools can make a huge difference. Every year, thousands of business people volunteer their time through not-for-profits like Junior Achievement and the Network for Teaching Entrepreneurship, and by doing so, encourage students to build skills and embrace learning. We can also strengthen post-secondary STEM learning through the community college and university systems by supporting scholarships, internships, mentorships and auxiliary support learning in those areas.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

Role models and mentors play an important role in encouraging women and under-represented minorities to continue their study of STEM subjects. This starts at a young age. Cyberchase, the Emmy® award-winning PBS television series, helps build the math and problem-solving skills of children ages 8-11 and was specifically designed to engage girls and minorities. Ernst & Young professionals bring the Cyberchase concepts to life when they visit after-school programs and lead hands-on learning activities our US firm co-developed with the PBS. At the high school level, mentors, like those in our Ernst & Young College MAP (Mentoring for Access and Persistence) program, offer exposure to career opportunities in STEM fields and serve as role models.

How has your corporation coordinated investments in education with future workforce needs?

The Ernst & Young Foundation’s Academic Resource Center (ARC) has provided free university teaching materials for all collegiate level professions in topical areas that are important to public and private sectors. By bringing together academics and professionals to co-develop free, state-of-the-art curricula in topics important to the workforce but, perhaps unfamiliar to academics, we can help ensure graduates are as prepared as possible for the increasingly complex world they are entered.

Another area where we have made a coordinated investment is our support for college access for disadvantaged youth, including our College MAP (Mentoring for Access and Persistence) program. Today, 30% of students in the bottom quartile of incomes enroll in a four-year school and among that group, fewer than half graduate. Helping these young people apply to college and prepare for success is critical to filling the current skills gap.

What is your advice on using private-public partnerships to tackle our most pressing education challenges in STEM?

Our experience is that when each partner tackles the piece where it has a competitive advantage, the outcomes are more robust and participants are more satisfied. The corporate sector brings professionals with deep technical skills and volunteers with passion and energy; we also have the most recent market intelligence because that is where we spend our time. Universities have advantages with pedagogy and in understanding what students need in theory to get the most from their professional experiences. And government has the ability to set standards and the channels—through the millions of public schools across the US—to drive change on a large scale. Understanding the demands on the time and pressures on all parties helps to make efficient and effective timelines and outcomes.

How is your company connecting diversity initiatives with STEM initiatives? Is this a part of your comprehensive strategy?

One strong point of connection between our STEM initiatives and our commitment to diversity is our inclusiveness recruiting strategy. We work very hard to build awareness of the profession and opportunities in STEM. We fund High School Programs throughout the US where diverse students attend college for a week to learn about accounting careers. Through the EY Launch Internship program we’re able to encourage talented minority college students to pursue STEM careers by introducing them to the diverse opportunities available to them at Ernst & Young as early as the summer following freshman year. More than 210 students will serve as Launch interns this year.
George Paz drives Express Scripts’ strategic direction to ensure alignment with clients to deliver better, more cost-effective health outcomes for millions of people. George joined Express Scripts in 1998 as senior vice president and chief financial officer and became president in 2003. In 2005 he was named chief executive officer and the following year was elected chairman of the board. He currently serves as a member of the board of directors for Honeywell, Inc. George holds a bachelor’s degree in business administration and accounting from the University of Missouri - St. Louis and is a member of the American Institute of Certified Public Accountants.

George Paz
Chairman and Chief Executive Officer
Express Scripts

As America’s leading pharmacy benefit manager, Express Scripts manages more than a billion prescriptions each year for tens of millions of patients. On behalf of our clients—employers, health plans, unions and government health programs—we make the use of prescription drugs safer and more affordable. Express Scripts uniquely combines three capabilities—behavioral sciences, clinical specialization and actionable data—to create Health Decision Science, our innovative approach to help individuals make the best drug choices, pharmacy choices and health choices. Better decisions mean healthier outcomes.

Investing in STEM Today to Improve Healthcare

Every day, millions of American families count on Express Scripts to provide the prescription drugs they need to stay healthy and live better. We have worked hard to earn the privilege to play such an important role in American healthcare and we take our responsibility seriously.

We continually work to improve healthcare, helping people make better decisions and achieve healthier outcomes. There’s no doubt that having a rich understanding of science, technology, engineering and mathematics (STEM) is a central component to how we make the use of prescription drugs safer and more affordable.

At its core, Express Scripts is a technology company that applies science and engineering to healthcare’s challenges. We have built an innovative culture led by those who can evaluate the challenging healthcare landscape, find opportunities to improve patient care and then discover, develop and deploy novel solutions to our clients—the companies, health plans, unions and government agencies that provide pharmacy benefits to more than 100 million Americans.

We significantly invest time and money to ensure that science, technology, engineering and mathematics are not only core competencies of our current employee population, but that the future leaders of our company are also well skilled in these important areas of study.

With thousands of pharmacists, nurses and medical professionals, our deep clinical specialization helps us to identify gaps in care for patients. This scientific and medical expertise goes even further, allowing us to appropriately intervene, become trusted advisors to physicians and make a real difference in the lives of millions of people. Clinical rigor is our calling card. We are constantly evaluating prescription drugs to make sure people get the most cost-effective treatments to get them back on track as we reduce waste, lower costs and improve patient outcomes across healthcare.

At Express Scripts, STEM is shorthand for what we’ve made us successful over the past 25 years. To grow in the future and help clients and patients navigate through an even more complicated healthcare landscape, we need a workforce that is not just fluent in STEM, but is world-class in each specific component of STEM. From our pharmacy, to our facilities in the future and help clients and patients navigate through an ever more complicated healthcare landscape, we need a workforce that is not just fluent in STEM, but is world-class in each specific component of STEM. From our pharmacy, to our facilities in the future and help clients and patients navigate through an ever more complicated healthcare landscape, we need a workforce that is not just fluent in STEM, but is world-class in each specific component of STEM. From our pharmacy, to our facilities

We are proud to partner with organizations and fund efforts to expand STEM education. Like any company, we look to the return on investment with every capital allocation we make. By investing in human capital, STEM education and the workforce of tomorrow, the return on investment is clear. Improving healthcare is a mission that appears straightforward enough, but the process is complex and the collective commitment to STEM from private industry and government is non-negotiable. We know healthcare will continue change and we understand what is critical to make sure every American has access to the prescription drugs they need to live a better life. Investing in STEM today ensures that we can be successful tomorrow.

“By investing in human capital, STEM education and the workforce of tomorrow, the return on investment is clear…”
A native of Wichita Falls, Texas, Rex Tillerson earned a Bachelor of Science degree in civil engineering at the University of Texas at Austin, before joining Exxon Company, U.S.A. (EUSA) in 1975 as a production engineer.

In 1989, he became general manager of EUSA’s central production division, responsible for oil and gas production operations throughout a large portion of Texas, Oklahoma, Arkansas and Kansas.

In 1992, Mr. Tillerson was named production advisor to Exxon Corporation. Three years later he was named president of Exxon Yemen Inc. and Esso Exploration and Production Khorat Inc., and in January 1998, became vice president of Exxon Ventures (CIS) Inc. and president of Exxon Neftegaz Limited. In those roles, he was responsible for Exxon’s holdings in Russia and the Caspian Sea as well as the Sakhalin-1 consortium operations offshore Sakhalin Island, Russia.

In December 1999, he became executive vice president of ExxonMobil Development Company. Mr. Tillerson was named senior vice president of Exxon Mobil Corporation in August 2001, and was elected president of the corporation and member of the board of directors on March 1, 2004. He assumed his current position on January 1, 2006.

Mr. Tillerson is a member of the executive committee and is a former chairman of the American Petroleum Institute. He is also a trustee of the Center for Strategic and International Studies. He is a member of the National Petroleum Council, chairman of the Business Roundtable’s Education and Workforce Committee, an honorary trustee of the Business Council for International Understanding, and a member of the Emergency Committee for American Trade.

Mr. Tillerson is the vice-chairman of the Ford’s Theatre Society, immediate past national president of the Boy Scouts of America, and a former director of the United Negro College Fund. He is also a member of the Chancellor’s Council and the Engineering Advisory Board for the University of Texas at Austin and the Society of Petroleum Engineers.

Why do you believe STEM Education/workforce development are critical to our nation’s future? ExxonMobil’s success as a U.S. company in a global economy depends on the quality and ingenuity of our workforce, and we are certainly not alone. Unfortunately, if the next generation of U.S. workers lacks the skills to solve the problems of the future, it’s not just U.S. leadership in energy that’s at risk—it’s also our leadership in medicine, research, technology and other pillars of the American economy. For the United States to remain competitive globally, we must ensure all children, no matter where they live, are provided the best education possible and are prepared for work or college when they finish high school.

How do you believe STEM education can improve a nation’s competitiveness? The evidence is clear: 60 percent of new jobs this century will require math and science skills, but only 20 percent of the workforce have these skills today. In 2009, the Program for International Student Assessment ranked U.S. students 17th in the world in science and 28th in math. Our nation’s students must be prepared to compete in a 21st century global economy to ensure American innovation and a robust economy.

Beyond Standards, what are the first steps we should take to curb the STEM education crisis? Students won’t excel without great teachers to challenge and prepare them for college and career success. A critical component in raising the bar on math and science education is providing high-quality professional development for current teachers, as well as recruiting and preparing a new corps of motivated and gifted math and science teachers.

The ExxonMobil-supported National Math and Science Initiative (NMSI) has trained more than 60,000 teachers across the country through its AP program. NMSI’s hallmark teacher preparation program at the university level, UTeach, is working to build the quality of our future teacher corps, and it is estimated that nearly 4 million students will learn from UTeach teachers by the year 2020.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities? Access to science, technology, engineering and mathematics education must be made widely available, particularly to women and minorities in the United States. It’s also critical that we shift societal perception about who can be a STEM leader. ExxonMobil continues to support the Hispanic Heritage Foundation, United Negro College Fund, American Indian College Fund, National Society of Black Engineers, Society of Women Engineers, Society of Hispanic Professional Engineers and the National Action Council for Minorities in Engineering.

What counsel would you provide around “collaboration to achieve success” in STEM Education and workforce force? Collaboration is critical on two levels: among the organizations working toward a common mission, and among the businesses, teachers and parents who are building a collective movement to take action against America’s declining standards. At its core, ExxonMobil is a company of problem solvers, but no one organization or company can address this issue alone. It requires a collective effort, and we are proud to play our part by partnering with leaders in the field and advancing programs that make a difference. As a result, we have helped impact tens of thousands of students, teachers and classrooms across the country.

“Access to science, technology, engineering and mathematics education must be made widely available, particularly to women and minorities in the United States.”

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ExxonMobil
How do you believe STEM education can improve a nation’s competitiveness?
In the last century, the economy was mostly driven by natural resources and manual labor. The economy of the future will be driven by knowledge and ideas. Science, technology, engineering, and math are going to be really important for everyone in this future, so we continue having great new companies and products that create more jobs and growth. But I also think technology gives us this amazing chance to solve fundamental problems that we’re facing as a society and affect people’s lives every day. Getting the right skills and training will help us solve these challenges and improve things for everyone.

What area of STEM are you most passionate about?
Because of my education, I was able to build a company at an early age, and today I get to work with amazing people every day. STEM education is a way of empowering people, and making sure that everyone gets a chance to share the opportunities today.

What do we need in the US to continue to be at the top of global innovation?
Immigration reform is an important first step. Earlier this year I started teaching a class on entrepreneurship at a middle school in my community. The kids in my class were really smart and hardworking, and they should be a part of our future. But the current system blocks them—some students thought going to college or even high school was impossible because of their legal status. If we want to build an economy for the future, we should help these kids reach their full potential. They are tomorrow’s leaders.

How is your company connecting diversity initiatives with STEM initiatives?
Facebook works with a number of organizations to encourage more women to stay in STEM—we do events with Girl Geeks and Girls in Tech, and we also offer scholarships every year for female college students to attend the Grace Hopper conference. We’ve also taken part in the State Department’s TechWomen initiative, mentoring students from Jordan, Egypt and Morocco.

“...some students thought going to college or even high school was impossible because of their legal status. If we want to build an economy for the future, we should help these kids reach their full potential. They are tomorrow’s leaders.”
Alan Mulally is president and CEO of Ford Motor Company, and a member of the company’s Board of Directors.

Prior to joining Ford in September 2006, Mulally served as executive vice president of The Boeing Company, and president and CEO of Boeing Commercial Airplanes. Mulally joined Boeing in 1969 and progressed through a number of significant engineering and program-management assignments, including contributions on the 727, 737, 747, 757 and 767 airplanes and serving as vice president and general manager of the 777 program.

Throughout his career, Mulally has been recognized for his contributions and industry leadership, including being named “Businessperson of the Year” by the readers of Fortune magazine, “Industry Leader of the Year” by Automotive News magazine, one of “The World’s Most Influential People” by Time magazine, and “Person of the Year” by Aviation Week magazine.

Mulally holds Bachelor and Master of Science degrees in aeronautical and astronautical engineering from the University of Kansas, and earned a master’s in management from the Massachusetts Institute of Technology as a 1982 Alfred P. Sloan fellow.

How do you believe STEM education can improve a nation’s competitiveness?

Ford Motor Company understands that our nation’s global competitiveness depends on the ability of our educational systems to prepare a 21st century workforce that is able to innovate, creating new products and services that meet global customer needs and make the world a better place. It is clear that maintaining our productivity as a country depends in large part on developing scientists, engineers, entrepreneurs, technical specialists and other professionals with the relevant skills necessary to innovate and compete on a global stage. We are fighting for the soul of American manufacturing! Manufacturing is vital to the future of our country because it is a part of the solution to economic growth, energy independence and environmental sustainability. Our ability to serve customers with a full family of vehicles delivering the very best quality, fuel efficiency, safety and value depends on a skilled and motivated team dedicated to continuous improvement.

What do corporations need to do to create more STEM careers and fill existing jobs?

Our One Ford plan is working and we are profitably growing in the U.S. Our aggressive pace of new vehicle introductions has led to the ongoing hiring of 2,200 salaried workers in such key areas as product development, manufacturing and IT in the U.S. this year. Continued investment in R&D is a primary driver of competitiveness and creating STEM jobs. We support STEM-related student teams and research projects from elementary to postgraduate schools to aid in the development of a skilled and motivated workforce for the automotive industry.

What are the STEM initiatives that your company has supported that have made you most proud?

Ford Next Generation Learning (Ford NGU) mobilizes educators, employers and community leaders to develop a new generation who will graduate career-ready. Ford NGU improves teaching and learning, promotes the development of career- and interest-themed high schools to better serve students, and aligns business and civic engagement in education to improve student and workforce outcomes.

- Ford Partnership for Advanced Studies (Ford PAS) is an innovative high school curriculum that equips students in high-demand fields such as engineering, alternative energy and business, providing students with the critical skills they need to succeed in college and the workplace. This program currently reaches more than 100,000 students in 27 states.
- Ford has replicated its award-winning small high school model to create a network of four Henry Ford Academies in Dearborn, Detroit, San Antonio and Chicago. Students at these schools benefit from the new HFA Model Curriculum, which is thought to be the first in the nation to focus explicitly on innovation and creativity.
- Ford Blue Oval Scholars is a national web-based initiative that links the hundreds of winners of Ford scholarships awarded each year together with each other and Ford via an online portal. The initiative also sponsors an annual Heart Behind the Oval scholarship contest that rewards students making a difference in their communities.
- The Ford College Community Challenge (Ford C3) challenges Ford’s national college partners to work with their local communities to create innovative, student-led projects that utilize the school’s resources to address a social need in the local community. Proposals must address the issue of alternative energy and its role in building a sustainable community. Five winning proposals are selected each year and provided with funding to implement their community project.
- Ford Community Corps is a network of colleges and universities that work with Ford to create new service learning initiatives—Ford Community Corps programs—that recognize scholastic achievement while encouraging service to the community. Ford Community Corps programs seek to match student know-how with specific non-profit needs. As a part of the program, college students, or teams of students, are connected to work-related projects created by local non-profit organizations.

What do we need in the U.S. to continue to be at the top of global innovation?

We need to develop more STEM talent within the U.S. and also attract the best and brightest STEM talent globally to employment in the U.S. and with U.S. companies. We need to continue to grow our collaborative R&D with universities working together at the technology frontier. Finally, we need globally competitive tax policies that will position U.S. businesses to continue to innovate by investing in R&D.

What counsel would you provide around “collaboration to achieve success” in STEM education and workforce?

The most important thing is that we work together in partnership with students, educators, industry, government and business. For our current workforce, continued up-skilling is critical to maintaining our competitive performance. Existing federal training programs should be flexible, work closely with States, and prioritize incumbent worker training. Together we can create great jobs and careers and ensure the future of American manufacturing.
Richard C. Adkerson
President and Chief Executive Officer
Freeport-McMoRan Copper & Gold Inc.

Freeport-McMoRan Copper & Gold Inc. (FCX) is a leading international mining company with headquarters in Phoenix, Arizona. FCX operates large, long-lived, geographically diverse assets with significant proven and probable reserves of copper, gold and molybdenum. FCX has a dynamic portfolio of operating, expansion and growth projects in the copper industry and is the world’s largest producer of molybdenum.

FCX’s portfolio of assets includes the Grasberg minerals district in Indonesia, one of the world’s largest copper and gold deposits; significant mining operations in the Americas, including the large-scale Morenci minerals district in North America and the Cobre Verde and EI Allo operations in South America; and the Tenke Fungurume minerals district in the Democratic Republic of Congo.

Richard C. Adkerson is President and Chief Executive Officer and a director of Freeport-McMoRan Copper & Gold Inc.

He graduated from Mississippi State University with a BS degree with highest honors and an MBA degree. In 2010, he received an Honorary Doctor of Science degree from Mississippi State. He also completed the Advanced Management Program of the Harvard Business School in 1988. Prior to joining Freeport-McMoRan in 1989, he was Partner and Managing Director in Arthur Andersen & Co. where he headed the Firm’s Worldwide Oil and Gas Industry Practice. From 1976 to 1978, he was a Professional Accounting Fellow with the Securities and Exchange.

Mr. Adkerson is past Chairman of the International Council on Mining and Metals. He is a member of the Council on Foreign Relations, The Business Council and the Business Roundtable. He serves on the Advisory Council of the Kissinger Institute on China and the United States and as a member of the Clinton Global Initiative. He serves on the Board of Directors of the Arizona Commerce Authority, Greater Phoenix Leadership, the Greater Phoenix Economic Council and the Dean's Council of 100 for the Arizona State University W. P. Carey School of Business. He is also a member of the Mississippi State University Foundation Board of Directors and served as its President, chaired its “State of the Future” capital campaign, serves on the University’s Advisory Board for the College of Business and was named National Alumnus of the Year of Mississippi State University in 2011. He was inducted into the American Mining Hall of Fame in 2010, received The American Institute of Mining, Metallurgical and Petroleum Engineers Charles F. Rand Memorial Award in 2011 and named Executive of the Year by the W. P. Carey School of Business Dean’s Council at Arizona State University in 2011.

Why do you believe STEM Education/workforce development is important to our nation’s future? Many research studies have shown most of the fastest-growing occupations will require at least some background in STEM. Based on current data trends, the number of college and career ready graduates in STEM fields will not meet demand created for STEM jobs in the nation’s workforce. In addition, research demonstrates that on average STEM jobs yield 75% higher average annual salary compared to non-STEM jobs. This means that for the U.S. economy to thrive, it must prepare a qualified workforce.

How can we do a better job to strategically coordinate all those engaged in STEM across the company? Freeport-McMoRan brings key operational and technical leaders to the table with our human resources and community development teams to build a strategy for engagement and investment with schools and other STEM education partners. This approach has allowed us to gain a more comprehensive understanding of our internal workforce needs and challenges, and created the basis to align our educational investments and outreach activities. One result of this effort has been the creation of a new approach that we call the “U-Team” program which identifies representatives from all relevant departments together to form teams, one assigned to each of our partner universities, to strategically engage with faculty and students related to STEM workforce needs.

How has your corporation coordinated investments in education with future workforce needs? Freeport-McMoRan takes a strategic approach to investing in STEM education, placing an emphasis on programs and initiatives that help students acquire the skills necessary for success in a global, knowledge-based economy and society. The programs we support are designed or selected for their ability to increase student interest, improve teaching ability and confidence in subject matter, and improve achievement and outcomes in STEM disciplines. Our goal is to inspire students to pursue post-secondary degrees or trade and technical certifications—and ultimately careers—in mining and other STEM related industries. We have also found value in coordinating our educational investments throughout the entire organization, including internal and external collaborations of collective impact initiatives that work to set a common agenda among all involved, such as Science Foundation Arizona's STEM Network, 100Kin10, and Change the Equation.

What is the key to smart STEM investments? We believe supporting collective impact or collaborative investment opportunities such as 100Kin10, Science Foundation Arizona’s STEM Network and Change the Equation allow for the most informed and impactful investing, and are key to smart STEM investments. Instead of investing in STEM education in isolated ways, supporting these efforts to coordinate and convene all types of partners address the needs in STEM education—working together toward the shared objectives of all partners, and helping to connect schools and students with the particular resources they need to improve performance. These organizations and initiatives have also made evaluation and impact analysis central to their work, which allows financial supporters to make knowledgeable investments in the programs that have demonstrated the best results and/or the best potential.

What is the STEM initiative that your company has supported are you most proud? There are many organizations in this arena that have demonstrated a deep and strategic commitment to improving STEM education and student outcomes who we are proud to call our partners. One partnership that we believe brings so many of the benefit most capable partners together is 100Kin10, a multi-sector effort to prepare, deploy and support 100,000 excellent STEM teachers in the United States over the next 10 years. In 2011, we pledged to invest $1.5 million over three years to support STEM teacher development programs in Arizona, Colorado and New Mexico, the states where our mining operations are located. Partners across the country in nearly all states include school districts, institutes of higher education, nonprofit organizations, museums and others.

How is your company connecting diversity initiatives with STEM initiatives? Is this a part of your comprehensive strategy? Freeport-McMoRan has a sustainability target to make knowledgeable investments in the programs and initiatives that have demonstrated the best results and/or the highest average annual salary compared to non-STEM. Based on current data trends, we have found increasingly disproportional representation in managerial roles, to 15%. An important element of our STEM strategy includes increasing opportunities for girls, women and minorities by increasing their interest in STEM disciplines, and training them for specific job opportunities within our industry. We believe supporting collective impact or collaborative investment opportunities such as 100Kin10, Science Foundation Arizona’s STEM Network and Change the Equation allow for the most informed and impactful investing, and are key to smart STEM investments. Instead of investing in STEM education in isolated ways, supporting these efforts to coordinate and convene all types of partners address the needs in STEM education—working together toward the shared objectives of all partners, and helping to connect schools and students with the particular resources they need to improve performance. These organizations and initiatives have also made evaluation and impact analysis central to their work, which allows financial supporters to make knowledgeable investments in the programs that have demonstrated the best results and/or the best potential.
Gregg Lowe
President and Chief Executive Officer
Freescale Semiconductor

Freescale Semiconductor is a global leader in embedded processing solutions, providing industry-leading products that are advancing the automotive, consumer, industrial and networking markets. From microprocessors and microcontrollers to sensors, analog integrated circuits and connectivity—our technologies are the foundation for the innovations that make our world greener, safer, healthier and more connected.

At Freescale, we are committed to being a leader as a corporate citizen by partnering with organizations that support our commitment to STEM education. Going forward, we are expanding our community relations charter to focus on STEM education initiatives that span the K-20 pipeline with the goal of igniting the curiosity in young minds and encouraging them to pursue careers in STEM.

Freescale is based in Austin, Texas, and has design, research and development, manufacturing and sales operations around the world. http://www.freescale.com

Gregg Lowe was appointed president and CEO of Freescale Semiconductor, effective June 2012. He joined Freescale from Texas Instruments, where he was senior vice president, Analog.

Gregg joined TI’s field sales organization in 1984, with responsibility for growing the company’s business with automobile manufacturers. In the early ‘90s, he led TI’s European automotive sales force, managing teams and customer relationships in France, Germany, Italy, England and Spain.

In the mid ‘90s, Gregg managed TI’s Microcontroller organization. Later, he led the Application Specific Integrated Circuit organization for TI, overseeing a worldwide team with design centers and customers in all major regions. In 2001, he moved to the Analog business to manage High Speed Communications and Controls. Later that year, Gregg became manager of the High Performance Analog business unit with responsibility for TI’s high-performance data converters, amplifier, power management and interface integrated circuits.

Gregg earned a Bachelor of Science degree in electrical engineering in 1984 from Rose-Hulman Institute of Technology in Terre Haute, Indiana. He later received the university’s Career Achievement Award to recognize his accomplishments in the community and within the semiconductor industry. He graduated from the Stanford Executive Program at Stanford University. He is also fluent in German.

Gregg serves as a member of Rose-Hulman Institute of Technology’s Board of Trustees. In 2010, the Rock and Roll Hall of Fame and Museum, Inc. in Cleveland, OH, appointed Gregg to its Board of Trustees.

Why do you believe STEM Education/workforce development is critical to our nation’s future?

We live in a technology-driven world. Virtually every aspect of our lives can be made safer and more productive through the benefits of modern electronics. The future of our global economy is based in large part on engineering and applied technology. American industries, however, are at risk due to a shortage of engineering talent and expertise. Not enough American students are graduating to engineering and technology fields. We must entice more students to study in the STEM fields that will drive tomorrow’s economy.

What do corporations need to do to create more STEM careers and fill existing jobs?

The demand for engineers and scientists could well outweigh the supply in the future. An active partnership between business and the educational system is required to create and nurture the workforce of the future. As a corporation with a vested interest in the potential of science and technology, we have been seriously undermined due to an under-representation of minorities and women. A lack of role models is certainly a critical factor, and we are actively pursuing programs that will correct that imbalance.

What principles do you apply to your professional and personal life to advance STEM education?

Professionally, I am an engineer as well as a CEO. When I am speaking publicly to students, I try to make the point that 20 percent of Fortune 500 CEOs have a degree in engineering. Engineers are often the leaders of start-up companies, and we are seeing technology as a key driver of our economy in virtually every sector.

As I approach my first anniversary as Freescale CEO, we are making STEM initiatives the keystone of our community relations program. We have a strong legacy in university support programs that provide engineering students additional insight and access to our product technology platforms, but we need to do a better job of making younger students more interested, empowering them and showing them how they can make a difference in the world.

“A strong tie to the educational system is required to create and nurture the workforce of the future.”
Jeffrey R. Immelt
Chairman and Chief Executive Officer

GE is committed to helping bolster STEM education and improve America’s competitiveness. Through the GE Foundation, affinity networks and other company initiatives, GE has advocated for rigorous standards and innovative practices in the educational system and mentored high school students interested in technology and engineering careers. GE also offers high-skill training and advanced manufacturing job opportunities for U.S. military veterans transitioning to civilian life. GE is proud to have a workforce that currently includes more than 10,000 U.S. veterans and recently set a goal of hiring 1,000 veterans each year for the next five years.


Jeffrey R. Immelt is the ninth chairman of GE, a post he has held since September 7, 2001. Mr. Immelt has held several global leadership positions since coming to GE in 1982, including roles in GE’s Plastics, Appliances, and Healthcare businesses. In 1989 he became an officer of GE and joined the GE Capital Board in 1997. A couple years later, in 2000, Mr. Immelt was appointed president and chief executive officer. Mr. Immelt has been named one of the “World’s Best CEOs” three times by Barron’s, and since he began serving as chief executive officer, GE has been named “America’s Most Admired Company” in a poll conducted by Fortune magazine and one of “The World’s Most Respected Companies” in polls by Barron’s and the Financial Times. Mr. Immelt was the chair of President Obama’s Council on Jobs and Competitiveness. He is a member of The American Academy of Arts & Sciences. Mr. Immelt earned a B.A. degree in applied mathematics from Dartmouth College in 1978 and an M.B.A. from Harvard University in 1982. He and his wife have one daughter.

Why do you believe STEM Education/workforce development are critical to our nation’s future?

For any company or country to stay competitive, they need two things: talent and technology. The foundation for both is a real investment and commitment to STEM education. That must begin with a revamped and rigorous K-12 curriculum and continue with skill development and training for both those about to enter the workforce and those already at work.

How do you believe STEM education can improve a nation’s competitiveness?

Each year we conduct a study of global executive and their view of innovation. Not surprisingly, executives are concerned over their ability to maintain a competitive edge in a fast-paced, more globalized and resource-constrained world.

In this environment, everyone is looking for the same thing: resilience and productivity. We think one of the ways to deliver that is by connecting the Internet to the global industrial system—connecting software, analytics and low-cost sensing to create cleaner and more efficient jet engines, power plants, hospital systems. We call this the Industrial Internet. It will lead to high-tech jobs, a sustainable infrastructure and enhanced competitiveness. But it all starts with a commitment to STEM.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

There is a lot do here. But at a first step, I believe, lies in actively recruiting women and underrepresented minorities to STEM careers and providing the tools they need to advance. We have to create a network of mentors and role models. This is critical because we have to build interest at an early age. Young people need to see that they can succeed in these fields and make a real difference working on issues critical to our nation.

That is a big reason why GE’s Women’s Network joined MIT and other universities to create STEM camps. We give middle school-aged girls the opportunity to spend some of their summer working on fun technology projects, hopefully developing a lifelong interest.

I think closing the STEM gap is almost as critical as STEM education itself. Whether we are talking about reliable and efficient energy sources or lifesaving healthcare innovations that are affordable and accessible, we face some real challenges. But our challenges are only insurmountable if we keep so much of our best talent on the sidelines.

What is the STEM initiative that your company has supported are you most proud?

At GE, we are proud of all the STEM initiatives we have supported, for instance the Common Core Standards in our educational system. These standards will help American students compete anywhere in the world. In partnership with the Cleveland Metropolitan School District, we also helped open a STEM high school on the campus of NELA Park, our lighting business’s global headquarters. It is very rigorous, and students can work with our engineers while obtaining college credits.

Another initiative of which I’m particularly proud is the “Get Skills to Work” program. In addition to their brave service, we think veterans have a unique combination of technical proficiency and intangible qualities like leadership. But in the past, we haven’t always connected those attributes with the specific skills needed in the workforce. So we’ve joined with other major manufacturers and educators to prepare and place veterans in long-term careers.

Recently, the first “Get Skills to Work” class earned their nationally recognized certification, enabling them to start meaningful careers in advanced manufacturing. It’s a great milestone, and it’s only the beginning.

What do we need in the US to continue to be at the top of global innovation?

I look at this in terms of systems of competitiveness—how all of the pieces fit together. We need to invest in our infrastructure; it’s a critical innovation and competitiveness. We need to find a way to work together and create some fiscal certainty so businesses can invest, and, as a part of that, increase our overall spend on R&D. We need to support small and mid-sized companies because they’re often the source of groundbreaking innovation. And, of course, we must invest in the foundation of it all: education.

How should those working to improve the STEM workforce measure success?

When measuring the effectiveness of STEM investments and improving the STEM workforce, I would apply the same standard we apply to everything else, and that is: what are the outcomes? Are more girls and underserved minorities pursing careers in math, science and technology, and are more jobs available for them? Is our manufacturing base growing and vibrant, and connected to that, can American manufacturers find the talent to fill the jobs? Are American companies as innovative, if not more so, than our international competitors?

When we answer “yes” to all of those questions, we’ll know our work to improve STEM education and the STEM workforce is successful.
Daniel F. Akerson
Chairman and Chief Executive Officer
General Motors

Headquartered in Detroit, Mich., General Motors is one of the world’s largest automakers. GM and the GM Foundation support the development of the next generation of leaders and innovators by making education more accessible, affordable and rewarding from birth through college. The GM Foundation pledged $27.1 million to the United Way for Southeastern Michigan to establish a “Network of Excellence” in seven Detroit-area high schools. The $2 million grant is infusing STEM into the curricula, and aims to improve graduation rates from roughly 50 to 80 percent over five years. The GM Foundation also funds one of the largest scholarship programs in the country—the $4.2 million annual Buick Achievers Scholarship Program that supports students interested in pursuing STEM majors and careers. GM and the GM Foundation both support programs that reinforce math and science skills among younger students, including MathCounts, FIRST Robotics and the SAE Foundation’s “A World in Motion” initiative.

Why do you believe STEM education/workforce development is critical to our nation’s future?

To ensure the strength of our nation and grow our economy, the next generation of leaders and innovators must have the skills and education necessary to start kindergarten ready to learn. The U.S. Department of Labor’s STEM jobs account for more than 50 percent of the country’s economic growth, yet only five percent of the workforce are employed in STEM fields. Of those five percent, a majority are reaching retirement age leaving many to wonder to whom they will pass the torch. Securing qualified engineering, and IT talent will continue to be critical to our success. GM can only progress if we continue to feed a pipeline of innovative, tech-savvy, globally-focused young thinkers to our product development teams. There has never been a more important time for leaders in STEM fields to develop the next generation of talent.

How do you encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

GM aims to inspire young people to pursue STEM careers and those in the automotive industry. To do that, we must instill a passion for discovery and in and out of the classroom, through innovative curricula and hands-on experiences providing students with real world applications for math and science in the classroom will capture their interest early. We must also do a better job of identifying STEM leaders in elementary and secondary programming to help guide women and minorities into the STEM workforce. The GM Foundation has made significant educational investments to bolster STEM curricula and recognizes the importance of early education. Through its sponsorship of SAE International’s “A World in Motion” (AWIM), STEM education is brought to life in the classroom for K-12 students. Events including the AWIM Fuel Cell Olympics reinforce STEM curricula and spark the imaginations of young people to envision rewarding careers in engineering, science and technical fields. In 2012, GM volunteers mentored nearly 8,500 students through the AWIM program.

How has your corporation coordinated investments in education with future workforce needs?

General Motors and the GM Foundation have a long history of investing in education initiatives and encouraging students to pursue STEM careers. The GM Foundation supports the development of the next generation of leaders and innovators by making education more accessible, affordable, and rewarding from birth through college. In 2010, the GM Foundation pledged $27.1 million to the United Way for Southeastern Michigan to establish a “Network of Excellence” in seven Detroit-area high schools. The grant is infusing science, technology, engineer-
ing and math into curricula, and aims to improve graduation rates from roughly 50 percent to 80 percent over five years. The grant will also be used to advance early childhood education in metro Detroit and help ensure that 80 percent of children in the region graduate from high school. The GM Foundation also funds the $4.2 million annual Buick Achievers Scholarship Program to support students pursuing STEM majors. The GM Foundation also provides approximately $3 million to colleges and professional organizations through its annual University Grants program to advance STEM curricula.

Where do you see the biggest area of opportunity in advancing STEM jobs/careers?

To find opportunities, we must identify our biggest challenge. The fact is, far fewer students are graduating with STEM degrees, leaving three in every four STEM positions vacant. If we can train and educate our current generation of students early on and through their college years, we will improve our economy and meet workforce demands with domestic talent. The automotive and transportation industries are the largest opportunities to advance STEM jobs, through career stability and fulfillment. The nation’s reliance on transportation marks our industries as crucial to our economy. New advancements in technology have revolutionized the automotive industry, from the production line to the cars our customers drive. We are leading more and more technological advancement than ever before, which will continue to increase demand for high caliber talent.
Richard J. Kramer
Chairman, President and Chief Executive Officer
The Goodyear Tire & Rubber Company

The Goodyear Tire & Rubber Company is one of the world’s leading tire companies, with operations in most regions of the world. Together with its U.S. and international subsidiaries and joint ventures, Goodyear develops, manufactures, markets and distributes tires for most applications. It also manufactures and markets rubber-related chemicals for various applications. Goodyear is one of the world’s largest operators of commercial truck service and tire retreading centers. In addition, it operates approximately 1,400 tire and auto service center outlets where it offers its products for retail sale and provides automotive repair and other services. Goodyear manufactures its products in 52 facilities in 22 countries. It has marketing operations in almost every country around the world.

Previously, he had been the company’s Senior Vice President, Strategic Planning & Restructuring since 2003 and Vice President, Finance for North American Tire since 2002. Kramer joined Goodyear as Vice President of Corporate Finance in 2000. He previously was a Partner with PricewaterhouseCoopers, where he worked for 13 years.

Kramer was born in Cleveland, Ohio, on October 30, 1963. A graduate of John Carroll University, he earned a Bachelor of Science degree in business administration in 1986. He is a member of the Board of Directors of The Sherwin-Williams Company. A certified public accountant, Kramer is married with four children.

What is the STEM initiative that your company has supported are you most proud?
For 13 years, The Goodyear Tire & Rubber Company has organized Engineering Career Day for middle and high school students in Northeast Ohio. Students rotate through a series of panel presentations and demonstrations from local organizations, which include a hands-on competition requiring use of engineering acumen, all culminating in an end-of-day “STEM challenge,” as the top teams compete for points. Several universities, along with more than 20 Akron/Cleveland-area corporations have representatives present for an informational fair, panel discussions and hands-on demonstrations to help students learn about careers in engineering. The goal of the day is to bring STEM-minded students together to see how fun engineering can be, to promote teamwork in innovation, and to expose them to some of the many career opportunities in engineering. This year, more than 1,200 students are registered to attend the event. Considering so many students—and teachers—are willing to spend seven hours on a Saturday learning about engineering, we feel this program is a huge success.

How has your corporation coordinated investments in education with future workforce needs?
All of the charitable support The Goodyear Tire & Rubber Company provides to education is in some way tied to a business need. The bulk of those activities are aligned with our engineering and scientific needs. For example, we provide 20 college scholarships to students from Akron City Schools who are seeking college majors tied to STEM education, Employment at Goodyear is not a condition of these scholarships; however, we feel they help encourage more students from the inner city to seek careers in STEM.

In addition, in any given year, we also have nearly 50 co-op and intern opportunities for individuals in the engineering and science fields. These programs provide Goodyear with a talent pipeline, but we also believe the heavy promotion of our co-op and intern programs by the universities are a further enticement for high school students to consider pursuing a degree in a STEM-related field. It is proof to them that there are jobs out there, which is particularly attractive in today’s global economy.

Our technical leaders also are encouraged to invest their time, with many of them serving on advisory councils for local university engineering and technical programs.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?
The key is to reach them in the schools as early as possible and demonstrate that it is a rewarding and viable career option. That is why The Goodyear Tire & Rubber Company provides funding for STEM programs within our city schools—some of it at the elementary school level—and provides the aforementioned college scholarships as an enticement.

In addition, our Engineering Career Day began as an event for female students only. As it evolved, we had a lot of requests to include boys, which we eventually did. However, girls still represent half of the attendees—a much better ratio than in the engineering workplace today. Moreover, in the engineering and scholarship competitions during Engineering Career Day, the female students win a commensurate amount of the time—further proving they belong in the field.

Why do you believe STEM education and workforce development are critical to our nation’s future?
Every company is looking for its competitive advantage. Innovation is the biggest thing that will set us apart. Innovation was at the root of the transformation for our North American business unit over the past year, and it will continue to help us sustain our success. Innovation enables us to evolve, to be creative, to grow, to adapt. While innovation comes in all forms—sometimes related to STEM, sometimes not—our engineers and scientists play a key role in our innovation process.

“Innovation is the biggest thing that will set us apart.”
Since joining Google in 2001, Eric Schmidt has helped grow the company from a Silicon Valley startup to a global leader in technology. As executive chairman, he is responsible for the external matters of Google: building partnerships and broader business relationships, government outreach and technology thought leadership, as well as advising the CEO and senior leadership on business and policy issues.

From 2001-2011, Eric served as Google’s chief executive officer, overseeing the company’s technical and business strategy alongside founders Sergey Brin and Larry Page. Under his leadership, Google dramatically scaled its infrastructure and diversified its product offerings while maintaining a strong culture of innovation.

Prior to joining Google, Eric was the chairman and CEO of Novell and chief technology officer at Sun Microsystems, Inc. Previously, he served on the research staff at Xerox Palo Alto Research Center (PARC), Bell Laboratories and Zilog. He holds a bachelor’s degree in electrical engineering from Princeton University as well as a master’s degree and Ph.D. in computer science from the University of California, Berkeley.

Eric is a member of the President’s Council of Advisors on Science and Technology and the Prime Minister’s Advisory Council in the U.K. He was elected to the National Academy of Engineering in 2006 and inducted into the American Academy of Arts and Sciences as a fellow in 2007. He also chairs the board of the New America Foundation, and since 2008 has been a trustee of the Institute for Advanced Study in Princeton, New Jersey.

Eric E. Schmidt
Executive Chairman
Google

Google is a global technology leader focused on improving the ways people connect with information. Google’s innovations in web search and advertising have made its website a top internet property and its brand one of the most recognized in the world.

Google’s products include search, cloud computing, software and online advertising technologies.

Google.org develops technologies to help address global challenges and supports innovative partners through grants, investments and in-kind resources. We focus on problems where Google’s assets and core capabilities—technology innovation, global presence, making massive amounts of information universally accessible and useful—play strongest and where the solutions we create have the most potential to scale.

“Putting simply, technology breakthroughs can’t happen without the scientists and engineers to make them. The challenge that society faces is to equip enough people, with the right skills and mindset, and to get them to work on the most important problems.”

“(Creating technology is) almost impossible without greater emphasis on STEM education. Google, for one, is fully devoted to promoting STEM through many company initiatives, not the least of which is our support of the Cornell nYC Tech engineering school. We’re proud to be providing them with space in our building in Chelsea while their permanent home is being built on Roosevelt Island. The school is a place to cultivate a new generation of innovators, thinkers, doers.”

“STEM education is the best way to ensure more people are devoted to technological advancement, more minds are turning, more parents are seeing their kids learn the skills they need to succeed in a new economy —and more kids are sitting in school dreaming up totally crazy ideas that just might change the world.”

“Things we used to think were magic we now take for granted: the ability to get a map instantly, from our pockets; to work on a project with people a half a world away, at any time; to watch creative video content from anywhere on Earth, for free, or even to broadcast your own creation to the entire world. Maybe we couldn’t imagine these things five years ago. But, the point is, someone did.”

Sources:
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2 http://www.nydailynews.com/opinion/teach-tech-win-future-article-1.1214123#ixzz2VG2xlhFr
Dave Cote
Chairman and Chief Executive Officer
Honeywell

Honeywell (www.honeywell.com) is a Fortune 100 diversified technology and manufacturing leader, serving customers worldwide with aerospace products and services, control technologies for buildings, homes and industry; turbochargers; and performance materials. Based in Morris Township, N.J., Honeywell’s shares are traded on the New York, London, and Chicago Stock Exchanges. For more news and information on Honeywell, please visit www.honeywellnow.com

Dave Cote is chairman and CEO of Honeywell, a $38 billion diversified technology and manufacturing leader, serving customers worldwide with aerospace products and services, control technologies for buildings, homes and industry; turbochargers; and performance materials. He was elected president, CEO, and a member of Honeywell’s Board in February 2002 and named chairman of the Board on July 1, 2002.

Cote’s decade of leadership has seen Honeywell deliver strong growth in sales, earnings per share, segment profit, and cash flow. Honeywell has great positions in good industries. Honeywell’s growth is driven by technologies that address some of the world’s toughest challenges such as safety, security, clean energy generation, and energy efficiency. More than 50 percent of the company’s sales are outside the U.S. The company’s more than 130,000 employees, including 20,000 scientists and engineers, are focused on developing innovative products and solutions that help Honeywell’s customers—and their customers—improve performance and productivity.

Cote is a member of the steering committee of the Campaign to Fix Debt, a bi-partisan effort to build support for a comprehensive U.S. debt reduction plan. In 2011, Cote was named Vice Chair of the Business Roundtable (BRT) and Chairs the BRT’s Energy and Environment Committee. In 2010, Cote was named by President Barack Obama to serve on the bipartisan National Commission on Fiscal Responsibility and Reform also known as the Simpson-Bowles Commission. Cote was named co-chair of the U.S.-India CEO Forum by President Obama in 2009, and has served on the Forum since July 2005.

Honeywell has sponsored 36 Nobel laureate events since 2006. Honeywell has sponsored 36 Nobel laureate events since 2006.

Honeywell Initiative for Science and Engineering: This is a global educational program that reaches universities in emerging regions through on-campus lectures and one-on-one access with Nobel laureates and Honeywell’s top engineers, allowing them to see first-hand that what they are studying today can impact the world tomorrow through STEM-related careers.

Honeywell has sponsored 36 Nobel laureate events since 2006.

Where do you see the biggest area of opportunity in advancing STEM jobs/careers?
With populations and economies growing, global energy consumption could rise 44 percent by 2030. More than 50 percent of Honeywell’s portfolio is dedicated to energy efficient products and services that are focused on building a world that is safer and more secure, more comfortable and energy efficient, and more innovative and productive.

Improving the environment, reducing energy consumption and preserving resources can also represent the biggest opportunity for next-generation STEM jobs.

How should those working to improve the STEM workforce measure success?
Like most businesses, Honeywell regularly assesses its operations to make wise business decisions, determine strengths and weaknesses, shape decisions about improving or expanding our STEM-related programs or creating new ones, and avoid duplication.

Appropriate program assessment, such as collecting output and outcome data and conducting thorough assessments at regular intervals, can determine which STEM education programs and strategies are effective and which need improvement.

The process would also serve to directly funding to the most effective programs while still retaining the flexibility to invest in new and innovative programs.

How can we do a better job to strategically coordinate STEM efforts across the country?
There is a growing consensus in the business, scientific and education communities that we must work together and renew our commitment to strengthen American innovation and competitiveness through basic research in the physical sciences and math education.

This investment must be coupled with developing and retaining a high-quality mathematics and science teaching workforce. Coordinated efforts must be made to recruit teachers to enter mathematics and science studies and gain certification.

Honeywell recognizes that it is critical to use our resources to share our passion for innovation and technology and make an impact in educating and connecting people to STEM. Honeywell’s future workforce is reliant on our nation’s ability to train and educate future scientists and engineers.

Honeywell is committed to these efforts, and our Honeywell Hometown Solutions has taken several steps in this direction with non-profit organizations to deliver high-quality, award-winning programs to students from third grade through the graduate level.

We build STEM programs that deliver results we can quantify—one community, one home, one teacher and one student at a time—by applying the same rigorous, data-driven approach in our business. Programs are delivered to multiple levels of education, from middle through graduate school. Over time, our programs have produced students eager to pursue careers in science and engineering, including students around the world who have joined Honeywell after graduation and are now engineers.

What is the STEM initiative that your company has supported are you most proud of?
Honeywell Hometown Solutions has created a series of award-winning programs focused on STEM. In particular:

Honeywell Educators at Space Academy: Our job is to inspire our future generation of scientists and engineers and ensure the men and women who educate them are properly prepared. Inspiration starts in the classroom. In partnership with the U.S. Space and Rocket Center in Huntsville, Alabama, Honeywell created the Honeywell Educators @ Space Academy scholarship program for middle school math and science teachers.

Each year selected teachers participate in astronaut-style exercises and simulations, teachers learn new teaching practices in STEM education and can link all activities to professional development credits. More than 1,700 hundred teachers from 45 countries and 50 states and territories have graduated since 2004.

Honeywell Leadership Challenge Academy: This weekend event is available to high school children of employees where students have the opportunity to develop their STEM and leadership skills through science-oriented workshops, lectures and team exercises.

Developed in partnership with USRSC, the academy’s unique curriculum challenges students in key areas: purposeful leadership; effective communication; integrated planning; team cohesion; problem solving and critical thinking.

Since 2010, more than 630 students from 32 countries and all U.S. states have participated.

FMA Live!: FMA Live! was created by Honeywell and NASA, and is an award-winning hip hop science education program designed to inspire middle school students to pursue studies in STEM. The program teaches Sir Isaac Newton’s three laws of motion and the process of scientific inquiry in an innovative entertaining and memorable way by delivering science that supports the learning objectives of the National Science Education Standards.

Since 2004, 317,000 students from more than 800 U.S. middle schools have participated in the program.

How do you define the STEM workforce at your company?
Honeywell measures the STEM workforce by the number employees with STEM degrees and certifications and the number of STEM educational programs we support.

What is the STEM workforce strategy at your company?
Honeywell’s strategy is to ensure that our talent is aligned with our growth opportunities and business needs.

Cote received the Corporate Social Responsibility Award from the Foreign Policy Association in 2007, the Distinguished Achievement Award from Brnal Bricht International in 2011, the Asia Society’s Global Leadership Award in 2012, and the Peter G. Peterson Award for Business Statesmanship from the Committee on Economic Development in 2012.

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Michael W. Lamach
Chairman and Chief Executive Officer
Ingersoll Rand

Ingersoll Rand (NYSE:I), advances the quality of life by creating and sustaining safe, comfortable and efficient environments. Our people and our family of brands—including Club Car®, Ingersoll Rand®, Schlage®, Thermo King® and frame®—work together to enhance the quality and comfort of all in homes and buildings; transport and protect food and perishables; secure homes and commercial properties; and increase industrial productivity and efficiency. We are a $14 billion global business committed to a world of sustainable progress and enduring results. For more information, visit ingersollrand.com.

What do corporations need to do to create more STEM professionals and fill existing jobs?

Identifying candidates in the STEM space is critical for many global companies, including Ingersoll Rand. The U.S. manufacturing industry is expected to face significant challenges in attracting talent as Baby Boomers retire and not many Generation Ys are pursuing careers in STEM. Corporations should look at the whole pipeline of talent, including apprenticeship programs for high school students or GED grants, internships for undergraduate students and development opportunities for mid-career professionals.

One way we fill existing STEM jobs is through Ingersoll Rand’s Employee Resource Groups (ERGs). Members of these groups talk with their neighbors, friends and families across the globe about Ingersoll Rand. They know the STEM skills we need to succeed and help others become aware of opportunities.

Another way is our U.S. military veteran recruiting program. Many specialties in the armed services—such as logistics and supply chain management—map directly to positions requiring STEM skills. Our Military Recruiting Team is composed of former military personnel who match candidates with opportunities.

Attracting the most qualified candidates facilitates our ability to exceed customer expectations and be an innovative leader in the marketplace. That enables us to grow our operations and create more STEM jobs.

How has your corporation coordinated investments in education with future workforce needs?

A shortage of technical talent is a real possibility and would create problems for companies that rely on STEM professionals, like Ingersoll Rand. With 4,000 engineers globally, we rely on innovative thinking and technical expertise to deliver the best products and services.

We cannot afford a reduction of STEM students and want to see a strong pipeline of talented individuals to continue our 143-year history of innovation. As a result, we fund science competitions focused on engineering and environmental sustainability.

One program is the Solar Decathlon, a competition organized by the U.S. Department of Energy. It challenges 20 collegiate teams from around the world to design, build and operate solar-powered houses that are cost effective, energy-efficient and attractive. The program educates students and the public about building sustainable communities.

Ingersoll Rand has also hosted six Environmental Defense Fund (EDF) Climate Corps fellows over the years. This program gives students practical experience and enables companies to connect with universities. Last year, the EDF Climate Corps fellows at Ingersoll Rand helped identify potential savings of $1.6 million in energy costs.

These coordinated investments in education have a direct correlation to increasing interest in STEM jobs to meet our future workforce needs.

How is your company connecting diversity initiatives with STEM initiatives? Is this a part of your comprehensive strategy?

The single greatest unmet population for engineering talent is women. Yet young girls make the decision on whether they will pursue a math or science path by the time they are in the 4-6 grades. We have to generate interest among these girls to address the gap of women in STEM and sustain that passion as those young women attend college and choose their career.

It starts with appreciating differences. That is not only the physical attributes that you see like gender, but it is also in the experiences, thinking and backgrounds those women will bring to the companies they join.

Attracting young women to STEM is one way Ingersoll Rand connects its diversity initiatives to STEM. Our collaboration with the Society for Women Engineers is a good example where we partner on a K-12 outreach program for girls to get interested in engineering.

Encouraging young women to study STEM topics and pursue STEM careers will only improve the diversity of thought within companies. In return, the companies will grow in ways they didn’t think of and respond to customer needs in a way that they could not imagine.

What traits do corporate leaders need to effectively support and advance STEM education today?

Like other leading global companies, many of the employment opportunities at Ingersoll Rand require math and science skills. We have a wide range of STEM-related job functions and opportunities that people can pursue, including controls technicians, engineering specialists, field technicians, IT, program managers and business development professionals.

It is important for our leaders to support employees that fill these roles and also continue to work to advance STEM education. Corporate leaders can continue to leverage resources to better work with educators, create internships and establish mentor relationships.

The commitment to support and promote education initiatives needs to be evident company wide. It must be supported by managers and employees at all levels. We believe that it’s essential for us to continue making strategic investments in developing and supporting talent development initiatives.

At Ingersoll Rand, as we have incorporated STEM education and diversity as part of our overall talent development strategy, I am proud to say that we have many champions for our educational initiatives.
Ilene S. Gordon
Chairman, President and Chief Executive Officer
Ingredion Incorporated

Ingredion Incorporated (NYSE:INGR) is a leading global ingredients solutions provider specializing in nature-based sweeteners, starches and nutrition ingredients. With customers in more than 40 countries, Ingredion, formerly Corn Products International, Inc., serves approximately 60 diverse sectors in food, beverage, brewing, pharmaceuticals and other industries. Ingredion operates 35 manufacturing facilities and seven ingredient development centers around the world, including R&D headquarters in Bridgewater, N.J. A FORTUNE 500 company with 2012 net revenue of $6.5 billion, Ingredion has more than 11,000 employees worldwide, including hundreds of accountants, computer experts, engineers, finance professionals and scientists.

Why do you believe STEM education/workforce developments are critical to our nation’s future?

For the past 50 years or more, technological innovation drove almost half of the economic growth in the United States. STEM jobs are projected to grow twice as fast as all jobs in other fields and 80 percent of jobs in the next decade will require technical skills. Experts estimate that we could boost incremental annual GDP growth per capita just by enhancing the math proficiency of our students. However, we are falling behind other countries in STEM education. The World Economic Forum ranks the U.S. as 48th in the world in the quality of math and science education. And we lag in quantity as well. Only around 15% of bachelor’s degrees earned in the United States are in STEM fields versus close to half in China and over 35 percent in South Korea. Plus, China is graduating more than four times as many engineers than the United States.

The bottom line: It’s estimated that the United States may be short as many as three million high-skilled workers by 2018. As a leading manufacturer of ingredient solutions, Ingredion relies heavily on employees with STEM education or training. Technical innovation helps drive our growth, yet shortage of qualified employees could be an obstacle and it must be addressed.

What area of STEM are you most passionate about?

My STEM education has been one of the keys to my success in the business world. Whether it’s science, technology, engineering or math, I believe an education in any of the STEM disciplines enhances analytical thinking, which is essential to making sound, fact-based business decisions that drive results.

Without shop class in elementary school, physics and math and my interest was encouraged by my parents and teachers. This support gave me the confidence to push the boundaries and break barriers in traditionally male-dominated classes and professions. But not all young girls growing up have the same experiences. Ingredion is a strong supporter of Girls4Science, a nonprofit group dedicated to exposing Chicago-area girls to science, technology, engineering and math. It’s a fantastic grassroots organization that helps girls overcome barriers to achieving success in STEM fields. While grassroots programs like Girls4Science may initiate interest, these are only catalysts in launching STEM careers. Without additional opportunities in higher education, the dreams of these budding STEM professionals could be thwarted. That’s why continued public and private support for STEM education at our nation’s college and universities should be a priority.

What do Corporations need to do to create more STEM careers and fill existing jobs?

As an innovative manufacturer of ingredient solutions, we depend on qualified employees with technical expertise to work across many functions—from research and development to operations, to IT—in locations around the world. In some areas, there’s a strong competition for the best and brightest talent. We reach out to schools with STEM programs to promote Ingredion as an employer of choice and to identify outstanding candidates. We also offer training and development programs to current employees to update and enhance their technical skills. Finally, we support programs that expose young students to STEM careers and education in an effort to capture their interest and motivate them at an early age.

I am entirely confident that fielding a more balanced gender workforce—not to mention a more ethnically diverse one—will positively change the game. And not just for my company, but for all companies, for medicine, for education, for humanitarian efforts, for the advancement of the human race.

From an early age, I was exposed to science and math and my interest was encouraged by my parents and teachers. This support gave me the confidence to push the boundaries and break barriers in traditionally male-dominated classes and professions. But not all young girls growing up have the same experiences. Ingredion is a strong supporter of Girls4Science, a nonprofit group dedicated to exposing Chicago-area girls to science, technology, engineering and math. It’s a fantastic grassroots organization that helps girls overcome barriers to achieving success in STEM fields. While grassroots programs like Girls4Science may initiate interest, these are only catalysts in launching STEM careers.

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I am entirely confident that fielding a more balanced gender workforce—not to mention a more ethnically diverse one—will positively change the game. And not just for my company, but for all companies, for medicine, for education, for humanitarian efforts, for the advancement of the human race.

From an early age, I was exposed to science and math and my interest was encouraged by my parents and teachers. This support gave me the confidence to push the boundaries and break barriers in traditionally male-dominated classes and professions. But not all young girls growing up have the same experiences. Ingredion is a strong supporter of Girls4Science, a nonprofit group dedicated to exposing Chicago-area girls to science, technology, engineering and math. It’s a fantastic grassroots organization that helps girls overcome barriers to achieving success in STEM fields. While grassroots programs like Girls4Science may initiate interest, these are only catalysts in launching STEM careers. Without additional opportunities in higher education, the dreams of these budding STEM professionals could be thwarted. That’s why continued public and private support for STEM education at our nation’s college and universities should be a priority.

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How do you believe STEM education can improve a nation’s competitiveness?

Technological progress moves us forward as seen throughout history. We see it today in the functionality of our smart phones. Technology moves quickly and we must be ready with people who understand and have the knowledge to keep pace. This is why STEM is so important.

What do corporations need to do to create more STEM careers and fill existing jobs?

I don’t think the challenge is trying to create more tech jobs because companies are continuing to invest in STEM areas. If you have a STEM degree, the jobs are out there. There is tremendous opportunity for job seekers now and into the foreseeable future. So that’s the good news.

What I think some businesses may be missing out on is hiring women with STEM degrees. I’ve been in the technology industry for a while and it’s still too male-dominated, especially in leadership positions. This tells me that companies are missing some opportunities for exceptional talent, and they can and should do better.

How has your corporation coordinated investments in education with future workforce needs?

Well, part of the problem lies with the perception that STEM isn’t for the cool kids and that simply isn’t true. My company is involved in correcting that perception through mentoring and sponsoring organizations that demonstrate just how cool STEM really is. We sponsor and mentor FIRST Robotics teams in the Seattle area, our women scientists and engineers teach hands-on classes for Expanding Your Horizons, and we sponsor the Pacific Science Center’s Discovery Corps program, to name a few.

Our President & COO, Adriane Brown, actively participates in the STEMconnector® STEM Innovation Task Force, Pacific Science Center Board, and the national board for Jobs for America’s Graduates. Also, Geoff Deane, who heads our lab, is on the board for FIRST Robotics in Washington State.

These are two examples of how we invest time and talent in STEM education. There is a lot of attention given to STEM right now, but the broader education system is not perfect. STEM is an important piece, but we can’t stop there.

How should those working to improve the STEM workforce measure success?

I’d like to challenge the conventional wisdom that we don’t currently have enough qualified talent. I think we do, but we have to be more open when we’re evaluating the pool of candidates. At IV, we have some of the most talented women in our industry. Some of our most prolific inventors are women. For me, one measure of STEM workforce success is through measuring the inclusion and progress of women.

What do we need in the US to continue to be at the top of global innovation?

Well, there are many factors, but a few that stand out are:

1. We need kids to not just learn about science and math, but to apply what they learn through an educational system that is grounded in STEM.
2. We have a qualified workforce to meet our needs right now. We just need to do a better job of hiring women and minorities.
3. We need to make sure inventors continue to be respected and are rewarded for their work.
4. We need to continue to have a strong patent system. We need to be able to protect our ideas that give us a competitive advantage and we need to make those ideas just as easy to buy, sell and trade as going to the supermarket. Anything with value has a marketplace. Ideas should too. ■

Nathan Myhrvold, Ph.D.
Founder and Chief Executive Officer
Intellectual Ventures

Founded in 2000, Intellectual Ventures is an invention capital company. With more than $3 billion under management and more than 40,000 IP assets in active monetization programs, we have one of the largest and fastest-growing intellectual property portfolios in the world. We are building an active market for invention that allows buyers, sellers, and inventors to realize value for their ideas. We file patents on our own inventions, we purchase patents and collaborate with inventors, universities, governments and companies around the world. Through a variety of licensing products and services, we provide our customers access to the invention rights they need.

Nathan Myhrvold founded Intellectual Ventures after retiring as chief strategist and chief technology officer of Microsoft Corporation. During his 14 years at Microsoft, Myhrvold founded Microsoft Research and numerous technology groups. Myhrvold is an avid inventor who has been awarded hundreds of patents and has hundreds of patents pending.

Before joining Microsoft, he was a postdoctoral fellow in the department of applied mathematics and theoretical physics at Cambridge University and worked with Professor Stephen Hawking. Myhrvold earned a doctorate in theoretical and mathematical physics and a master’s degree in geophysics and space physics and a bachelor’s degree in mathematics from UCLA.

An avid nature and wildlife photographer, Dr. Myhrvold’s work is featured in the books “America 24/7” and “Washington 24/7” where his photographs helped capture a week in the life of people and nature in the United States during the spring of 2003. His research has been published in scientific journals including Science, Nature, Paleobiology, Environmental Research Letters, Journal of Verbesnavia Paleontology and the Physical Review, and he has contributed articles to magazines and online news sites including Harvard Business Review, The Wall Street Journal, Fortune, Time, Bloomberg BusinessWeek and National Geographic Traveler. In 2004, he provided the foreword to a book profiling some of the world’s greatest inventors—“Juice: The Creative Fuel that Drives World-Class Inventors.” He has also been named one of the most influential people in intellectual property by several leading IP trade publications.

Last year he released the award-winning “Modernist Cuisine: The Art and Science of Cooking,” a cookbook surveying the science, technology and techniques used in modern cuisine. The James Beard Foundation honored “Modernist Cuisine” with awards for Cookbook of the Year and Cooking from a Professional Point Of View. In 2012, he released the highly acclaimed Modernist Cuisine at Home.

"Technology moves quickly and we must be ready with people who understand and have the knowledge to keep pace.”
Anita Zucker
Chair and Chief Executive Officer
The InterTech Group

The InterTech Group is a global holding company that owns or has investments in a wide array of industries including aerospace, specialty chemicals, financial services, consumer products, location based entertainment, real estate, sports teams and arenas. The Company is listed by Forbes magazine as one of the largest privately held entities in the country.

Since being founded by Jerry Zucker in 1982, The InterTech Group has grown substantially through a series of acquisitions, expansions, takeovers, “green field” start-ups, and organic growth. The Company has purchased significant divisions of DuPont, Johnson & Johnson, and Exxon, among others. Public company takeovers include the 2006 acquisition of the Hudson’s Bay Company, North America’s oldest company, which was founded in 1670.

Philanthropy and community service are ingrained in the foundation of the InterTech Group with a focus an education, workforce development and STEM initiatives.

Zucker has served as president of the Charleston Metro Chamber of Commerce and the Education Foundation. Zucker also chaired the Drug-Free Workplace Program and participated in the School to Work Task Force. She is a past vice-president of Education and Leadership and formerly chaired the Business Education Council, and the Business Education Partnership Committee. She is a former member and past chairperson of the Trident Technical College Foundation Board and Executive Board. She was appointed to the Trident Technical College Area Commission by Governor Sanford in October 2007.

Zucker earned a B.A. in education from the University of Florida and a Master’s of Education from the University of North Florida. She taught elementary school for over a decade.

Why do you believe STEM Education/workforce development are critical to our nation’s future?
Now more than ever, industries and markets are powered globally. Leaders are now viewing science, technology, engineering and math as more than a choice for students or a workforce. Our children and their children are making decisions today that are molding the future of communication and technology and these decisions will fundamentally change the way business is conducted in the future. We have to make strides daily to keep up with competitive nations—STEM is a driver of this. As the modern world evolves and becomes more connected, STEM education will ensure we thrive in a global economy.

Beyond Standards, what are the first steps we should take to curb the STEM education crisis?
Collaboration is critical as we revise and enhance the process of educating ALL children. A shared vision and institutional alignment will provide a solid foundation. Standards should be revised to guide our educators through the process of designing an appropriate curriculum. Further training of guidance counselors and educators will ensure we are moving students into STEM. However, we must not forget that education is a lifelong commitment that requires proper monitoring, measurement and reporting. Milestones and educational indicators should be used to extract real-time performance data from cradle to career. Once installed, the process should demonstrate a consistent flow of measurement, analysis and improvement.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?
Collaboration is a critical component in the education process. All students, specifically women and underrepresented minorities, should have many opportunities to learn from local individuals willing to share their experiences and expertise.

What traits do corporate leaders need to effectively support and advance STEM education today?
I am passionate about science. I view it as exploration and the process of creating new thoughts and ideas. In the world today, science represents progress. It is an opportunity to better understand how things work and the act of figuring out how to make improvements. It is about seeing something with your own eyes and gaining a new understanding. Whether I am observing brain surgery or reviewing composite materials in one of our manufacturing facilities, I am intrigued by the discipline.

How has your corporation coordinated investments in education with future workforce needs?
The InterTech Group, Inc., its member companies, and associates, as well as The InterTech Group Foundation, seek to make a difference in the lives of others. Education has become a top priority as we develop a future workforce. The InterTech Group currently supports programs within the top colleges and universities in South Carolina including the University of South Carolina, Clemson University, College of Charleston and The Medical University of South Carolina.

What is the key to smart STEM investments?
STEM investments should have a specific purpose with a focus on long term, exponential impact. As we invest in STEM education initiatives, we increase visibility while building a workforce and a cache of future educators. Within the framework of academia, innovation is born. It is the combination of design and sharing of innovation and creativity that ultimately increase our competitiveness as a nation.

What is the STEM initiative that your company has supported are you most proud?
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Denise Ramos is chief executive officer and president at ITT. She previously served as senior vice president and chief financial officer, and was responsible for all aspects of financial management and reporting for the global multi-industry company, as well as communication to the investment community.

Denise brings a unique background to her role as CEO that combines more than two decades in the oil and gas industry with significant retail and customer-centric experience. She began her career at Atlantic Richfield Company (ARCO) of Los Angeles, Calif., where she spent 21 years in a number of increasingly responsible finance positions, including corporate general auditor and assistant treasurer, the position she held when the company was acquired in 2000 by British Petroleum.

ITT is a diversified leading manufacturer of highly engineered critical components and customized technology solutions for the energy, transportation and industrial markets. Building on its heritage of innovation, ITT partners with its customers to deliver enduring solutions to the key industries that underpin our modern way of life. ITT’s long-standing brands include Goulds pumps, KONI shock absorbers, Cannon connectors and Endicott energy absorption devices. Founded in 1920, ITT is headquartered in White Plains, N.Y., with 9,000 employees in more than 35 countries and sales in a total of approximately 125 countries. The company generated 2012 revenues of $2.2 billion. For more information, visit www.itt.com.

Why do you believe STEM Education and workforce development are critical to our nation’s future?

Our nation’s economic future depends on our ability to adapt and thrive in an increasingly technologically savvy world and use the disciplines of science, technology, engineering and math to determine the products, services and solutions that will keep us at the forefront of the global economy. We must compete globally on almost every front—for customers, talent, profits, technologies and market share—and we will only be successful if our nation’s citizens are engaged and knowledgeable in the language of the STEM disciplines.

How do you encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

In the 21st century, students—like most of us—have access to a lot of data but much less context for that information. To help students understand the value of studying science, technology, engineering and math subjects, we need to help them put the information they have about these disciplines into perspective—framing the advantages of STEM education and careers from their point of view and their interests. We have to continually build our understanding of students’ frame of reference and what makes them tick so that we can continue to demonstrate the relevance of STEM disciplines and the career and professional opportunities they provide.

What do corporations need to do to create more STEM careers and fill existing jobs?

To broaden the STEM professions, corporate leaders need to have those traits and capabilities that encourage individuals across race, gender and nationality to pursue careers in science, technology, engineering and math, and that engage the widest possible participation in these careers. They must embrace diversity and become ever more transparent and open to an infinite variety of thoughts and viewpoints. Leaders also support STEM when they are successful change agents within their own organizations, continually pushing their teams and colleagues to embrace actions and policies that help them hire, retain and develop the broadest spectrum of talent.

What do we need in the U.S. to continue to be at the top of global innovation?

Today, our employees, customers, suppliers and other stakeholders come from all over the world representing a tremendous variety of perspectives and experiences. To create the best possible ideas, solutions, innovations and partnerships, we need to continue our progress in embracing diversity at all levels of our organizations. This nurtures talent across the broadest possible spectrum and ensures that all viewpoints, ideas and contributions are brought to bear on our innovation initiatives and challenges.

“Our nation’s economic future depends on our ability to adapt and thrive in an increasingly technologically savvy world and use the disciplines of science, technology, engineering and math to determine the products, services and solutions that will keep us at the forefront of the global economy.”
Alex Gorsky
Chairman and Chief Executive Officer
Johnson & Johnson

Johnson & Johnson is the world's largest and most broad-based health care company, providing products and services in the pharmaceutical, medical device and diagnostics and consumer sectors. Alex Gorsky, Chairman and CEO, leads approximately 128,000 Johnson & Johnson employees in our 275 operating companies around the world in meeting one single purpose—“Caring for the world, one person at a time.”

Our founders had deep backgrounds in science and engineering, and our 127-year history is grounded on delivering innovations that have contributed to major medical advances inspired by STEM solutions. These include the pioneering of sterile surgical practices in the 19th Century, to delivering the first FDA-approved medicine for multi-drug resistant tuberculosis in the past 40 years.

Johnson & Johnson aims to address significant unmet medical needs around the world, and is incredibly proud that more than one billion healthcare consumers across the globe rely upon the use of our innovative products each day.

How do you believe STEM education can improve a nation’s competitiveness?
I believe that health care is the number one issue facing every country, and that it will continue to be for the foreseeable future. Constant innovation will be needed to meet the growing needs and demand for accessible and affordable quality health care among the aging global population and rising levels of middle classes in countries around the world. The answer rests well beyond products and services, and must include developing new and more effective strategies, systems and processes. The foundation for meeting this challenge is a commitment to well-funded and academically rigorous STEM education.

What do we need in the U.S. to continue to be at the top of global innovation?
Innovation in the workplace begins in the classroom with exposure to STEM focused projects, programs and curricula. So much of the global economy is driven by the technological workforce of today. If the United States wants to remain the economic and technological leader in the 21st century global marketplace, it must invest in STEM education. Our workforce must excel in science, technology, engineering and math. That’s where the jobs are today and will expand in the future. A STEM education is worth the investment and I believe the payoff will benefit society exponentially.

What area of STEM are you most passionate about?
When I walk into a room with Johnson & Johnson scientists and researchers, I am always overwhelmed by their intellectual discipline and scientific passion, and when I witness their incredible advances, it is clear they are drawing on all of the STEM disciplines. This training enables our teams in today’s fast-changing world to live up to our responsibility to the doctors, nurses and patients, the mothers and fathers, and all others who use our products, which Robert Wood Johnson delineated for us when he wrote Our Credo in 1943.

Where do you see the biggest area of opportunity in advancing STEM jobs/careers? The latest U.S. Labor Department statistics project that the 20 fastest growing occupations for 2014 and 2015 will require significant math and science backgrounds. Johnson & Johnson is the global health care leader today because of the talent and capabilities of our employees, and through the significant investments we make in research and development, we create both demand and opportunities for highly skilled people who want to make a positive impact on society. Of course, we can’t predict what the next generation of scientists and innovators will come up with, but we know for sure they will need the foundation STEM training and discipline affords.

What is your advice to those involved in promoting STEM Education? First, thanks for what you’re doing! This work is vital to the country’s future success. It is important to paint the big picture when it comes to STEM, and the story is not merely about examining molecules and isolating viruses—though those tasks are vital parts of that story. The narrative we need to lay out is a much larger one. It speaks to solving global health problems that loom large before us—problems that do not respect geopolitical borders or disparities in age. A society educated and passionate about science, technology, engineering and math can help solve those problems, and we are proud to have a role in supporting and inspiring students to pursue a STEM-focused education.

“if the United States wants to remain the economic and technological leader in the 21st century global marketplace, it must invest in STEM education.”
Stephen A. Roell
Chairman, President and Chief Executive Officer
Johnson Controls

Johnson Controls is a global diversified technology and industrial leader serving customers in more than 150 countries. Our 168,000 employees create quality products, services and solutions to optimize energy and operational efficiencies of buildings; lead-acid automotive batteries and advanced batteries for hybrid and electric vehicles; and interior systems for automobiles.

For more than 125 years, Johnson Controls has enjoyed tremendous global growth. Our employees around the world continue to enable the company’s success. They create quality and innovative products, services and solutions for our customers. They seek new and better ways to improve how we work together. They make a difference in their community and for the world.

Johnson Controls employees have opportunity to learn and develop, to grow and perform to their fullest potential. They work in an environment that values their ideas, teamwork and personal safety.


Roell holds a Bachelor of Science in accounting from St. Ambrose University.

Roell is a member of the Business Roundtable. He also serves on the board of directors for Interstate Battery System of Americas, Inc., Wheaton Franciscan Healthcare, Hunger Task Force, Boys & Girls Club and Medical College of Wisconsin.

How has your corporation coordinated investments in education with future workforce needs?

Johnson Controls has partnerships with two Wisconsin universities. Our partnership with the Milwaukee School of Engineering provides a Johnson Controls laboratory on the campus to enable students to learn on full scale state of the art equipment. Students have access to experts from Johnson Controls. A high percentage of the graduates hold key roles in engineering positions.

The company also has a partnership with the University of Wisconsin’s campuses in Madison and Milwaukee through the creation of three storage research laboratories to develop next-generation batteries. This partnership attracts top-notch engineers to study and work in Wisconsin, while becoming a global research center for high-tech batteries.

What area of STEM are you most passionate about?

Johnson Controls is committed to the entire spectrum of STEM. To advance our products and services in the years to come the company will need the talents of a dedicated and highly trained workforce.

What is the STEM initiative that your company has supported are you most proud?

Johnson Controls is proud of all of our STEM initiatives. Some of our initiatives include:

• Board membership on STEM Forward Milwaukee
• A senior engineering leader in our Building Efficiency business supports and volunteers at Milwaukee inner city all-girls high school engineering program
• Our Power Solutions business supports a Milwaukee high school’s engineering curriculum
• A senior executive in our Power Solutions business is an avid and active STEM advocate
• Johnson Controls is a corporate sponsor for the 2013 regional and national Rube Goldberg High School Contest

How is your company connecting diversity initiatives with STEM initiatives? Is this a part of your comprehensive strategy?

Johnson Controls partners with two organizations dedicated to diversity. We partner with the Information Technology Senior Management Forum (ITSMF) to attract, retain and develop a diverse pool of IT leaders. The mission of the ITSMF is to increase African American representation in IT at senior levels. Johnson Controls supports two to three employees every year to receive training and leadership development from the ITSMF. The company also participates in quarterly ITSMF symposiums which give talented IT professionals exposure to Johnson Controls.

The company also partners with the National Action Council for Minorities in Engineering (NACME). The organization is dedicated to increasing the pool of engineering talent through scholarships and other support to minority students. NACME provides JCI access to a pool of qualified minority engineers across the country. Johnson Controls is represented on the board of NACME.

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Michael Araten
President and Chief Executive Officer
K’NEX Brands, L.P. and The Rodon Group

Founded in 1992, K’NEX Brands, the world’s most innovative construction toy company, was established to make and sell what has become one of the world’s leading integrated construction systems for children and is America’s STEM building solution. Winner of over 250 international awards and recognitions, K’NEX, America’s building toy company, is focused on Building Worlds Kids Love and encourages youngsters to “imagine, build and play.” From the living room to the classroom, K’NEX has building toys specially designed for every age group and skill level. The K’NEX family of brands includes K’NEX Building Sets, K’NEX Thrill Rides, K’NEX Education, Lincoln Logs®, Tinkertoy®, NASCAR®, Angry Birds™, Mario Kart Wii™, Mario Kart™, Super Mario™, PacMan™ and more. Since 1992, The Rodon Group, a subsidiary of K’NEX Brands, L.P., has manufactured over 3.1 billion parts for the K’NEX building toy system. Join us as we help build the leaders of tomorrow. For more information, please visit www.knex.com or www.rodongroup.com.

Michael Araten is the President and CEO of K’NEX Brands, L.P. K’NEX Brands has two primary business units, K’NEX Brands (the toy manufacturing, marketing, design and distribution company) and The Rodon Group (a highly automated plastics injection molding company) and The Rodon Group (a highly automated plastics injection molder with a focus on small parts used in over 100 industries, including food, beverage, windows, consumer packaged goods, construction and toys). K’NEX is distributed to over 40 countries, and over 95% of the component parts are made at The Rodon Group.

Founded in 1992, K’NEX Brands, the world’s most innovative construction toy company, was established to make and sell what has become one of the world’s leading integrated construction systems for children. From the living room to the classroom, K’NEX has building toys specially designed for every age group and skill level.

Prior to joining K’NEX in 2005, Araten served as Chief Litigation Counsel to Toll Brothers, Inc., as well as Senior Vice President and Corporate Counsel to O’Neill Properties Group. In his roles at O’Neill, he was responsible for handling risk management, regulatory approvals, human resource issues and the management of over 100 law firms in 21 states.

As President and CEO, Araten is responsible for all strategic and day to day operations of the company, and is a member of the K’NEX Board of Directors. He speaks regularly on topics including advanced manufacturing, the toy industry, re-shoring, global competitiveness, entrepreneurship and innovation and has appeared on CNBC, CNN, Bloomberg News and Fox Business News.

Mr. Araten holds a B.A. in Political Science from Stanford University and a J.D. from the University of Pennsylvania. He is currently a member of Visage, SMARTCEO and CEOInTorent.

He resides in Gwynedd Valley, Pennsylvania with his wife, Ellen and their two children.

Why do you believe STEM Education/workforce development are critical to our nation’s future? 

My personal belief is that STEM education is the heart of innovation. Innovation drives growth, profits & the roles of the future. There are 1 million unfilled manufacturing jobs in the US today. These jobs are unfilled because the employers can’t find people with the required skills. Manufacturing has changed dramatically in the past 20 years, with skilled jobs requiring higher computer skills, robotics and the ability to understand and operate complex equipment.

STEM Education and workforce development provide students today with the skills they’ll need to obtain good jobs in the future—the very skills that employers need. Without tech-savvy workers, the number of unfilled manufacturing jobs will increase.

At K’NEX & Rodon, we’ve seen firsthand the resurgence of local manufacturing, with a migration of business to China during the 1980’s and 1990’s. As wages increased in China and the price of transportations rises, companies are returning to manufacturing in the States. Speed to market is a huge advantage and a domestic supply chain is key to that speed.

Our investment in advanced technology and more efficient equipment has given us a competitive edge over overseas manufacturers, so we are well poised in the global economic environment. We need employees who have the ability to use this technology.

Today’s sophisticated manufacturing environment requires a higher degree of skill adaptability and entrepreneurial spirit from its employees.

How do you believe STEM education can improve a nation’s competitiveness?

All across the country, skilled manufacturing workers are in great demand. These jobs are solid, well-paying, long-term careers. STEM education prepares students for these careers. STEM education fosters critical thought, scientific literacy and innovation. Innovation requires education. Workers with STEM credentials are better educated. In 2011, 53 percent of all manufacturing workers had at least some college education, up from 43 percent in 1994. Source: U.S. Department of Commerce Economics and Statistics Administration.

STEM educated workers with less than a bachelor’s degree still enjoyed greater earnings (more than 30%) compared to those without STEM education. Each STEM job supports as an average of 2.9 other jobs in the economy. A commitment to developing future generations of innovators must become a priority of the federal government, public and private industry and educational institutions.

Beyond Standards, what are the first steps we should take to curb the STEM education crisis? Progress proceeds at the speed of trust, so we, (businesses, educators, and government), need to collaboratively build the trust required as a foundation of STEM to take root and grow. Corporations need to work with educational institutions to insure that STEM programs that align training and education with anticipated workforce needs are being developed and implemented in Pre-K through high school classrooms.

For example, the Rodon Group has developed its own apprenticeship program. Students are given the opportunity to learn tool and die making in a hands-on environment. These future industrial technologists must have a strong background in math and science skills. Coursework in metal working and machining is also very desirable. From there, Rodon will help develop the manufacturing skills needed for tomorrow’s innovative manufacturing environment.

We are also a founding member of The Bux-Mont Manufacturing Consortium, a group of local manufacturing companies Bucks and Montgomery Counties, working to advance the STEM skills and education needed for the future.

What do corporations need to do to create more STEM careers and fill existing jobs?

Corporations need to lead by example and show the pathways of opportunity. K’NEX and Rodon actively work with local community colleges and technical schools to make sure students—prospective employees—are getting the skills they need to work at companies like ours. Anyone who intends upon using manufacturing equipment as part of their career needs math and computer skills.

Many companies nationwide are currently working short-handed because it is hard to find workers with the skills they need. By partnering with local schools we are taking an active role in training potential future employees, ultimately ensuring that we can fill job openings with skilled workers.

Students in the programs we work with get the math, science and computer skills they’ll need for jobs that entail building and operating robots. When they begin working at our facility, they learn the manufacturing process, which we run with automation, computers and robots. As our workforce gets older and people retire, we need a pipeline of highly trained people ready to step in. By partnering with schools, we become the employer of choice.

What is the STEM initiative that your company has supported are you most proud?

We are America’s only building STEM solution. We design and provide over 25 K’NEX Education STEM sets for classroom use. Each set provides a complete STEM solution, focusing on STEM concepts taught in sequences that build upon each other and have real-world applications. Teacher guides include inquiry-based lessons that challenge students as they build, investigate, discuss and evaluate scientific and design principles in action. It is literally innovation in action.

This hands-on, inter-disciplinary approach gives students the skills and knowledge they need to become life-long learners who can solve problems, think critically, work collaboratively and adapt to change in today’s technologically evolving world.
Dr. Chris Nelson
President and Chief Executive Officer
Kemin Industries

Kemin is a privately held bioscience company that researches and manufactures molecules to deliver important nutrition and health benefits through products consumed by people and animals. The company has more than 500 specialty ingredients, nearly 2,000 employees and operates in 90 countries. Common STEM careers include accounting, information technology, market research and engineering. As a bioscience company, Kemin employs hundreds of scientists with a wide range of expertise—biology, chemistry, organic chemistry, analytical chemistry, biochemistry, microbiology, physics, biophysics, agronomy, plant biology, chemical engineering, and more. In addition, Kemin has an extensive internship program that provides practical, “hands-on” learning experience for students in their field of study. Kemin employs more than 20 interns at its headquarters in Des Moines, Iowa, every summer where they have an opportunity to apply their classroom education in a professional setting.

www.kemin.com

Why are STEM education and workforce development critical to Kemin’s future?

Every study shows the same alarming trend regarding our world’s population growth and the need to create more food with fewer resources. Thankfully, human ingenuity is now supported by the most amazing technology and innovation ever known to man. There is no doubt that in the next 20 years the most important advancements in all fields whether that is manufacturing, bio-sciences, research or medicine will be made through technology. While technology is at the heart of what is needed, it alone is not the answer. It takes people. Only through those trained in Science, Technology, Engineering and Mathematics (STEM) will we, the United States especially, be able to both support and compete in the global economy.

What do leaders need to effectively support the advancement of STEM education?

As an leader it takes a full understanding of critical issues and the ability to communicate a shared purpose to a team of well-trained and inspired people. While leadership is important, it is people with the right skills and education that will have the greatest impact. That’s why we support programs that interest young people in the sciences. We want to demonstrate to students the enormous impact they can have not only on their lives but the lives of others. We believe many of them will see science and technology are the tools by which they can affect or create just about anything.

How has Kemin made investments in STEM?

The Science Center of Iowa is where we make some of our most significant investments. In 1970 the Science Center of Iowa opened its doors as one of the first Interactive science centers in the world. At the time, hands-on programs and exhibits were considered “new wave”—now we know such interaction is the most effective way for children to engage and learn.

And we don’t stop with children. We know that information science education is one of the best ways to not only inspire young people but also engage their parents and grandparents, especially when it comes to the technology they use and need in today’s world. We also frequently host tours for students and community leaders to interact with Kemin scientists and researchers. It makes science tangible, memorable and “real” to those who have never seen applied science.

Where do you see is the biggest area of opportunity advancing STEM jobs and careers?

The biggest opportunity will come through the recruiting and engagement of more women in science. We know women have the intelligence, creativity and ability but areas of STEM continue to be male-dominated. I believe much of our future success will hinge on doubling the number of students interested in STEM-related areas of study and that means a focused effort on programs to engage girls and women.

How is Kemin connecting diversity initiatives with STEM initiatives?

We’ve understood that diversity is the key to creativity and that diversity means we have ideas coming from all sorts of people, regardless of race, gender or background. This diversity is absolutely critical in our creative process.

What are some of the STEM initiatives your company is supporting?

- Science Center of Iowa—Provide financial support that makes it possible for students and families to experience world-renowned interactive exhibits and programs. We were instrumental in helping raise funds for the construction of a new $62 million Science Center several years ago.
- Tours—Company representatives regularly give tours to students and community leaders, offering direct interaction with scientists and researchers.
- Externship program—Kemin regularly hires teachers as externs during the summer through the Iowa Mathematics and Science Education (IMSEP) externship program. This provides teachers with real-world experience, working alongside our scientists, that they can apply in the classroom.
- Member of the Iowa STEM Advisory Council
- Member of Iowa Biotechnology Association
- Member of the Iowa Innovation Corporation.

What do you think we need to do in the U.S. to continue to be at the top of global innovation?

There is no question that the U.S. educational system has been able to produce the most creative and most productive minds in the last 100 years. The question is how to continue this in the next 100 years. The key is to help students see that a background in science, technology, engineering and math is going to be an essential part of their lives. Just as learning how to use a cell phone is critical for their communication, we need to demonstrate relevance and impact.
John Veihmeyer
Chairman and Chief Executive Officer
KPMG U.S.
Chairman, Americas Region
KPMG International

KPMG LLP is a market-leading provider of audit, tax, and advisory services to businesses and governments worldwide, and a nationally-recognized great place to work and build a career. Our team of smart, passionate, high-performing professionals helps our clients and communities solve their complex challenges. As the U.S. member firm of KPMG International, which employs over 150,000 people and operates in more than 150 countries, we adopt a global approach to helping businesses, governments, public sector agencies and non-profits respond to change and disruption in their markets. Our high-performance culture is rooted in a set of shared values such as integrity, teamwork, openness and honest communication, and commitment to the individual. Beyond good business practices, KPMG is also recognized for its efforts to improve our communities, protect the environment, and support education—including the advancement of our nation’s focus on STEM.

Why do you believe STEM education/workforce development is essential to our nation’s future? As the economy evolves relentlessly toward digitization, machine intelligence, and analytics, STEM education and workforce development are critical to our nation’s continuing competitiveness. KPMG’s clients affirm this. Many companies—especially those operating on the forefront of technological innovation—are concerned that unless the U.S. focuses on STEM education, our nation won’t have the steady stream of talented workers needed to compete in a global marketplace. It’s estimated that only a third of the talent pipeline is prepared in the United States. KPMG is a member of the STEM workforce development partnership spotlight the opportunity. In 2011, the White House noted that STEM occupations will grow by 17 percent over the next decade, compared to about 10 percent for other occupations.

What traits do corporate leaders need to effectively support and advance STEM education today? A big key is self-awareness. Leaders must have an understanding of the skills and experiences their organizations need to succeed. It’s not always easy. Most organizations, especially global ones, are rapidly recognizing that while there’s a lot of disruption—economically, socially, and technologically—today’s enterprises are more complex; business models are transforming. Knowing where your organization fits within all of that change is key to knowing, first, that you are reliant on STEM disciplines for success; and second, where and to what extent you need to support and advance education. For example, at KPMG, our “Auditor of the Future” initiative gives us a forward-looking understanding of the skills and experiences our professionals need to successfully serve clients. Many of these skills fall within the STEM disciplines, in areas such as data and analytics, IT systems, controls, and processes.

What area of STEM are you most passionate about? While all four are important, at KPMG, we are especially passionate about technology and mathematics because the services we provide to our clients will be increasingly reliant on these disciplines. For example, “Big Data” is driving significant changes in how our clients seek insights from structured and unstructured data. Just like the data as an asset to make important decisions, operate more efficiently, and accelerate their speed to market. In addition, they’re wrestling with trends such as the “consumerization” of technology, which has shifted IT adoption momentum from the enterprise to employees and customers. Most enterprises are challenged to reposition their businesses in the face of these changes, and are looking to firms like KPMG for significant help to address both the challenges and the opportunities.

How is your company connecting diversity initiatives with STEM initiatives? In this a part of our comprehensive strategy? Diversity is a major component of KPMG’s business strategy, and our KPMG Foundation is a celebrated pioneer in efforts to enhance the linkages between business and higher education. At a graduate level, for example, the Foundation’s Minority Accounting Doctoral Scholarships help to further increase the completion rate among African-American, Hispanic-American and Native American doctoral students. KPMG’s nationally-recognized “PhD Project” works to increase the diversity of business school faculty by attracting African-Americans, Hispanic-Americans, and Native Americans to business doctoral programs and by providing a network of support during their doctoral studies. Since its inception in 1994, the Project has helped to triple the number of minority business professors. Further, the “PhD Project” provides national awards to the “Top 100 Most Influential People in Corporate Governance.”

What counsel would you provide around “collaboration to achieve success” in STEM education and workforce? Simply put, get involved. When business collaborates with academia, needs get identified and skills and experiences get transferred more efficiently and effectively. Today, hundreds of KPMG’s partners and professionals are actively engaged with universities across the U.S.; volunteering their time and talents in the classroom as instructors, serving on committees and advisory boards, and offering consultancy advice on a pro bono basis in areas such as curricular development. We help fund PhD candidates from the profession, invest in academic research programs and business case-study competitions for students. We also hire professors from campus to teach our “Business School” courses. This activity helps to strengthen the link between real-world issues and that which gets taught in the classroom.
Gerry P. Smith  
President, Americas Group  
Senior Vice President, Lenovo Group

Lenovo is a US$34 billion personal technology company—the second largest PC maker worldwide and an emerging PC Plus leader—serving customers in more than 160 countries. Dedicated to building exceptionally engineered PCs and mobile internet devices, Lenovo’s business is built on product innovation, a highly-efficient global supply chain and strong strategic execution. Formed by Lenovo Group’s acquisition of the former IBM Personal Computing Division, the Company develops, manufactures and markets reliable, high-quality, secure and easy-to-use technology products and services. Lenovo is a global industry leader in the education market (#1 worldwide in the education sector) and is uniquely positioned to make a sustainable difference through its support of education-related programs and initiatives. Lenovo aims to advance, enhance and extend education at all levels through its industry leading products and technologies, community investments and program sponsorships.

Mr. Gerry Smith leads Lenovo’s Americas business unit that covers the U.S., Canada, Brazil and the rest of Latin America, with responsibilities for sales, marketing, operations and customer service to attain the company’s revenue, unit volume and profit objectives in these territories. Prior to assuming his current role in November 2012, Mr. Smith was the head of the Global Operations organization, which encompassed the end-to-end supply chain, procurement, supply/demand planning, quality management and customer services, among other functions. He also served as executive sponsor of the company’s corporate Lean Six Sigma program and chairman, Board of Directors of Lenovo’s development and manufacturing joint venture with Compal Electronics.

Mr. Smith also oversees Lenovo’s STEM education initiatives in the U.S., which involve donating equipment, providing cash contributions and lending Lenovo’s expertise to schools and related organizations. Lenovo supports education investments in both K-12 and higher education.

Since joining Lenovo in August 2006, Mr. Smith served as senior vice president, Global Supply Chain, leading Lenovo’s end-to-end supply chain operations, which encompass order management, supply/demand planning, procurement, manufacturing, logistics, and customer fulfillment. During these six years, Mr. Smith led a significant transformation of the company’s global supply chain, making its operations more agile, efficient and cost competitive, while showing dramatic improvements in all key performance metrics and elevating overall customer satisfaction. For his accomplishments, he earned the 2009 Supply Chain Executive of the Year award at the SCM Logistics World 2009 conference.

Mr. Smith holds a bachelor’s degree in Finance and Marketing from Pacific Lutheran University.

How has your corporation coordinated investments in education with future workforce needs?

On a global scale, we are fiercely competitive in the PC, tablet, and smartphone arenas, as well as a leader in the education market for PCs. Some of our recent investments in STEM education include:

• An annual commitment of up to one percent of our pre-tax income to programs and initiatives that serve society; one of Lenovo’s key platforms is education, and we support investments in both K-12 and higher education.
• ThinkBank, Lenovo’s premiere annual education event and professional development conference, brings together K-12 and higher education institutions globally to share best practices on using technology to enhance teaching and learning.
• Investment in The Harpeth Hall Center for Girls in Nashville, Tennessee to elevate The Center for STEM Education for Girls to an international scale.
• Partnership with the National Academy Foundation and MIT to launch curriculum to teach students to create their own mobile apps.
• A 2011-2012 “Space Lab” partnership with YouTube to challenge 14-18 year olds to design a science experiment to be performed on the International Space Station.
• Donation of proceeds of sales to help STEM-related organizations (i.e. recent support of the North Carolina Science Olympiad).
• Lenovo sits on the Board of Innovate + Educate, an NGO focused on improving STEM education and closing the workforce skills gap.

What is the STEM initiative that your company has supported are you most proud?

Beginning in 2011, Lenovo partnered with the National Academy Foundation (NAF) to teach mobile application development to high school students across the U.S. to encourage greater student interest in STEM subjects and prepare them for the 21st century workforce. Five schools from NAF’s network of career academies participated in the semester-long program, and Lenovo provided a package of technology products to aid each school. Student teams used the technology to develop a working wireframe, business plan and implementation schedule for an Android-based mobile application. At the end of the semester, Lenovo and NAF selected 18 of the top students and sent them to Washington, D.C. to present their projects at the annual professional development summit, NAF Next. The program is one of Lenovo’s proudest achievements, and we hope to expand the project to more of NAF’s schools in the coming years.

What is your advice to those involved in promoting STEM education?

Lenovo’s “2011 Global Student Science and Technology Outlook” multi-country survey revealed that many students lack the confidence that they will have the technology background needed for tomorrow’s workforce. Technology companies, organizations, and professionals in particular can play a key role in reversing this trend by:

• Seeking out partnerships with schools and governments at the local, national, and international levels to raise awareness of this growing issue;
• Getting involved to teach students and grow their personal confidence and understanding of STEM studies;
• And introducing students to the many different elements and offerings of STEM careers.

How do you believe STEM education can improve a nation’s competitiveness?

In the PC+ Era, we are witnessing a fierce battle over talent as graduates are increasingly willing and able to relocate for the best job on the market. The whole world is excitedly awaiting the next major STEM advancement. We are seeing STEM professionals identified for recruitment as early as high school, as companies and governments look to leverage these students’ skills to fuel their country’s growth. The race for the best talent is leading to impressive new technological advancements not only in consumer technology, but also outside our industry as STEM-educated professionals are enhancing national infrastructure, curing diseases, and exploring space. This competitiveness starts with a strong STEM education system, with teachers and professors who can foster this talent and encourage students to pursue STEM careers.

Why do you believe STEM Education/workforce development is critical to our nation’s future?

Our strong education and workforce development programs have enabled our computer engineers to look at the traditional PC and think of its next evolutions—the latest iterations of tablets, convertibles, and mobile technology—that have become elements and offerings of STEM careers.

This competitiveness starts with a strong STEM education system, which involves donating, cash contributions, and lending Lenovo’s expertise to schools and related organizations. Lenovo supports education investments in both K-12 and higher education.
Leo A. Daly III, FAIA, RIBA, RFAIA, is Chairman and CEO of LEO A DALY, a U.S.-based international architecture, planning, engineering, and interior design firm. As such, he leads a team of professionals schooled in STEM disciplines who put their education and experience to work every day designing beautiful, comfortable, safe, and sustainable buildings.

Mr. Daly, who holds professional registration as an architect in 48 states and several countries, received his degree from The Catholic University of America in Washington, D.C., and is a member of its Board of Trustees. In 1981 he became chairman of the architectural firm founded by his grandfather and nurtured by his father. Since then, he has provided visionary guidance for the firm’s many professionals who serve as teachers, mentors, advisors, and jurors for students preparing for STEM design careers.

A supporter of STEM education, Mr. Daly believes in combining professionals from engineering, architecture, planning, and interior design into teams, assuring easy communication and headache-free projects for clients. His own teaming skills have garnered him international relations awards from the Hashemite Kingdom of Jordan, the Republic of Italy, and the government of Hong Kong. The firm’s Cheung Kong Center there is a towering example of STEM proficiency.

Mr. Daly is a Fellow of the American and Australian Institutes of Architects and has been awarded the Society of American Military Engineers’ Urbahn Medal in recognition of his work in architecture, particularly leading the design and construction oversight teams of the National World War II Memorial in Washington, D.C.

At LEO A DALY, we’re passionate about architecture, engineering, and interior design, all professions that require grounding in science, technology, engineering, and math (STEM). Whether we’re planning a campus, designing a building, engineering a control tower, or calculating the materials required for elegant and long-lasting interiors, we’re applying STEM concepts every day. We bring creativity and innovation to each STEM task, and we believe the combination is a powerful one—not just in our field, but in multiple fields critical to our nation’s future. We encourage our designers and engineers to dream and envision, to think critically, and to always try new things, because history tells us that many of our nation’s most innovative solutions emerged from repeated experiments. Today technological tools like Building Information Modeling software allow us to experiment virtually—identifying a building’s design issues before construction ever begins. We think advancing technology will contribute in similar ways to our quest for sustainable building solutions.

For a building to succeed, every aspect of its design—from how it is structured to the size of its mechanical systems to the materials used—must be integrated and harmonious. And because each of a building’s elements are designed and configured by different professionals—an architect for one, an engineer for another—such integration requires constant collaboration. We determined long ago that multidisciplinary project teams—whose members sit together and talk with each other—head off potential design issues before they become problems. And that makes a client’s project smooth and headache-free. Our firm pioneered this STEM-friendly way of working in the architectural industry, and we apply it successfully in other areas—such as cross-company training, development, and a Leadership Institute involving team members from every department, role, and responsibility level.

We believe strongly in the role of STEM in everything we do, and we invest accordingly in programs that educate and train the professionals we want to hire. Through our nearly 100 years in the architectural, engineering, and interior design business, we’ve sent cadres of LEO A DALY volunteers into STEM classrooms to serve as teachers and mentors; we’ve provided job shadowing to any student eager to observe our work and how we go about it. We’ve also committed steady financial support to STEM endeavors; for 40 years we’ve contributed funding for an international scholarship within the University of Nebraska’s school of architecture (we have been headquartered in Omaha since our company’s founding there), and we support the Society of American Military Engineers’ mentoring program, a natural fit for a firm like ours who regularly partners with the Federal government on veterans’ hospitals and other facilities. Our executives have also been active in raising nearly $2 billion in funds for the University of Nebraska, an amount which includes $8 million dedicated to the school of architecture and engineering.

We’re very proud of one STEM initiative in particular—our support of the Peter Kleiewt Institute, a high-technology learning and research institute that is home to 1500 students from two University of Nebraska colleges—Engineering and Sciences and Technology. An important part of the Institute’s mission is to develop a high-tech workforce to meet industry, business and government needs, and we consistently hire well-trained Kleiewt graduates. But we don’t just hire Kleiewt grads—we put them to work on projects that are proof of the value of the curriculum. This year the Institute recognized LEO A DALY with its Architectural Engineering Outstanding Alumni Award for that very reason. We’re a longtime supporter of the Kleiewt Institute in other ways as well: a LEO A DALY exec serves on the Institute’s professional advisory board and on its entrepreneurial awards program board, which evaluates applicants largely on STEM criteria.

When it comes to promoting STEM education, we acknowledge our bias for architecture and engineering. We believe in the strength, beauty, and appropriateness of a well-designed building, we thrive on making them a reality for each of our clients, and we think there is nothing more exciting than doing so. But it isn’t just our conviction for what we do that attracts the future generation of architects and engineers to our field and our firm. It’s our willingness to lead by example, to actively engage in STEM education, and most importantly to offer varied career paths and worldwide work opportunities. We succeed by hiring smart, well-educated students—men and women who are minority—women who are men—who are native to the design world as we are—and by putting them to work on projects that use their knowledge and ideas. We value their skills, talent and enthusiasm, and there’s no bigger draw than that.
Marilyn A. Hewson
Chief Executive Officer and President
Lockheed Martin Corporation

Headquartered in Bethesda, Md., Lockheed Martin is a global security and aerospace company that employs about 118,000 people worldwide and is principally engaged in the research, design, development, manufacture, integration, and sustainment of advanced technology systems, products, and services. The Corporation’s net sales for 2012 were $47.2 billion.

As a member of the community, Lockheed Martin strives to be a valued partner to our neighbors, our nation and our ally countries. The Corporation supports a wide range of diverse and sustainable STEM activities that reach educators and students from elementary school through college. As an industry leader, Lockheed Martin is proud to do its part to ease the nation’s looming shortfall in technical talent.

Why do you believe STEM Education/workforce development is critical to our nation’s future?

As a generation of scientists, engineers and mathematicians begins to retire, the important technological positions they leave are becoming increasingly difficult to fill with new talent. To remain competitive, the United States must recognize this gap and emphasize the importance of STEM education and careers. Success depends on collaboration among industry, educators, policy makers and families. As an industry leader, Lockheed Martin is committed to working with these groups to develop programs that educate and inspire tomorrow’s scientists, engineers and mathematicians. Our future success—and our nation’s technological advantage—depend on a constant supply of highly trained, highly capable technical talent. As a corporation, we are committed to supporting programs, events and campaigns that focus on student achievement and teacher development to further STEM education.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

We need to show them how rewarding a STEM career can be. Earning a degree in science, technology, engineering and math can be challenging and requires a difficult course load in high school and college. It’s not easy, but it will prepare them for an extremely rewarding and exciting career. At Lockheed Martin, our engineers, scientists and mathematicians make a difference every single day. They lead the industry in innovation—from interplanetary space travel—to fighting cyber criminals—to building the world’s only multi-mission 5th generation fighter jet. As industry leaders and role models, we need to help students from all backgrounds see the benefits of pursuing these careers, the importance of this work to our nation, and how fulfilling it can be.

We also need to break down the stereotypes that sometimes discourage women and minorities to pursue these vital careers. We need to show them how rewarding a STEM education can be for women and underrepresented minorities.

What STEM initiative that your company has participated in are you most proud to support?

At Lockheed Martin, we support a variety of STEM initiatives and organizations. We are especially proud of Engineers in the Classroom, our K-12 STEM education outreach initiative, which includes programs like FIRST Robotics, Team America Rocketry Challenge, 4-H Robotics Clubs, and Project Lead The Way. Each of these programs enables Lockheed Martin engineers to work directly with students, which benefits both the students and our employees, who love to share their passion about their profession. By directly engaging in fun, hands-on activities, we hope to educate and inspire students to pursue STEM careers.

How is your company connecting diversity initiatives with STEM initiatives? Is this part of a comprehensive strategy?

We recognize women and minorities are underrepresented in STEM fields. As an example, we know that of all the women who seek a STEM education, only 26 percent of them achieve STEM careers. We cannot afford to leave this kind of talent on the table.

Ensuring we have the necessary talent to continue to innovate is imperative. So for us, there’s a critical connection between our company’s diversity initiatives and our STEM initiatives, which is an intentional component of our overall strategy. We see great value in aligning these initiatives and seek non-profit partnerships that successfully support women and underrepresented minorities pursuing STEM fields.

Where do you see the biggest area of opportunity in advancing STEM jobs/careers?

We need more mentors and role models for our students... people who can advise them about a STEM career and help them get on the right track. We also need to identify and communicate more success stories that students can relate to. They need to be able to see themselves in a STEM career, and that requires showcasing people who have had success in STEM careers. Teachers also play a vital role. We need to provide teachers with tools to spark the imaginations of young students and show them that STEM is fun and rewarding. Simply put, it takes lots of good people who can interact with students and guide them toward a STEM career.
Ajay Banga
President and Chief Executive Officer
MasterCard

MasterCard is a technology company in the global payments business. We connect consumers, financial institutions, merchants, governments and businesses worldwide, enabling them to use electronic forms of payment instead of cash and checks. We use technology and data-driven insights to make electronic payments more convenient, secure and efficient for people everywhere. MasterCard does not issue cards, but develops advanced payment solutions and seamlessly processes billions of transactions around the world every year. Our business has a global reach—extending to more than 210 countries and territories—and continues to experience growth in a world where 85% of retail transactions are still made in cash and checks.

Why do you believe STEM Education/workforce development is important for our nation’s future?

It was STEM-related fields that drove much of the U.S. excellence and prosperity in the 20th century. From the Model T to building the interstate system to space exploration. And there’s no question, the fields that make up STEM are even more critical to U.S. success in the 21st century. They’re the very ones driving U.S. innovation, productivity, and global competitiveness. We see them at work across the spectrum of U.S. products from robotics to defense avionics to social media. In short, STEM education is one of our lifelines to the future. Yet, in study after study, younger people in America are ranking below other developed countries in science and math. So much so, we’re in a position where our competitive advantage is being threatened. That has to change and that’s why STEM remains so vital.

Beyond Standards, what are the first steps we should take to curb the STEM education crisis?

One of the key first steps is to rethink how math and science are taught at an early stage. How we teach these disciplines must spark the curiosity of younger students. At the same time, it must also create the building blocks of critical thinking necessary for success in higher education and after that in the marketplace. And the onus isn’t just on schools. We can’t, of course, overstate the critical role of parents in encouraging their kids to pursue STEM opportunities and for parents to remain actively engaged in their kid’s STEM learning to ensure excellence. In addition, the solution requires active partnership between public and private sectors and from organizations dedicated to STEM education like STEMconnector®.

What principles do you apply to your professional and personal life to advance STEM education?

I believe that good intentions must translate into action and commitment. That belief applies in both my professional and personal life and it’s at the center of my advocacy for STEM education. That’s why I served on the Board of the NY Hall of Science and became directly involved in one of their innovative programs—the Science Career Ladder. This science education program recruits and trains high school and college students to serve as “Explainers.” They receive training in science, education and public speaking. Then they take that training and apply it, speaking to students about the exhibits, conducting demonstrations, and helping design educational programs and events. Students mentoring students, students inspiring other students, and students learning and giving back—all make for a win, win, win combination.

What is the STEM initiative your company has supported that you’re the most proud of?

STEM skills are critical to our success as a company as well as the broader payments industry, and I am proud of the actions we are taking at MasterCard internally and externally. Internally, we’re hiring recent college graduates who are strong in the STEM skills, and to that support effort, we have an internship program that targets rising juniors with STEM-focused majors.

From May to August, these students are engaged in technology projects in different parts of the MasterCard organization to learn more about the business. Externally, MasterCard seeks out and participates in a range of STEM-related activities and initiatives. We encourage MasterCard employees to volunteer as mentors, judges, and general support for regional and international competitions for the For Inspiration and Recognition of Science and Technology (FIRST) organization. We also look for opportunities to support professional development for teachers, because we recognize that ensuring the best classroom experience possible requires teachers to have their skills continually honed, nurtured, and appreciated by equipping them with current best practices.

What is your advice to those involved in promoting STEM education?

My advice is two-fold: first, remember it’s these disciplines that are essential for everyday economic advancement and human progress. Second, make learning fun. Make it experiential. That’s how you enhance and improve school curriculums. And to do that you need people educated in these disciplines and well-equipped with STEM skills. A Masters or PhD isn’t necessary. What’s key is having the right academic orientation and value placed on these STEM fields early on in education. And permeating it all must be a contagious enthusiasm for the fields that make up STEM.

Mr. Banga was named to the Board of Directors of The Dow Chemical Company in 2013. He is currently chairman of the U.S.-India Business Council. He also serves as a member of the Executive Committee of the Business Roundtable and chairs its Information and Technology Initiative. In addition, he is a member of the Council on Foreign Relations, the International Advisory Board of the Moskov School of Management (Skolkovo), The Economic Club of New York, The Financial Services Roundtable and the board of the New York City Ballet. He also is a fellow of the Foreign Policy Association.

From 2007 to 2012, Mr. Banga served on the board of directors of Kraft Foods. He has also served on the board of trustees of the Asia Society, the New York Hall of Science, and the National Urban League, among others. He received a B.A. in Economics from Delhi University and is an alumnus of the Indian Institute of Management, Ahmedabad.
Selleck joined Michelin in 1982, and trained for nine months to become an industrial engineer. As a platoon leader and a company commander in the 4th Infantry Division, where he served, he recognized the importance of developing the future workforce needed to compete in a global marketplace.

Selleck became chairman and president in October 2011. He is responsible for the coordination of all operations of the Michelin Group in North America (United States, Canada and Mexico), consisting of 19 major manufacturing facilities, 22,000 employees and 2012 revenues of $10.76 billion.

Selleck holds degrees from the U.S. Military Academy at West Point, where he earned a B.S. in civil engineering and applied sciences, and Clemson University, where he earned an M.B.A. He began his career as an Army officer in the 4th Infantry Division, where he served as a platoon leader and a company commander, then, subsequently, served more than 20 years in the Army Reserves.

Selleck joined Michelin in 1982, and trained for nine months to become an industrial engineer with the company. He then held various positions in Michelin’s Greenville, S.C., passenger car and light-truck tire plant, eventually serving as plant manager for three years.

Selleck has also served as vice president of Michelin Tire Manufacturing in the U.S. and Canada, chief operating officer of Michelin Americas Small Tires, chief operating officer of the passenger car and light-truck tire replacement market in Europe, president of Michelin’s worldwide Truck Tire business.

Selleck is passionate about Michelin’s community relations efforts aimed at introducing young students to manufacturing in the 21st century. He speaks regularly about the importance of developing the future workforce needed to compete in a global marketplace.

Why do you believe STEM Education/workforce development is critical to our nation’s future?

The long-term success of our nation will require more people with STEM backgrounds; therefore, it’s important that we encourage our young people to pursue a future in these fields. When looking at manufacturing as an example, 30 years ago a young person could start as a production worker without a high school diploma and the job didn’t require critical skills such as problem solving. Companies hired and relied on engineers or managers for those skills, not expecting them from those individuals lower down the chain. Today’s manufacturing environment requires all of our production and maintenance technicians to have a significant range of skills and problem solving abilities. The expectations of manufacturing employees, even at the entry level, have been elevated.

Failing to develop our nation’s future workforce will force companies to look overseas for talented individuals who can do the job.

What traits do corporate leaders need to effectively support and advance STEM education today?

We need to be able to articulate what careers in these fields look like today and become personally involved in education. From college and technical schools to high school and middle school, they need to understand what a STEM career path might offer. Today’s manufacturing environment is much different than it was in the past. The skill sets required are different, the technology is highly advanced and there are countless opportunities for a long-term career, but young people need to understand what those opportunities are.

How has your corporation coordinated investments in education with future workforce needs?

Back in the 1970’s when Michelin chose to establish its North American base in South Carolina, we were attracted by the state’s technical school system and the strong, work-ready labor force it produced. Today, we work closely with the tech schools to help them evolve and adapt their curriculums to meet the hiring needs of companies such as Michelin. We also have programs that allow us to interact with students as young as middle school to educate them on possible STEM careers. For example, we open up our facilities to parents, teachers, administrators and students so they can understand the important jobs we have waiting for them.

What is the key to smart STEM investments?

What industry can contribute goes well beyond our ability to write checks. We need to get involved and be role models for students. Connecting a middle school student with a young engineer just getting started in her career and who can share her personal story is a powerful way to enlighten a young person and impact his or her future decision making. It becomes tangible.

Committing to a STEM education isn’t the easy road, but it is very rewarding. Students should know that STEM fields are challenging to pursue, but their extra effort will be rewarded over time.

What is your advice to those involved in promoting STEM education?

Strike the right balance between technical and personal skills. There are numerous textbook skills that a student must master in order to become a successful scientist, technician or engineer. But at the same time, the ability to collaborate with other people, adapt to different personalities and succeed in groups is equally important. One of the underappreciated strengths of the American education system is the social skills and teamwork mentality that students obtain through athletics or other curricular activities. Of course, a student’s intellectual development should always be the emphasis, but we shouldn’t forget that soft skills play a role in how successful one can become. We don’t want to discourage kids from dreaming about becoming a professional athlete or performing in the arts, but everyone needs a backup plan. A STEM background is an incredible Plan B for many students.

What do we need in the US to continue to be at the top of global innovation?

We need our education system to produce well-educated scientists and engineers. For each one we produce, the potential innovation power of our country is increased.

How is your company connecting diversity initiatives with STEM initiatives? Is this a part of your comprehensive strategy?

Michelin’s Technical Scholar program focuses on the recruitment of women and minorities to the manufacturing field. This program allows currently enrolled technical school students to co-op with Michelin in our facilities so they can experience the real world application of their studies. We pay for their books and tuition, and the scholars are paid to work 20 hours a week with Michelin technicians. Upon successful completion of their education, Michelin Technical Scholars are often hired into our company for a full-time position with a starting salary around $50,000.

This program allows us to combine our commitment to diversity with our effort to continuously fill our employment pipeline with talented individuals.

Pete Selleck
Chairman and President
Michelin North America, Inc.

Dedicated to the improvement of sustainable mobility, Michelin designs, manufactures and sells tires for every type of vehicle, including airplanes, automobiles, bicycles, earthmovers, farm equipment, heavy duty trucks, and motorcycles. The company also publishes travel guides, maps and atlases covering Africa, Asia, Europe and North America. Michelin is recognized as the leading innovator in the tire industry. The Michelin brand is the top selling tire brand worldwide. Worldwide sales for the Michelin Group were 21.4 billion euros in 2012. Sales in North America in 2012 were $10.76 billion. Headquartered in Greenville, S.C., Michelin North America employs approximately 22,000 people and operates 19 major manufacturing plants in 16 locations across the United States, Canada and Mexico.
Steve Ballmer is CEO of Microsoft Corp., headquartered in Redmond, Washington. He joined Microsoft in 1980 and was the company’s first business manager. Before becoming CEO in 2000, his roles at Microsoft included senior vice president of systems software, and senior vice president of sales and support, and services that people love and businesses realize their full potential. Microsoft YouthSpark is a companywide initiative designed to create opportunities for hundreds of millions of youth around the world. Through partnerships with governments, nonprofit organizations, and businesses, we aim to empower youth to imagine and realize their full potential by connecting them with greater opportunities for education, employment, and entrepreneurship. In short, we want to empower youth to change their world.

Founded in 1975, Microsoft (Nasdaq “MSFT”) is the worldwide leader in software, services and solutions that help people and businesses realize their full potential. Microsoft YouthSpark is a companywide initiative designed to create opportunities for hundreds of millions of youth around the world. Through partnerships with governments, nonprofit organizations, and businesses, we aim to empower youth to imagine and realize their full potential by connecting them with greater opportunities for education, employment, and entrepreneurship. In short, we want to empower youth to change their world.

Steve Ballmer was born in March 1956, and he grew up near Detroit, where his father worked as a manager at Ford Motor Co. Ballmer lived down the hall from fellow sophomore Bill Gates at Harvard University, where he graduated with a bachelor’s degree in mathematics and economics. He worked for two years at Procter & Gamble Co. as an assistant product manager and attended Stanford University Graduate School of Business before joining Microsoft.

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Why do you believe STEM Education/workforce development is critical to our nation’s future?

As high-skill jobs represent an increasing share of our country’s workforce and national output, investments in STEM education are critical for sustaining America’s ability to compete in the global economy. STEM education is also critical to helping young people overcome the opportunity divide, an increasing gap between those with the skills needed to compete and those left behind because they lack the education, skills and real world opportunities to succeed. At our current rate, the United States will not even produce half of the computer science graduates needed to fill open computing positions. By investing in STEM education, we can sustain American competitiveness while ensuring students have the skills they need to succeed.

How do you believe STEM education can improve a nation’s competitiveness?

STEM education is a win/win for a nation’s economic competitiveness. By further investing in STEM, the U.S. can help fuel innovation and economic growth. STEM jobs are among the fastest growing and highest paying occupational groups. Looking at where the global marketplace is right now and where we are headed, the imperative is simple: if we do not improve access and attainment in STEM, the U.S. will continue to fall behind other nations. For example, engineering degrees represented 4% of all Bachelor's degrees awarded in the U.S. in 2009. In Asia, that figure was 19%, and in China, 31%. These trends must change in order to sustain U.S. competitiveness.

Beyond Standards, what are the first steps we should take to curb the STEM education crisis?

Beyond setting standards, the first step we should take to strengthen K-12 STEM education is to provide additional resources to recruit and train STEM teachers.

Next, the U.S. should broaden access to computer science courses in high school to ensure that all students have the opportunity to gain this foundational knowledge and explore careers in computing. Although computing occupations will comprise approximately half of all STEM jobs by the end of the decade, today fewer than 1 in 10 high schools in America offer computer science classes. In 2011, only 2,100 out of the nation’s 42,000 high schools offered an Advanced Placement (AP) computer science course, and AP computer science exams represented only 0.6% of all AP tests taken that year, down from 1.6% in 2000. By ensuring students have access to computer science, our nation can begin to address the opportunity divide and help ensure students have the skills needed to succeed.

Finally, we must address our national crises in college completion by helping students who start college to finish it faster while also expanding higher education capacity to produce more STEM degrees, with a particular focus on computer science. Through taking these steps, we can help young Americans overcome the opportunity divide to ensure they have the skills necessary to succeed.

How has your corporation coordinated investments in education with future workforce needs?

Last year, Microsoft was proud to launch YouthSpark, a companywide initiative designed to create opportunities for 300 million youth around the world over the next three years. Through partnerships with governments, nonprofits and businesses, we aim to empower youth to imagine and realize their full potential by connecting them with greater education, employment, and entrepreneurship opportunities.

What do we need in the US to continue to be at the top of global innovation?

There are three key things the U.S. can do to maintain our edge as an innovative country. First, we need to continue to invest in human capital, particularly in STEM education, at the K-12 and higher education levels and through worker retraining. Second, we need to embrace a 21st century immigration framework that welcomes the best and the brightest from all over the world to build their businesses here. Finally, we need to coordinate our efforts, between government, industry, and the non-profit sectors as well as across industries.

What do you believe is your advice on using private-public partnerships to tackle our most pressing education challenges in STEM?

Microsoft is committed to facilitating public-private partnerships designed to increase educational opportunities and achievement. Through these partnerships we have learned that engaging key leaders, identifying mutually-beneficial goals, committing to a shared vision, and celebrating success along the way are keys to multi-sector partnership success. Microsoft remains a committed partner for progress, contributing strategic, long-term investments to provide more young people with the skills and opportunities necessary to succeed in STEM.
Mr. Grasso is responsible for developing and leading the organization’s overall strategic and business operations, including its federally funded research and development centers (FFRDCs). He also serves on MITRE’s board of trustees. Concurrent with his CEO responsibilities, Mr. Grasso is director of MITRE’s National Security Engineering Center, responsible for delivering transformational solutions for the Department of Defense and the Intelligence Community.

Mr. Grasso is dedicated to increasing opportunities for promising young people to study science, technology, engineering, and mathematics (STEM). He is a member of the Stevens Institute Systems Engineering Research Center advisory board, the University of Virginia’s Department of Systems and Information Engineering advisory board, and Howard University’s College of Engineering, Architecture and Computer Sciences board of visitors. Most notably, Mr. Grasso has for many years supported the efforts of the National GEM Consortium, a nonprofit that promotes the participation of underrepresented groups in post-graduate science and engineering education and the technical workforce. As part of our partnership, MITRE has proudly sponsored more than 73 interns, many of whom have been hired into permanent positions.

MITRE also supports a wide variety of community-based STEM initiatives. Key initiatives include providing summer jobs to high school and college students, including a dedicated Nanotechnology Student Program; participating in Leadership Initiatives for Teaching and Technology, which places school teachers in an externship program at MITRE to help them relate classroom curriculum to real-world workplace; and hosting Young Women in Engineering events, among many others. Throughout the year, our employees can also be found mentoring students in the community, serving as judges in science fairs and speaking at local schools.

Of which STEM initiatives that your company has supported are you most proud?

I am proud of the numerous STEM initiatives that MITRE participates in. If I had to choose one, I’d say that I am most proud of our Student Program. Every year, more than 200 students join MITRE in a co-op, internship or full-time job position—many of whom return year after year while completing their studies.

As part of our Student Program, students, ranging from high school to doctoral-level programs, are mentored by and work directly with our staff on a technical problem with real-world impact. While the majority of our students pursue education and training in computer science, computer engineering, and electrical engineering, we offer opportunities across numerous disciplines, including systems engineering, mathematics, aerospace engineering, cybersecurity, public health, physics and nanotechnology.

Within our Student Program, we also have a summer research program within our nanosystems group. In this program, nine to 12 students work in small teams and receive continuous mentoring. Many of these former students are now leaders in nanotechnology and related technical fields.

What do we need in the US to continue to be at the top of global innovation?

To continue to be at the top of global innovation, we must get and keep students interested in STEM fields. This starts by offering high-quality STEM education programs that engage students and demonstrate real-world applicability of what they are learning. Students who do not know an engineer, scientist or a STEM professional often do not know the wide range of opportunities that are available to them or present or how to develop a career plan. We need to ensure that all students have the opportunity to discover a passion for STEM fields.

To support these efforts, we need a comprehen- sive and collaborative effort across the public and private sectors that supports scholarships and academic programs aimed at increasing and maintaining participation in STEM disciplines. Strengthening the U.S. STEM pipeline is of critical importance, particularly to organizations that work on sensitive government projects and can only hire U.S. citizens, many of whom must be able to obtain high-level security clearances. Today’s STEM students—from kindergarten to doctoral programs—are tomorrow’s innovation and technology leaders.

How is your company connecting diversity initiatives with STEM initiatives? Is this a part of your comprehensive strategy?

At MITRE, we apply our expertise to provide guidance to address some of our government’s most critical needs. The best way to meet these needs and bring forward the most innovative solutions is to create highly skilled teams whose members have diverse experiences and perspectives.

To build these teams, we support a broad range of programs designed to encourage people, especially those from underrepresented groups, to pursue STEM fields. Notably, our employees are active participants of numerous STEM conferences, including the Society of Women Engineers Conference and Women in Technology Conference, and host Young Women in Engineering events. MITRE also actively recruits talent from underrepresented academic institutions, including Howard University and the University of Puerto Rico.

In recognition of our employees’ commitment to advancing diversity and STEM initiatives, the Black Engineer of the Year Awards, National Society of Black Engineers Conference and the Women of Color STEM Conference have recognized many of our engineers for their technical expertise and community involvement.
Irene Rosenfeld
Chairman and Chief Executive Officer
Mondelēz International, Inc.

Mondelēz International, Inc. (NASDAQ: MDLZ) is a global snacking powerhouse, with 2012 revenue of $36 billion. Creating delicious moments of joy in 165 countries, we’re a world leader in chocolate, biscuits, gum, candy, coffee and powdered beverages, with billion-dollar brands such as Cadbury, Cadbury Dairy Milk and Milka chocolate, Jacobs coffee, LU, Nabisco and Oreo biscuits, Tang powdered beverages and Trident gum. And we’re a proud member of the Standard and Poor’s 500, NASDAQ 100 and Dow Jones Sustainability Index. From investing in sustainable agriculture to eliminating waste and promoting healthy lifestyles, we’re reducing our environmental impact and enhancing our contributions to society, while delivering outstanding financial performance. Since October 2012, we’ve committed $600 million over 10 years through our Cocoa Life and Coffee Made Happy initiatives to build sustainable supplies, thriving communities and benefit millions of people in the developing world.

For more information, please visit www.mondelezinternational.com and www.facebook.com/mondelezinternational.

Irene returned to Kraft Foods, the predecessor to Mondelēz International, Inc., in June 2006 as CEO and became Chairman in March 2007, following Kraft’s spin off from Altria Group. Since that time, Irene has changed the face, footprint and prospects of Kraft Foods. She repositioned the company to deliver consistent top-tier growth by reinvigorating iconic brands, transforming the portfolio and strengthening the company’s presence in fast-growing developing markets. The transformation she led culminated in the spin-off of the company’s North American grocery operations and creation of Mondelēz International, Inc. in October 2012.

Irene began her career in consumer research, later joining General Foods, which itself became part of Kraft Foods. Irene led the restructuring and turnaround of key businesses in the United States, Canada and Mexico. She served on the team that spearheaded the company’s IPO in 2001, and successfully integrated the Nabisco, LU and Cadbury businesses.

Irene took a short break from Kraft Foods in 2004, serving for two years as Chairman and CEO of Frito-Lay. While there, she accelerated growth in better-for-you products and health and wellness offerings.

The “Financial Times,” “Fortune” and “Forbes” have repeatedly ranked Irene on their lists of the “Top 50 Women in Global Business,” “50 Most Powerful Women in Business” and as one of the world’s “100 Most Powerful Women.”

Irene holds a Ph.D. in Marketing and Statistics, an M.S. in Business Administration and a B.A. in Psychology—all from Cornell University. She is active in a number of industry and community organizations, including the Economic Club of Chicago. She also serves on the Board of the Consumer Goods Forum and Cornell’s Board of Trustees.

Why do you believe a STEM (Science, Technology, Engineering & Mathematics) Education and Workforce are important to our nation?

Innovation is critical for countries and companies to compete in the global economy. STEM fields help us to develop technology that translates into products consumers around the world want. As we continue to grow, we’re finding that engineering is a pinch point. We use engineers to develop and commercialize our new products, and finding qualified engineers is becoming more challenging. Since the U.S. only produces a small percentage of the world’s engineers, we have to focus our public policy on ensuring we can remain competitive.

What can we do to assure more women leaders in STEM?

We can encourage girls and young women to pursue math and science in grade school through high school. Unfortunately, there’s still too much peer pressure that makes excelling in math and science difficult for girls. Programs that show girls how STEM can be fun, both in and out of school, need to be prioritized. What’s more, girls and young women need visible positive role models. I’m proud that there are five women on my leadership team who serve as role models in our organization.

How is your company innovating to promote STEM?

Our company works to promote STEM both inside and outside of our workplace. Most schools where we recruit have a STEM component in their curriculum, and we partner with several diverse student groups on campus and mentor students. In addition, we’ve supported the Conrad Foundation’s efforts to spark students’ interest and promote careers in science and technology in the research and development field.

On the professional front at Mondelēz International, we’ve supported diversity efforts for many years. In our Research, Development & Quality function globally, we work hard to advance diversity, and our results show it in fact, more than half of our global RD&Q employees are women. In the U.S., we’re focused on increasing the number of women and people of color; outside the U.S., we’re focused on increasing the representation of women. And I’m proud that our executive incentive compensation is tied to performance in advancing our open and inclusive environment.

How can we do a better job to strategically coordinate all those engaged in STEM across the company? (Across different departments)

Supporting STEM activities can be specifically tied to diversity, and I’m passionate about making our workplace more diverse. To achieve our company’s goals, we need to attract, inspire and engage talented people from different backgrounds—in STEM and beyond—to access their creativity and encourage them to challenge us to raise our game. Diverse thinking enables us to create and build strong, relevant brands; tap multiple perspectives in search of good ideas; and makes us a great place to work! We also need to reflect the faces of our consumers in our employees, and especially in our leaders. That’s why “open and inclusive” is one of our core values guiding our employees. Diversity is about the perspective, capabilities, identity, experiences and style that make each of us unique. Being inclusive means proactively creating a culture where each colleague can comfortably contribute and reach his or her full potential, while helping to create delicious moments of joy for our consumers.

I’m proud of the excellent progress we’ve made in increasing the diversity of our workforce, and of the external recognition we’ve earned. And we kept our focus even as we created two new companies last year, maintaining or increasing the diversity of our salaried workforce worldwide.

“Innovation is critical for countries and companies to compete in the global economy.”
Hugh Grant is Chairman of the Board and Chief Executive Officer of Monsanto, an agricultural company that applies innovation and technology to help farmers increase yields while conserving more water, soil, energy and other resources.

Mr. Grant joined Monsanto as a product development representative in 1981. Since then he has served in a variety of product and management positions on three continents. He became Chairman, President and CEO in 2003. Brett Begemann assumed the role of President in 2012.

Under Mr. Grant’s leadership, Monsanto has developed and supported numerous programs to encourage the study of science, technology, engineering and mathematics, including the Monsanto Beachell-Borlaug International Scholars Program, which provides fellowship opportunities to highly motivated individuals pursuing doctoral degrees in rice or wheat plant breeding. The scholars gain leadership skills, education and tools needed to improve lives around the world by enhancing the future of rice and wheat production.

Mr. Grant is recognized internationally as a leader in the fields of science, innovation and technology. He serves on the boards of trustees of both Washington University in St. Louis and the Donald Danforth Plant Science Center and on the board of commissioners of the St. Louis Science Center. He is a member of the American Academy of Arts & Sciences.

Born in Larkhall, Scotland, Mr. Grant earned a bachelor’s degree in agricultural zoology with honors at Glasgow University. He also earned a post-graduate degree in agriculture at Edinburgh University and a master’s of business administration at the International Management Centre in Buckingham, United Kingdom.

**Hugh Grant**

**Chairman and Chief Executive Officer**

**Monsanto**

Monsanto Company provides technology-based solutions and products that improve farm productivity and food quality. The company’s vision is to help farmers produce more from their land while conserving more natural resources, such as water and energy.

By 2050, the world’s population is expected to grow from 7 billion to more than 9 billion. At the same time, individual incomes are expected to increase by such an extent that 3 billion additional people will join the middle class. To feed all these people, and to meet their rapidly changing diet expectations, global food production must expand by more than 70 percent. Monsanto’s products help farmers around the world meet this challenge and improve lives in a sustainable way.

To do that, Monsanto depends on a highly educated workforce of more than 22,000 employees in more than 70 countries. The company routinely hires professionals in such fields as plant science, engineering, research, and IT.

**Why do you believe STEM education and workforce development is critical to our nation’s future?**

As we look toward the future, our world faces serious challenges, including population growth, resource depletion and climate change. Confronting and overcoming these challenges will require bright minds and innovative ideas. Workers with skills in such fields as science, technology, engineering and math are essential to tackling these challenges and developing sustainable solutions for the future. These are exactly the types of employees the agriculture industry must attract to develop future generations of seeds, traits and products.

**How do you encourage students, particularly women and underrepresented minorities, to continue their study of STEM subjects?**

As early in life as possible, we need to introduce these students to the wide range of STEM education and career opportunities. That’s where programs such as Monsanto’s 1890 Student Leadership Program, which helps connect students at the Historically Black Land Grant Institutions with scholarship, internship, and career opportunities in agriculture, science, engineering, technology and related fields. We also need to provide support, guidance and encouragement to help each student excel to his or her full potential. Many young women and underrepresented minorities are interested in STEM fields, but they simply don’t see a personal pathway to higher education or a career in these disciplines. It’s our job to show young people that a rewarding STEM career is within reach.

**How has your corporation coordinated investments in education with future workforce needs?**

Monsanto’s workforce needs and our investments in STEM education are directly linked. As we look toward the future, recruiting and retaining high-quality STEM workers are among our most critical priorities. That’s why we have chosen to invest in programs and initiatives tied directly to education in these fields. Examples of these investments include our partnerships with groups such as 4-H and the National FFA Organization, which expose young people to the broad range of career opportunities within agriculture. By investing in these organizations, we’re developing a pipeline to meet agriculture’s needs for STEM talent in the years to come.

**Which of your company’s STEM initiatives makes you the most proud?**

Developing future generations of agriculture and scientific professionals is a proud part of our Monsanto heritage. Monsanto has a rich history of supporting education, especially in STEM fields, through company-funded programs and investments. One example is our Monsanto Beachell-Borlaug International Scholars Program. We founded this program in 2009 to honor the legacy of Dr. Henry Beachell and Dr. Norman Borlaug, two groundbreaking scholars in the field of plant breeding, and to nurture future plant scientists in developing countries. The scholars focus their research on two critical food-security crops, rice and wheat. This program provides generous support to students with tremendous potential and helps develop a pipeline of new talent not only for Monsanto but also for agriculture in general.

**What is your advice to those involved in promoting STEM education?**

As business and civic leaders, educators and policymakers, we all must understand that time is of the essence. We must come together to bring more young people—and especially women and underrepresented minorities—into agriculture, plant science and other STEM fields, and we must do so now.

Within agriculture specifically, the challenges of population growth and food security will continue to become more pressing, and new ideas and innovations are key. This is an issue that demands our urgent action.

**How is your company connecting diversity initiatives with STEM initiatives? Is this a part of your comprehensive strategy?**

At Monsanto, we see recruiting for STEM talent and recruiting for diversity as two sides of the same coin. Recruiting the best and brightest minds means that we must actively seek out talent from diverse backgrounds, regions, experiences and academic disciplines. For that reason, we have made diversity a cornerstone of our recruitment and development strategies. We strive to be a company where ideas flow freely and diversity thrives. That’s the only way we’ll successfully tackle the global challenges we face.

**How should those working to improve the STEM workforce measure success?**

Success in this area is very clear. We need more young people, not fewer, choosing to study and work in STEM fields. We can track our progress by degrees, graduation rates or whatever metric you’d like. But the fundamental measure of our success will be whether companies can recruit and retain enough workers with the high-tech skills and abilities demanded by the careers of tomorrow.
Greg Brown
Chairman and Chief Executive Officer
Motorola Solutions

Motorola Solutions connects people through technology. Businesses and government agencies around the world turn to Motorola Solutions innovations when they want highly connected teams that have the information they need throughout their workdays and especially in the moments that matter. You can find Motorola Solutions products and services in a wide range of workplace, from the retail floor to the warehouse floor, and from the smallest personal safety to the most secure government offices.

As a company driven by innovation, Motorola Solutions employees are motivated to help engage the next generation of inventors. Employee volunteers serve as robotics coaches, after-school tutors, student mentors and more. The Motorola Solutions Foundation’s Innovation Generation grants have provided more than $30 million in funding since 2007 to non-profit organizations that engage American youth in STEM fields, with the goal of inspiring them to pursue careers in engineering and technology. Twenty-two percent of our funding supports girls-only programs, inspiring them to pursue careers in engineering and technology.

How do you believe STEM education can improve a nation’s competitiveness?
Science and technology innovations are important in shaping how we interact in society and have a big impact on our daily lives. In IT-related fields alone, 93 percent of employers think their IT staffs could use better training. The STEM disciplines encourage young people to think differently about big questions, to solve problems in new and different ways. With a new generation of critical thinkers, we can solve the big problems facing our nation and the world—from global warming to cybersecurity and from space exploration to feeding the world.

What traits do corporate leaders need to effectively support and advance STEM education today?
The STEM disciplines are changing rapidly. Leaders have to advance STEM education to create a pipeline they can use to continually renew their companies with current and fresh ideas. For technology companies, this constant inflow of knowledge and capability is their lifeblood—more crucial than any other supply chain. Leaders cannot afford to ignore this but have to cultivate it.

How can we do a better job to strategically coordinate all those engaged in STEM across the company?
It’s critical to get employees involved. When employees experience first-hand the joy of engaging a student in a field that could affect his or her future, they can’t help but get excited. Ongoing mentorship programs and after-school activities are a good way to do this, but one-day classroom volunteer events can have an immediate impact too. Our employees volunteered more than 55,000 hours in their communities last year. Many of those hours were spent working with students on STEM projects. This inspired the students to enter STEM careers, and also inspired many of our employees to believe in the importance of the work we do.

What do corporations need to do to create more STEM careers and fill existing jobs?
American industry has changed dramatically in the last 20 to 30 years, and so have the required skills sets of employees. Businesses need a pipeline of talented individuals to fill those roles. The engagement needs to start before the college level, get diverse students excited and engaged in high school and even in elementary school. College internships also are very powerful in advancing STEM. The individuals get to balance academic learning with a taste of the real world. This shapes their learning academically and helps them make informed decisions about what will make them most fulfilled in a STEM-related career. It also is important for American businesses and colleges to work together to provide unique solutions that help businesses thrive and keep college relevant.

How has your corporation coordinated investments in education with future workforce needs?
One example is our partnership with the local community college that is located just two miles from our global headquarters. We provide scholarships for traditional and adult students; monetary awards for distinguished faculty; grant funding for and employee engagement in a summer bridge program for at-risk students; and customized training by Motorola Solutions professionals. This support has provided students and the college with opportunities and helps the college stay connected to our workforce needs in a fast-changing, global environment. We also engage in funding and co-research with several universities, which creates linkage between academia and business application of technology and establishes pipelines of relevant talent.

Where do you see the biggest area of opportunity in advancing STEM jobs/careers?
More STEM professionals need to get involved in sharing their stories. That’s where it has to start. When scientists, engineers, astronauts and mathematicians get involved with our youth and promote the importance of their jobs and the impact they are making on the world, young people take notice. This type of engagement appeals to the idealism and optimism of youth and helps them form their own path for how they can change the world through science and technology. Role models and firsthand experiences can make what might seem lofty career goals—or even a minor interest—suddenly seem relevant, possible and even really fun.

Greg Brown is chairman and chief executive officer of Motorola Solutions, the leading provider of mission-critical communications solutions for government and enterprise customers.

As the leader of an engineering-based company, Brown knows first-hand the importance of the STEM fields to American innovation. With his guidance, the Motorola Solutions Foundation focuses its funding on programs that engage students in hands-on, creative STEM programming.

Brown joined Motorola in January 2003 and was elected to the company’s board of directors in 2007. He became CEO of Motorola in January 2008 and led the successful spin-off of the consumer-focused Motorola Mobility in 2011. Prior to joining Motorola, he was chairman and CEO of Micromuse Inc. from 1999 to 2003.

Brown serves as deputy chair of the Reserve Bank of Chicago, and recently was chairman of the board of the Commercial Club of Chicago, World Business Consultants Group, and Technology CEO Council. Additionally, Brown is a member of the Northwestern Memorial Hospital Board, the Civic Committee of the Commercial Club of Chicago, World Business Chicago, and is vice-chair of the Executives’ Club of Chicago. Greg also is on the advisory board for the Aspen Institute’s Skills for America’s Future program, which is helping community colleges develop educational programming that matches employers’ needs.

He has served two American presidents, most recently as a member of President Obama’s Management Advisory Board. In 2004, President George W. Bush appointed Brown to the National Security Telecommunications Advisory Committee (NSTAC). He earned a bachelor’s degree in economics and an honorary doctorate in humane letters from Rutgers University, and also serves on the university’s Board of Governors.
Thomas B. King
US President
National Grid

National Grid is an electricity and gas company that connects consumers to energy sources through its networks. The company is at the heart of one of the greatest challenges facing our society—to create new clean energy solutions for the future and developing an energy system that underpins economic prosperity well into the 21st century.

While we depend on engineers to shape the future of energy, we find ourselves facing a shortage of engineers entering the workforce. So we are preparing today for tomorrow’s engineering workforce.

Our “Engineering our Future” initiative aims to inspire male and female, middle, high school and college students to develop STEM skills and consider careers in engineering. Through our Engineering Pipeline Program and financial and mentoring support of multiple STEM programs in our service areas, we are welcoming the next generation of diverse engineers.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

When students show an interest in STEM, it’s imperative to stoke the fire. There’s no better way to encourage future study than by offering extracurricular programs with interactive, hands-on activities, mentoring, and leadership building.

As an example, we partner with Girls Inc. because we believe in their Eurekaw and Operation SMART programs, both of which encourage girls to explore education and career paths in STEM fields. Our financial and mentor support help with outings, projects and special events that get girls thinking like scientists. The way we see it, we’re helping to educate our future workforce.

What traits do corporate leaders need to effectively support and advance STEM education today?

As corporate leaders, we need to align with the forward-thinking teachers out there that are promoting STEM in early childhood education. That means inspiring a thirst for learning, encouraging creative problem-solving skills and role modeling diverse and inclusive behavior—with both our current and next-generation workforce.

What do corporations need to do to create more STEM careers and fill existing jobs?

“If you build it, they will come.”

It’s about being pro-active—understanding what you need and working as a team to make it happen.

We launched our Engineering Pipeline Program to attract high school juniors interested in STEM, and see them through to a career in engineering. It’s an innovative program that spans six years, starting with exploring the engineering and energy industry and culminating, we hope, with a job at National Grid following college graduation.

What STEM initiative that your company has supported are you most proud?

I am proud of all the programs we sponsor and especially those where our employees personally get involved, such as FIRST Robotics and Operation SMART.

On the home front, I am most passionate about our Engineering Pipeline Program. This initiative really signifies our commitment to a future dedicated to energy conservation, a low carbon economy, and solutions around climate change.

In addition, we have programs to support underrepresented minorities.

The enthusiasm that high school students bring into the Company is contagious. Seasoned employees probably get as much out of the mentoring, job shadowing, social networking and internships that the students themselves do.

The program is a structured six-year journey, and we’re in year four with our first group of 50 young men and women. More than 120 students have entered the program since its inception in 2010. It’s exciting to be part of their learning and watch them grow. I look forward to the day when we welcome the first program graduates as National Grid employees.

Where do you see the biggest area of opportunity in advancing STEM jobs/careers?

We will continue to see opportunities abound in energy utilities for years to come.

Energy is on the public agenda—expectations for reliability, efficiency and safety are only increasing. The utility industry is facing a lot of challenges, including renewable energy, a knowledge gap, aging infrastructure and equipment, generation operations and cyber security.

At National Grid, we feel a great responsibility for delivering the energy systems of the future and we can only accomplish this by advancing STEM jobs/careers.

What do we need in the US to continue to be at the top of global innovation?

During his State of the Union address earlier this year, President Obama voiced his support of Energy 2030 and set a new goal for America. He is challenging all Americans, over the next 20 years, to increase our energy productivity by cutting in half the energy homes and businesses waste.

Furthermore, the President has promised federal support for the states that come up with the best ideas to save energy, like creating new jobs and constructing energy efficient buildings.

Clearly, we have the incentives to stay at the top of global innovation. Our next step is to inspire everybody—from families, to students, to small business owners, to big corporations—to do their part.

Tom King joined National Grid in July 2007 as Executive Director, Electricity Distribution & Generation, and as President of National Grid US. Prior to this time, Tom was President of PG&E Corporation and Chairman and CEO of Pacific Gas and Electric Company from 2003-2007. Before that, he served as Senior Vice President of PG&E Corporation, and as President of PG&E National Energy Group, having joined PG&E Gas Transmission as President in 1998.

Prior to PG&E, he served as President and Chief Operating Officer of Kinder Morgan Energy Partners. He previously spent eight years, from 1989 to 1997, in a series of senior operating positions with Enron Liquid Services, Northern Natural Gas Company, Transwestern Pipeline Company and Northern Border Pipeline Company. He also held positions at Cabot Corporation’s natural gas unit, Cabot Transmission Corporation, and the Panhandle Eastern Corporation.

Tom serves as the Chairman for the Alliance to Save Energy, as a board member for the Business Council of New York State and the Edison Electric Institute, as well as serving on the Board of Trustees for the New England Aquarium, the Board of Selectors for the Jefferson Awards, and is co-chair of the National Utilities Diversity Council.

Tom was awarded a bachelor’s degree in business administration from Louisiana State University and is a graduate of the University of Michigan’s executive management program. He also successfully completed the Nuclear Reactor Technology Program at the Massachusetts Institute of Technology.

Tom currently resides in Weston, Massachusetts, with his wife Michelle and three daughters.
Dr. James Truchard
Co-founder, President and
Chief Executive Officer
National Instruments

National Instruments equips engineers and scientists from kindergarten to rocket science with tools that accelerate productivity, innovation, and discovery.

Since 1976, NI has developed integrated hardware and software platforms that revolutionized the way their more than 35,000 customers address challenges through the accelerated development of any system needing measurement and control. Through a long-term vision of graphical system design and deep commitment to created shared value, NI fosters the success of customers, employees, suppliers and shareholders while making a positive impact on society.

The company’s long-term vision and focus on improving society through its technology has led to strong, consistent company growth.

Named an Innovation Agent by Fast Company, James Truchard, president and CEO, cofounded National Instruments in 1976 and has pioneered the way scientists and engineers solve the world’s grand engineering challenges.

Under Truchard’s leadership, National Instruments equips scientists and engineers with tools to accelerate productivity, innovation and discovery from kindergarten to rocket science.

As one of Forbes’ America’s Favorite Bosses, Dr. James Truchard, commonly known around NI as Dr. T, has led the company from a three-man team to a multinational organization recognized as a Fortune 100 Best Places to Work and one of the top 25 “World’s Best Multinational Workplaces” by the Great Places to Work Institute.

Elected to the Royal Swedish Academy of Engineering Sciences and the National Academy of Engineering, Truchard has also been inducted into Electronic Design’s Engineering Hall of Fame.

Truchard’s personal passion for addressing the declining interest and preparation of young people to pursue careers in technical fields has led him to dedicate time, technology, and donations to organizations including the Engineering Foundation Advisory Council, The University of Texas at Austin Cockrell School of Engineering, Austin Technology Council, and FIRST Robotics.

Additionally, Truchard has been recognized with the Woodrow Wilson Award for Corporate for his work with science, technology, engineering, and math (STEM) organizations. Truchard earned his master’s and doctorate degrees while working full-time as the managing director of the acoustical measurements division at the UT Applied Research Laboratories.

Why do you believe STEM Education/workforce development are critical to our nation’s future?

NI mentors worked in 141 classrooms, teaching 3,162 students engineering, math, and science skills. NI mentors mentored more than 12,000 students.

What area of STEM are you most passionate about?

NI has a long history partnering and powering student robotics competitions that make engineering as cool for kids as sports are today while teaching core engineering concepts, problem-solving skills, and leadership principles. NI plays a critical role in these events, from leadership and logistics to providing the technology platform powering the competitions, which are linked directly to growing the number of students who pursue careers in engineering and science. NI serves as a long-term, strategic partner for the global organizations managing these competitions. Two of the most significant partnerships are with For Inspiration and Recognition of Science and Technology (FIRST) and the World Robot Olympiad (WRO).

We have to engage students…to allow them to focus on actually doing engineering and solving real world problems.…"
Mr. Moorman serves on the boards of the Association of American Railroads and the American Coalition for Clean Coal Electricity. He is on the boards of Chevron Corporation, The Nature Conservancy of Virginia, the Chesapeake Bay Foundation, and the Eastern Virginia Medical School Foundation, and is a member of the Business Roundtable, the American Society of Corporate Executives, and the Business Council. In addition, he is a member of the International Energy Agency Coal Industry Advisory Board.

Mr. Moorman’s background demonstrates the value he places in science, technology, engineering, and mathematics. He supports the STEM education effort to ensure our country remains a leader in technological innovations.

Norfolk Southern Corporation (NYSE: NSC) is one of the nation’s premier transportation companies. Our Norfolk Southern Railway Company subsidiary operates approximately 20,000 route miles in 22 states and the District of Columbia, serves every major container port in the eastern United States, and provides efficient connections to other rail carriers. We operate the most extensive intermodal network in the East and are a major transporter of coal, automotive, and industrial products.

Norfolk Southern is the fourth largest U.S. railroad and traces its history back to 1877 and the earliest days of railroad and modern-style commerce in America.

The railroad is an engine for economic growth. In the last decade, we helped 1,021 new and expanded facilities locate along our lines, generating 48,000 jobs and representing $28.7 billion in customer investment. America’s railroads are a growth industry, and Norfolk Southern seeks qualified individuals proficient in all areas of STEM to fuel our business and the economy.
Northrop Grumman Corporation

Wes Bush
Chairman, President and Chief Executive Officer

Northrop Grumman is a leading global security company providing innovative systems, products and solutions in unmanned systems, cyber, C4ISR, and logistics and modernization to government and commercial customers worldwide. The Northrop Grumman Foundation, a charitable giving arm of Northrop Grumman Corporation, is committed to supporting diverse and sustainable programs that create innovative education opportunities for our nation’s youth. The priority is to provide assistance to national-level STEM programs that span pre-school and elementary school through collegiate levels and put an emphasis on reaching diverse populations. Northrop Grumman employees actively volunteer in support of many STEM organizations, causes, and programs for local youth. They also donate to local schools to provide them with high-quality STEM materials and resources. In 2012, Northrop Grumman continued its outreach efforts to support STEM. The Northrop Grumman Foundation donated approximately $33.5 million to philanthropic organizations. Of that, approximately $22.8 million went to STEM-related groups.

Why do you believe STEM Education/workforce development is critical to our nation’s future?

Across the country, the number of young students interested in STEM falls short of the projections of the talent our nation will need to propel our economy. This is causing a growing shortage of STEM-based talent in our workplaces and universities, and it represents a serious problem for our nation. STEM-based expertise is at the heart of our high-technology culture, society and economy. If we are not able to draw on a substantial and growing infusion of that expertise, America will be unable to sustain its leadership position in an increasingly competitive world. Beyond Standards, what are the first steps we should take to curb the STEM education crisis?

A critical step in building a diverse, STEM student pipeline is making science and math fascinating and applicable for students. We must particularly reach out to women and minority students, where the lack of STEM involvement is detrimental to our society. To do that, we need to support educators who are excited about what they do and can bring unique learning opportunities into their classroom. That is where Northrop Grumman has focused its efforts.

What is the STEM initiative that your company has supported are you most proud?

I am very proud of all our STEM activities and also the involvement of our employees. For example, in support of teacher development, last year we donated $1 million to George Mason University for the Virginia Initiative for Science Teaching and Achievement program. The five-year effort focuses on high-need schools to improve science teaching, student learning and professional development of elementary and secondary teachers throughout Virginia. This is our second year, in collaboration with Conservation International, supporting ECO Classroom. It’s a unique program assisted by the Northrop Grumman Foundation, that gives science teachers an intensive, two-week program in Costa Rica designed to stimulate their knowledge and interest in environmental science, and prepare them to inspire their students to pursue STEM.

Our foundation also partners with Sally Ride Science Festival, designed to encourage 5th through 8th grade girls in science, and we assist their teacher development programs. For students, in March we completed our third year as the premier sponsor of the Air Force Association’s CyberPatriot program. This international competition is a national high school cybersecurity defense event designed to excite, educate and motivate the next generation of cyber-defenders. It is one of the nation’s largest and fastest growing high school competitions and last year we hired 28 former participants of the program. A final competition was held in March, where we pledged another $4.5 million to help the competitions continue into 2016.

Another stimulating contest we support in partnership with the Robotics Education & Competition Foundation is the VEX Robotics international robot competition where students at the middle school and high school level, as well as collegiate competitors, build robots to complete a specific task. The Wolf Trap Early Learning Childhood STEM Learning Through the Arts program is a unique endeavor that integrates elements of the performing arts into existing school curriculum to teach science and mathematics to young children. Based at the Wolf Trap Center for the Arts outside Washington, D.C., it served 840 children and 384 educators last year. In 2012, Northrop Grumman partnered with the University of Maryland and the Business Higher Education Forum to launch Advanced Cybersecurity Experience for Students, a landmark honors program designed to educate a new generation of cybersecurity professionals.

Across the country, the number of young students interested in STEM falls short of the projections of the talent our nation will need to propel our economy. If we are not able to increase the number of women and underrepresented minorities in the field. But perhaps the most important effort we support is the countless hours our employees spend volunteering in their local communities around the country. This hands-on, direct engagement means a great deal to these communities.

Bush earned a bachelor’s degree and a master’s degree in electrical engineering from the Massachusetts Institute of Technology. He also completed the University of California, Los Angeles’ Executive Management Program.

Bush serves on the board of directors of Norfolk Southern Corporation, as well as the boards of several nonprofit organizations, including Conservation International and the U.S. Naval Academy Foundation. He is chairman of the Aerospace Industries Association board of governors and chair of the Business-Higher Education Forum.

Under Bush’s leadership, the main focus of Northrop Grumman’s philanthropy effort continues to be expanding and bettering the pipeline of talented mathematics, science, technology and engineering students nationwide.

Wes Bush is chairman, chief executive officer and president of Northrop Grumman Corporation, a leader in global security.

Bush was named chief executive officer and president in January 2010, and elected to the company’s Board of Directors in 2009. He assumed the role of chairman in July 2011.

Bush previously served as the president and chief operating officer of the company. Before that, he served as the corporate vice president and chief financial officer, and, earlier, as the president of the company’s Space Technology sector. Prior to the acquisition of TRW by Northrop Grumman, he had served since 2001 as president and chief executive officer for TRW’s UK-based global Aeronautical Systems. Bush joined TRW in 1987 as a systems engineer, and served in engineering, program management and business development roles in TRW’s Space & Electronics business. Prior to joining TRW, he held engineering positions with both the Aerospace Corporation and Comsat Labs.
Indra Nooyi is Chairman and Chief Executive Officer of PepsiCo. She is the chief architect of Performance with Purpose, PepsiCo’s goal to deliver sustained financial performance by providing a wide range of foods and beverages from treats to healthy eats; finding innovative ways to minimize the company’s impact on the environment; lowering costs; providing a safe and inclusive workplace for PepsiCo employees globally; and respecting, supporting and investing in the local communities in which the company operates.

Indra Nooyi is married and has two daughters.

PepsiCo is a global food and beverage leader with net revenues of more than $65 billion and a product portfolio that includes 22 brands that generate more than $3 billion each in annual retail sales. The company’s main businesses—Quaker, Tropicana, Gatorade, Frito-Lay and Pepsi-Cola—make hundreds of enjoyable foods and beverages that are loved throughout the world. PepsiCo is committed to innovation in its products and supply chain through a strong foundation in research and development all over the world.

PepsiCo continues to deliver Performance with Purpose, the company’s goal to deliver sustained financial performance by providing a wide range of foods and beverages from treats to healthy eats; finding innovative ways to minimize the company’s impact on the environment; lowering costs; providing a safe and inclusive workplace for PepsiCo employees globally; and respecting, supporting and investing in the local communities in which the company operates.

In her role as Chair and CEO of PepsiCo, she is responsible for the company’s corporate functions, including finance, strategy, business process optimization, corporate platforms and information technology, procurement, investor relations and information technology.

Before joining PepsiCo in 1994, Mrs. Nooyi spent time in strategy roles with Asea Brown Boveri, a Zurich-based industrials company, Motorola and The Boston Consulting Group. She holds a B.S. in Physics, Chemistry and Mathematics from Madras Christian College, an M.B.A. from the Indian Institute of Management in Calcutta and a Master of Public and Private Management from Yale University. Mrs. Nooyi is married and has two daughters.

Why do you believe STEM education/workforce development is critical to our nation’s future?

We live in a world where continuous change is the norm, and we need people skilled in science, technology, engineering and math to develop the innovative products and ideas that will allow us to keep up with the rapid pace of change. STEM subjects form the basis for innovation, which is the driver of economic growth and progress. For PepsiCo, we see potential in the talent and development within functions that utilize STEM skills—like research & development (R&D), finance, IT and supply chain—as absolutely essential to our continued success, and that’s a need that will only become more critical in the future. So by supporting STEM education, as we are proud to do through our participation on the STEM Innovation Task Force, we are actually also supporting our own corporate strategic priorities. The goal of the Task Force is to develop programs that accelerate sustainable STEM careers through innovation science and excellence in an economy that is constantly changing.

How do you encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

It’s vital that we increase the numbers of women and minorities in STEM fields, because without their contributions, we will never reach our potential economically and as a society.

The private sector has a particularly important role to play in nurturing young female and minority talent. We need to provide them with more visibility to the STEM-related work we do in the corporate world, and spotlight the women and minorities who are making incredible contributions in the field today. For global companies like PepsiCo, we need to be as diverse as our consumer base to be successful, and that means building a diverse workforce.

Our employees are encouraged to bring their children to work so they can see firsthand what their parents do for a living. By doing so, their children see how their STEM education and scientific excellence can drive amazing breakthrough innovation—which translates into significant top- and bottom-line growth. Bringing that kind of immersive experience to women and minorities is critical to building their future. So by supporting STEM education, as we are proud to do through our participation on the STEM Innovation Task Force, we are actually also supporting our own corporate strategic priorities. The goal of the Task Force is to develop programs that accelerate sustainable STEM careers through innovation science and excellence in an economy that is constantly changing.

Where do you see the biggest area of opportunity in advancing STEM jobs/careers?

There’s a tremendous opportunity to attract young talent toward a career in STEM fields, because the interest is already there. Today’s youth are engaged with high technology in so many forms, but they may not pursue a career because they don’t have a full understanding of the many different kinds of jobs that are out there.

The private sector needs to do a better job of communicating the huge array of jobs that require a STEM education and skills. At PepsiCo, that could range from product development to packaging design to the creation of sustainable agriculture programs—all of these are incredibly stimulating jobs that give people the opportunity to make a real impact on the world. So the supply of great jobs is there in the private sector. We need to do a better job of creating the demand by advertising our jobs and career paths more effectively.

R&D teams are at their most effective when they’re interacting with their colleagues in areas like marketing or consumer insights. When that happens, our scientists, engineers, mathematicians and technologists are able to more fully contribute to the growth of the business.

At PepsiCo, our STEM-oriented functions work closely together with global businesses where we have set up to drive innovation platforms around the world. Together, they lift and shift our best ideas and practices across different markets. This multiplies the impact that our functional teams can have on the global business and enhances their value to the organization.

What is the STEM initiative that your company has supported that you are most proud of?

We have a number of STEM-oriented programs that not only aid the development of our R&D associates but also showcase their incredible talent. We offer a comprehensive online training platform called Global R&D University, where our associates can learn more about areas ranging from nutrition to food safety to product development. This also includes a comprehensive training program on innovation excellence, which helps us deliver a continuous pipeline of meaningful, consumer-centric products.

And we highlight the achievements of the very best of our R&D team with a ceremony called the PepsiCo Academy of Sciences, which honors our brightest scientific minds. At this event, we award our team members who have developed the incredible innovations and supporting science that are transforming our company. It’s a huge point of pride for me and everyone at PepsiCo.

How can we do a better job to strategically coordinate all those engaged with STEM across the company?

The most important thing that corporate leaders can do to advance STEM initiatives is to tie them more closely to the various functions within the business and across different geographies. For example, our
Why do you believe STEM education/workforce development is critical to our nation’s future? America was built on innovation and entrepreneurship. If we want America to continue to lead in the 21st century, there is nothing more important than a continued focus on innovation. By getting today’s top students passionate about careers in science, technology, engineering and mathematics, we create the pipeline of talent necessary to develop the leading technologies that will continue to be the backbone of our economy as well as our security and quality of life.

How do you believe STEM education can improve a nation’s competitiveness? Too few of our top high school students invest their careers into STEM fields today, perhaps because it is increasingly characterized as being too nerdy. So the first challenge is to inspire students toward STEM education, in effect to make it cool again. The second challenge is to deliver a quality educational program. We believe that students form opinions about STEM well before their college years, so high school programs that first capture the imagination of students, and then cultivate their aspirations, will be the source of tomorrow’s innovators and entrepreneurs.

How has your corporation coordinated investments in education with future workforce needs? PTC is very active in two initiatives, FIRST and the Real World Design Challenge (RWDC). FIRST reaches an estimated 300,000 students annually and offers an accessible, innovative, mentor-based STEM programs for K-12. These programs inspire young people to think, design and create something physical using their engineering knowledge and skills. As a Strategic Partner of the FIRST Progression of Programs for K-12, PTC provides free professional-grade engineering software, including PTC Creo® design software, PTC Mathcad® calculation software, and PTC Windchill® collaboration software to all participating FIRST teams, allowing thousands of students along with their teachers and professional mentors to collaborate digitally and virtually on their designs anytime, anywhere.

PTC is a founding member of the RWDC, an annual high school competition run by a public-private partnership with the goal of increasing the Science, Technology, Engineering, and Mathematics (STEM) workforce in the U.S. aerospace industry. The RWDC began in 2008 through a partnership between industry, government, academia, and non-profits. PTC provides program management, software to each participating school, including PTC Creo®, PTC Windchill®, and PTC Mathcad®, as well as introductions and connections to industry partners, team support and technical and administrative support. This year, nearly 5,000 students from across the country participated in the RWDC. Every student participates at no cost to themselves or their schools with partners donating more than a billion dollars of financial and in-kind support to schools since the RWDC’s inception.

What is the STEM initiative that your company has supported are you most proud? We are proud of all our STEM-based initiatives because every one of them helps educate, nurture and build the confidence of students to pursue careers in math, science and engineering.

How can we advance mentorships and apprenticeships in the STEM pipeline? Though everybody is ultimately a winner, the return to the student who becomes inspired toward STEM may be greater in the short term than to the mentor or company who employs the apprentice. A better program that helps companies to establish an effective apprenticeship program, coupled with the matchmaking necessary to connect them with the most needy students—many of whom are in rural or inner city areas—could be helpful to significantly increase the availability of apprentice programs and the exposure of students to these real-world environments.

What do we need in the US to continue to be at the top of global innovation? Innovation and creation of the infrastructure necessary both for security and quality of life represent the backbone of a strong economy and a strong nation, and the inexorable slide toward a service economy may become a precursor of trouble ahead. Organizations, educators and government officials need to work together to create more awareness of the importance of innovation, and then stronger STEM programs so that more students are able to better understand and pursue the wide variety of career opportunities in science, technology, engineering and math fields. When this is successful, we’ll have more students in the types of jobs that will keep the United States at the top of the list of global innovators.
Why do you believe STEM Education/workforce development is critical to our nation’s future?

Helping students develop fundamental STEM-related skills is critical to the health and competitiveness of our economy. The critical thinking, analytical skills and foresight that follow a STEM education not only help students with important life decisions, but they also better prepare students to handle future job demands. Yet more than half of U.S. CEOs point to the lack of availability of key skills as a potential threat to growth in 2013, according to PwC’s 16th annual Global CEO Survey. Today’s students are tomorrow’s leaders—we, as advisors and communities, must come together to provide solutions and help introduce STEM-related courses to students at an early age, and with greater frequency. It’s an economic imperative, and a personal one each of us must own.

How has your corporation coordinated investments in education with future workforce needs?

At PwC, people are our greatest asset. We create an environment that enables them to succeed by providing quality learning and development programs, a flexible work environment, and opportunities to develop leadership outside of work by supporting philanthropic interests both in and out of the office. More than ever before, employees want to make a difference and help solve social issues. Creating opportunities for them to do so only increases their level of engagement with the firm. Through PwC’s Earn Your Future, we’re providing opportunities for our people to bring their skills into the community and demonstrate leadership through diverse educational and life-building experiences that interest and inspire them. With PwC’s support, our people are serving on local youth nonprofit boards, teaching and mentoring youth and delivering pro bono services to nonprofits, all of which provide greater opportunity to engage more of our people in giving time and talent. This shared value—the benefit to the individual, our local communities, as well as the brand of PwC—is the foundation of our investments.

What STEM initiative that your company has supported makes you the most proud?

In June 2012, PwC launched PwC’s Earn Your Future, a $160 million commitment of funding, skills-based volunteering, teacher training opportunities and pro bono services to nonprofits, all of which provide greater opportunity to engage more of our people in giving time and talent. This shared value—the benefit to the individual, our local communities, as well as the brand of PwC—is the foundation of our investments.

What is your advice on using private-public partnerships to tackle our most pressing education challenges in STEM?

One critical component of an effective private-public partnership is to develop a program that leverages the strengths and talents of each organization to create a complementary solution. One way in which we’re doing this is through our partnership with the MIND Research Institute, a nonprofit dedicated to improving math education. The organization has developed software that promotes effective solutions. It’s about looking inward at your company’s greatest assets and seeking ways to support start-ups focused on bringing new ideas to scale.

What advice do you have for leaders in your sector about the intersection of technology and education?

The intersection of technology and education is a key driver of innovation and a necessary component for the U.S. to maintain its status as a global leader. In order to grow our economy, we must continue to find ways to raise the education bar and engage youth in STEM disciplines through innovative mediums. This will require vested interest and thoughtful collaboration to advance these technologies and scale them for widespread access. As an example, the PwC Charitable Foundation, Inc is investing in social entrepreneurship through programs such as Points of Light’s Civic Accelerator, and is actively seeking ways to support start-ups focused on bringing new ideas to scale.
Dr. Paul E. Jacobs
Chairman and Chief Executive Officer
Qualcomm Incorporated

Qualcomm is the leader in wireless technologies and the mobile communications industry. For more than 25 years, Qualcomm’s ideas and inventions have driven the evolution of digital communications, linking people more closely to information, entertainment and each other.

Today Qualcomm is the world’s largest wireless semiconductor company, powering more than 500 of the top smartphones and tablets on the market from all of the leading device manufacturers and operators.

The Company’s technologies not only fuel the next-generation of smartphones and tablets but are also pushing wireless connectivity invention beyond mobile to transform other sectors from healthcare, automotive, government, education to home entertainment.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

At Qualcomm, we understand how important it is to start early in STEM education. We are committed to improving STEM education for students during their primary, secondary, and higher education years and to expanding educational opportunities for underrepresented students. We believe that getting students to study STEM as early as possible and empowering them at a young age is crucial to fostering their future interest and aptitude in STEM subjects. To this point, Qualcomm is a proud member of Change the Equation, which pledges to create widespread literacy in STEM. The initiative aims to improve STEM education for every child, at any age, as well as enable a pool of highly capable STEM teachers.

Additionally, the Company is also a member of the National Center for Women and Information Technology (NCWIT), which supports increasing women’s participation in technology and computing, and helps organizations recruit, retain, and advance women from K-12 and higher education through industry and entrepreneurial careers by providing community evidence, and action.

It is through programs like these that we can deepen appreciation and excitement for STEM programs and careers, and increase enrollment and success. We’ve seen first-hand that a STEM educated workforce breeds opportunity, and as a global leader and developer of advanced wireless technologies, our highly skilled employees are our most important asset. Their ability to calculate, analyze and innovate is the cornerstone of our achievements and their expertise in STEM subject matter is critical to our continued success.

What area of STEM are you most passionate about?

I am an engineer at heart. I believe in the celebration of the engineer’s art of creating an entirely new technology, or improving the foundation of an existing technology. You only have to look at the innovation and impact that has occurred around mobile to understand how important it is for today’s youth to master the fundamental areas of STEM. Not only will they need those skills to participate in the amazing opportunities ahead but they will need them to push for greater technological breakthroughs. Engineers are in high demand in our country—and around the globe—and it’s important to progress STEM education to find our next generation of inventors, leaders and entrepreneurs.

What principles do you apply to your professional and personal life to advance STEM education?

I value innovation and promote the idea that anything is possible. I’ve tried, both professionally and personally, to promote that thinking and ethos in my work and personal life, which I believe ties back to the advancement of STEM education. At Qualcomm, we use advanced technology and approaches to solve fundamental global issues. Whether we’re working to connect the unconnected or introducing wireless education and wireless healthcare to underserved populations, we pride ourselves on our dedication to smashing boundaries. I have always challenged myself and my colleagues to think big about what’s possible and what we can do to enable individualized and personalized experiences, while at the same time promoting collaboration and the sharing of ideas.

What is the STEM initiative that your company has supported are you most proud?

In addition to being a member of Change the Equation, I am most proud of Qualcomm’s initiatives to improve STEM education in our own backyard. As a founding supporter of the Encorps Teachers Program, a nonprofit organization that recruits retiring STEM professionals to teach at California’s under-resourced public high schools, Qualcomm aims to tackle the public education crisis in our home state. Encorps uses the knowledge and experience from seasoned math and science professionals to teach the next generation. Additionally, we established the Qualcomm Institute for Innovation and Educational Success at San Diego State University, supporting Project Lead The Way, which trains middle and high school teachers to implement problem-based, pre-engineering coursework into their classes, as well as Improving Student Achievement in Mathematics (ISAM), which improves students’ mathematics understanding and achievement by enhancing teachers’ content knowledge of mathematics and mathematics teaching effectiveness in grades K-12.

Lastly, this year we were the title sponsor for FIRST Robotics Competition. What is your advice to those involved in promoting STEM education?

We need corporate leaders to make the commitment to advancing STEM education. It is just as important as our need for bright young minds to become the world’s next generation of engineers. Our leaders must invest resources and time to provide mentorship and guidance to students of all ages, and to encourage an entrepreneurial spirit and innovative way of thinking. The technology industry is exciting in that there are pioneers introducing their new ideas, companies, solutions and start-ups on a daily basis. We need these trail-blazing technology mavericks to also empower our students by sharing their experiences and wisdom and to promote STEM education.
William H. (Bill) Swanson
Chairman and Chief Executive Officer
Raytheon Company

Raytheon Company is a technology and innovation leader specializing in defense, security and civil markets throughout the world. With a history of innovation spanning 91 years, Raytheon provides state-of-the-art electronics, mission systems integration and other capabilities in the areas of sensing; and command, control, communications and intelligence systems, as well as a broad range of mission support services. With 2012 sales of $24 billion and 68,000 employees worldwide, Raytheon is headquartered in Waltham, Mass.

William H. (Bill) Swanson is Chairman and CEO of Raytheon Company. Before adding the responsibilities of Chair to his position in January 2004, Swanson was CEO and President of the company. Prior to that, he was President of the company, responsible for Raytheon’s government and defense operations. He joined Raytheon in 1972 and has held a wide range of leadership positions in his 41 years with the company.

Outside of Raytheon, Swanson is a member of the Congressional Medal of Honor Foundation board, a member of the NextEra Energy, Inc. board of directors and vice chairperson of the John F. Kennedy Library Foundation board of directors. He is also a member of the board of governors’ executive committee of the Aerospace Industries Association, the CIA Officers Memorial Foundation board of advisors and the President’s National Security Telecommunications Advisory Committee. He is a fellow of the American Institute of Aeronautics and Astronautics.

Swanson is active in the field of education as a member of the California Polytechnic State University President’s Cabinet, the Cal Poly Foundation board of directors, and the University of Massachusetts President’s Advisory Council. Swanson also serves as the honorary chair of MATHCOUNTS®, is chairman emeritus of the Business-Higher Education Forum and a member of its executive committee.

A native of California, Swanson graduated magna cum laude from California Polytechnic State University with a bachelor’s degree in industrial engineering. He has been awarded an honorary Doctor of Laws degree from Pepperdine University and an honorary Doctor of Science degree from California Polytechnic State University.

Swanson has received the Navy League Fleet Admiral Chester W. Nimitz Award, the NDIA James Forrestal Industry Leadership Award, the John W. Dixon Award from the Association of the United States Army, a Diversity Best Practices CEO Diversity Leadership Award, and a Woodrow Wilson Award for Corporate Citizenship.

Why do you believe STEM Education/workforce development are critical to our nation’s future?

It is critically important for the U.S. to have a strong STEM education pipeline and workforce so our nation can continue to be a leader in innovation. That is because science, technology, engineering and math are the foundation of innovation in this era of global competitiveness.

Without this talent, the U.S. risks mediocrity, which would have unfortunate implications for our economy, industries and national security.

How has your corporation coordinated investments in education with future workforce needs?

At Raytheon, we have organized our STEM education outreach efforts under our flagship MathMovesU® initiative. We launched MathMovesU back in 2005 to engage, inspire and channel their passions to inspire them to create a new, lifelong relationship with math and science, one that opens up a world of career possibilities in STEM. Over the years, it has grown from a middle-school focus to today when we’re involved in every aspect of the STEM pipeline from elementary school up through higher education, as well as supporting teacher training and parental involvement. The MathMovesU program touches the lives of millions of students, teachers and parents.

MathMovesU’s approach is interactive, experiential and exciting—to reflect the scientific and engineering culture of our company. Some notable examples of our MathMovesU programs include a virtual thrills ride called Sum of all Thrills™ at INNOVATIONSTATION® at Epcot® in Walt Disney World®, an interactive game that connects math concepts with football called “In The Numbers” with the New England Patriots and the Kraft family at The Hall at Patriot Place, and a traveling Math Pavilion® that provides students with fun hands-on experiences to demonstrate the math concepts behind engineering in everyday life.

What area of STEM are you most passionate about?

I am most passionate about having an impact on students in the crucial middle school years, especially when it comes to math. Today’s children have so much potential. However, somewhere along the way their interest and aptitude in math begins to wane. Looking at U.S. student performance on international assessments, the average student begins on top of the world in mathematics in elementary school, slips to near the middle of the pack by 8th grade, and sinks to near the bottom by 12th grade. To reverse this trend and secure the U.S. STEM talent pipeline, we need to inspire today’s students to maintain an interest in math and science so they will be excited and prepared to pursue STEM careers. Once they are in the pipeline, we need to sustain that interest so that they stay on track with their science and math coursework.

What principles do you apply to your professional and personal life to advance STEM education?

As a business leader, I receive many invitations to speak to groups, meetings and classes across the country. By and large, the invitations I accept are the ones where I can talk about the importance of STEM, the challenges the U.S. is facing with our STEM pipeline, and ways we can work together to grow the pipeline for the future.

I feel so passionately about this subject, and I try to communicate and spread the word about the challenges and opportunities to advance STEM education every chance I can get. Most recently this has included talks with the Atlantic Legal Foundation, Boys & Girls Club of Boston, and Northeastern University.

What STEM initiative that your company has supported are you most proud of?

I am proud of all of the STEM programs we are involved with at Raytheon, but I have a particular passion for our support of the MATHCOUNTS® National Competition. This is the equivalent of the National Spelling Bee for middle school math competitors, and Raytheon is pleased to be the title sponsor through the year 2018, representing a decade of support. It is also my honor to serve as the MATHCOUNTS honorary chairman, and when I attend the competitions, the enthusiasm of the students is infectious. These students, we call them Mathletes®, are some of our nation’s most talented middle school mathematicians. Witnessing students master mathematics and the excitement on their faces, you really feel good about the future for this next generation and the collective future of our nation.

“Witnessing students master mathematics and the excitement on their faces, you really feel good about the future for this next generation and the collective future of our nation.”
Clayton (Clay) M. Jones is Chairman and Chief Executive Officer of Rockwell Collins. He was appointed CEO at the company’s spin-off in June 2001, and assumed the role of Chairman one year later. Jones previously served as president of Rockwell Collins and was a corporate officer and senior vice president of Rockwell International, positions he was appointed to in December 1998. Prior to that, he held positions as vice president and general manager of Rockwell Collins Air Transport Division and as corporate senior vice president of Government Operations and International in Washington, D.C., where he represented all Rockwell Collins businesses to international and domestic customers.

From 1988 to 1998, Jones was responsible for the space and aircraft systems business areas as vice president of Aerospace Government Affairs and Marketing at Rockwell’s Government Operations office in Washington. In 1982, he was sponsored by Rockwell to serve a fellowship in a White House Executive Exchange program.

He champions the company’s Diversity and Science, Technology, Engineering and Mathematics (STEM) Education strategies. He also is a member of the Board of Directors for the Rockwell Collins Charitable Corporation, which supports not-for-profit organizations—particularly organizations that support STEM education—in the communities where employees live and work. Like many Rockwell Collins employees, Jones regularly participates in activities to increase awareness of STEM-related careers, including our company’s Introduce a Girl to Engineering program and FIRST (For Inspiration and Recognition of Science and Technology) competitions.

A native of Nashville, Tenn., Jones joined Rockwell International in 1979 after serving in the U.S. Air Force. In addition, he holds a bachelor’s degree from The University of Tennessee and a Master of Business Administration degree from the George Washington University.

Over the past century, the U.S. educational system produced incredible numbers of high school and college graduates—more than anywhere else in the world. These highly skilled workers, in turn, boosted innovation and helped drive the economic rise of the United States to become the richest nation on the planet.

Today, we risk losing that position because the rest of the world is doing exactly the same thing we did to become a superpower in the 20th Century: using education—and especially STEM education—to help create new wealth and economic prosperity.

Unfortunately, we’ve all read the steady stream of reports over the years cautioning that, without strong steps to strengthen the science and technology base of our students, our quality of life—and U.S. competitiveness—will be threatened. So, the education system that served us so well in the United States in the last century may not serve us well in the 21st Century. We need to think differently to ensure the workforce of the future is prepared for tomorrow’s challenges—and nowhere do the challenges seem greater than in STEM education.

As I consider a solution, my tendency is to look at the problem using the same perspective we take at Rockwell Collins on a technical issue. For example, if we’re focused on a quality problem, there are two dramatically different ways to look for solutions.

One way is to focus on the immediate problem and treat it with ointment and a Band-Aid as a short-term fix. The risk here is that the issues are very likely to keep recurring.

The other way—and I believe the better approach—is to look at the root cause as a means to prevent the issues from occurring in the future, and ultimately, improve the overall environment for the future.

At Rockwell Collins, we have long believed that the root cause of the issues within STEM education are stereotypes and social barriers that prevent students from gaining science, technology, engineering and math skills early and effectively. That’s why, through our STEM education strategy, we support a variety of hands-on opportunities that break down those stereotypes and social barriers, from elementary school through college, both in the classroom and outside of school.

Our Engineering Experiences initiative was designed to help young people think big, dream big, and consider all the possibilities when it comes to STEM education and STEM careers. The anchor of Engineering Experiences is our partnership with FIRST®, a nonprofit organization that seeks to inspire young people around the globe to be science and technology leaders by engaging them in exciting, mentor-based programs, including FIRST LEGO League, FIRST Tech Challenge and the FIRST Robotics Challenge.

Another program we sponsor as part of Engineering Experiences is Project Lead the Way. This hands-on project-based program allows students to develop critical thinking skills by creating, designing and building things like robots and cars. Through partnerships with middle and high schools, we’re able to provide an experience where students can apply what they learn in math and science classes to solve real-world challenges.

And just like one approach cannot solve the STEM education challenge alone, we recognize one group cannot solve it alone. That’s why partnerships between public and private entities are important. We need businesses and government, along with teachers, parents and non-profit organizations, working together to engage students in STEM studies and introduce students to STEM careers.

This also is true when it comes to measuring results to ensure we’re addressing the right issues—the root cause. An example of this type of partnership is the FIRST Longitudinal Study, where multiple businesses and organizations are working together to provide tangible evidence of FIRST programs’ impact on students’ education and career choices.

In my view, the way to ensure the U.S. educational system is producing highly skilled graduates that can boost innovation and our economy begins in how we define and articulate STEM education challenges. If we start to think differently about problems, if we focus more on the root causes, if we ask the right questions in order to solve the right problems, the workforce of the future will be better equipped to solve tomorrow’s challenges.
Steve Swad
President & Chief Executive Officer
Rosetta Stone

Rosetta Stone Inc. provides cutting-edge interactive technology that is changing the way the world learns languages. The company’s proprietary learning techniques—acclaimed for their power to unlock the natural language-learning ability in everyone—are used by schools, businesses, government organizations, and millions of individuals around the world. Rosetta Stone offers courses in 30 languages, from the most commonly spoken (like English, Spanish and Mandarin) to the less prominent (including Swahili, Swedish and Tagalog). The company was founded in 1992 on the core beliefs that learning to speak a language should be a natural and instinctive process, and that interactive technology can activate the language immersion method powerfully for learners of any age. Rosetta Stone is based in Arlington, VA., and has offices in Harrisonburg, VA, Boulder, CO, Austin, TX, San Francisco, CA, Tokyo, Seoul, London, Dubai and Sao Paulo.

Steve Swad was named president and chief executive officer of Rosetta Stone in 2012 and has served on the company’s Board of Directors since that time. Previously, Steve served as Rosetta Stone’s chief financial officer, directing all accounting, finance, and investor relations activities and overseeing the company’s information technology and global distribution and fulfillment functions.

Prior to joining Rosetta Stone in 2010, Steve was CFO at Converse Technology. Before that, he was CFO for both Fannie Mae and AOL and he held senior financial and operational management positions with Time Warner and its subsidiaries. Steve has also been a partner at KPMG and served as deputy chief accountant at the US Securities and Exchange Commission.

Steve’s career highlights include transforming business models, launching new businesses, identifying, acquiring and investing in strategic assets, and overseeing and expanding international operations. Steve holds a BBA from the University of Michigan. He speaks English and is learning Spanish.

Why do you believe STEM Education/workforce development is critical to our nation’s future?

According to the National Math and Science Initiative, by 2018 more than 8.6 million STEM-related jobs will be available and approximately 3 million of those jobs will be unfilled. As a nation it is imperative that we make STEM education a top priority. American students lag behind Asian and European students in math and science. Based on the 2010 ACT College and Career Readiness report, of the tested 2010 graduates only 43% of students are considered college-ready in math and a dismal 29% are college-ready in science. In order to compete successfully in the global market, the United States needs a workforce that is skilled in the STEM fields and capable of collaborating across international borders.

Beyond Standards, what are the first steps we should take to curb the STEM education crisis?

Based on the current need of innovation, it is clear that most jobs of the future will require significant STEM preparation. As a nation we need to sharpen our focus on STEM education to ensure we educate our workforce to compete with top global talent. Our challenge is to increase funding and the opportunities available to these students. We have to engage students in STEM fields of study early to harness interest and passion for the field.

As we cultivate STEM education, we must bear in mind those with whom the future STEM workforce will compete. In a recent Forbes survey, three-quarters of respondents agreed that it was easier for foreign nationals to work in the U.S. than for U.S. nationals to work overseas because they were more likely to be multilingual. There is a high probability that many of our STEM students will experience working on international projects; they will be faced with the challenges of working in cross-cultural environments. We need to prepare them for this reality by providing opportunities to learn languages. Fostering a positive understanding and attitude to this factors in crucial to their success.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

According to the National Center for Women & Information Technology, women account for only 18% of all computing and information sciences degrees. Further, a recent report from US News finds that minorities earn only 12% of all undergraduate degrees in engineering. There is a need to address this disparity and expand education and career opportunities to these underrepresented groups.

Diversity drives innovation and creativity. If we want to prosper in a global market we need to do more to empower women and minorities and recruit them into STEM fields. In general, we understand there is a need to recruit minorities into this field, but there are many obstacles that prevail. As an example, consider the barriers that may inhibit Latinos, the fastest growing demographic in this country: limited language skills, and significant cultural and socioeconomic stigmas.

We must strengthen national policy and legislation and arm educators with the resources to expand access to programs that support STEM education. Increasing efforts to provide comprehensive scholarships in STEM education for women and minorities would certainly help.

How has your corporation coordinated investments in education with future workforce needs?

As an education company, Rosetta Stone has been expanding its capabilities to address evolving workforce needs. Through our flexible technology platform, both educators and business leaders are now able to arm students with the STEM content they need and simultaneously tap into a tool that fosters skills needed to be globally competitive. Imagine many schools that have the capability to provide students STEM studies in a dual-language program. This creates a powerful combination of STEM skills and global competency that could prepare students for future STEM opportunities anywhere in the world.

What do we need in the US to continue to be at the top of global innovation?

We have a serious shortage in STEM expertise and this represents a potential problem to our nation and our economy. To address this challenge we need to think locally as well as globally. We need to come together within our communities to focus our efforts into programs and partnerships that support STEM initiatives. At the local level, business leaders and educators should work together to build STEM capacity for K-20. We need to recognize that as a nation we cannot work in a vacuum and that collaboration across nations is part of the new age of global innovation.

As the global economy becomes more tightly integrated, we will need to develop technology incubators to engage with and collaborate with other top talent across the world. Our current policy is built on the assumption that we are better off keeping our R&D efforts inside the U.S. We need to shift to a more globalized approach. This will require our workforce to be globally minded and be able to collaborate with innovators across the world to connect and share global ideas.
How do you believe STEM education can improve a nation’s competitiveness?
Technology is evolving faster than ever before. To remain competitive in the global marketplace, U.S.-based companies must continually advance the next great innovation. Doing so requires a workforce with top-notch technical skills and the ability to think critically and creatively. These are the skills that a world class STEM education provides.

Unfortunately, when it comes to STEM preparation, there are gaps and inadequacies in our education system. If schools and businesses commit to finding ways to partner in improving STEM education, we will prepare today’s students to be tomorrow’s innovators. A new generation of innovators will be needed to ensure that the U.S. remains competitive in the global marketplace.

What is your advice to those involved in promoting STEM education?
First, I encourage those working to promote STEM education to develop meaningful, long-standing partnerships with businesses in order to understand what types of STEM skill sets are needed in the workplace. For example, RTI has an interest in material science (metallurgy), accounting/finance, engineering and IT professionals.

Once you have a solid understanding of the practical applications of STEM education, seek creative ways to make STEM fields attractive to students. And don’t neglect the importance of STEM teachers. Push for policies that require rigorous math and science curriculums in all American schools, colleges and universities.

Regular training to keep teachers’ knowledge base sharp. Finally, be relentless in your pursuit. We will not overcome the inadequacies in STEM education over night. However, I believe that your investment of time, talent and resources in the pursuit of STEM excellence will result in a generation of students prepared to meet the technological needs of the future.

What do we need in the US to continue to be at the top of global innovation?
The U.S. needs to produce more technical school and college STEM majors. Top-notch STEM professionals are critical for American businesses to stay at the forefront of global innovation, but our technical schools, colleges and universities are not graduating enough of these professionals to meet the demand.

We’re filling some of that gap by importing STEM talent from other countries. We must also seek ways to make it attractive for U.S. students, especially women and minorities who are underrepresented in the field, to choose STEM careers.

Additionally, we must develop and support rigorous math and science curriculums in all American elementary and secondary schools so that there is a wide and deep pool of graduating seniors that are genuinely prepared for technical school and college-level STEM studies.

How is your company connecting diversity initiatives with STEM initiatives? Is this a part of your comprehensive strategy?
As a business leader and woman in the STEM field, I am passionate about finding ways to increase the number of women and minorities in the field. As a business leader, I’m also passionate about increasing the number of candidates with strong STEM backgrounds because RTI’s reputation as a leader in “Advancing Titanium” depends upon it.

We believe that committing early to student education in the STEM fields will build robust pipelines of future STEM employees. For example, we annually sponsor a high school team to compete in the Aerospace Industries Association’s Team America Rocketry Challenge. RTI managers volunteer at local schools and through other STEM-sponsored organizations, and I have personally taken schoolchildren on plant tours.

Diversity initiatives are a core principle of RTI’s strategic plan, and we use that commitment to support and encourage diversity in STEM fields. When we are identifying and selecting viable STEM candidates for anticipated openings, our goal is to identify at least one minority and one female for every open leadership position. Women and minorities are vastly under-represented in STEM fields so this is a challenge—but one that we embrace. ■
Ed Casey
Chairman and Chief Executive Officer
Serco Inc.

Serco is a leading provider of professional, technology, and management services focused on the federal government. We advise, design, integrate and deliver solutions that transform how clients achieve their missions. Our customer-first approach, portfolio of services, and global experience enable us to respond with solutions that achieve outcomes with value.

Our IT & Professional Services practice designs, develops and deploys solutions that enhance the quality and accuracy of information and provide seamless information-sharing. Our Managed Services practice delivers mission-critical operations and personnel that increase efficiency, productivity and quality of service. Our range of capabilities assist clients with their need to respond to new mandates and expand the scope of their missions.

Serco Inc. is a wholly-owned subsidiary of Serco Group plc, an international business that helps transform government and public services around the world.

Ed Casey is Chairman and Chief Executive Officer of Serco Inc. Since joining Serco in 2006, the Company has expanded its presence to provide services to every branch of the U.S. military, numerous federal civilian agencies, the intelligence community, the Government of Canada, and state and local governments. Under Casey’s leadership, Serco has grown to approximately $1.2 billion with approximately 8,000 employees.

Casey has more than 30 years of experience as a growth-oriented business executive, financier, and entrepreneur. Beginning his career in investment banking, he specialized in merger and acquisition transactions at The Blackstone Group and was a managing director at UBS Warburg LLC. He was founder and managing partner of a private investment firm specializing in energy projects and providing growth capital to small businesses. He also was a managing partner of the Fremont Group, where he was responsible for private equity investments.

Casey was a leader in shaping the deregulated energy industry, where he launched one of the utility industry’s first fully competitive power project development and marketing businesses and secured the first federal approval of a utility-affiliated marketing operation. He served as group president of LG&E Energy and as president and chief operating officer of Tenneco Energy, where he was responsible for one of the nation’s largest natural gas pipeline systems. Casey also launched NP Energy, which in its second year grew to be the 14th largest electricity marketer in the U.S.

Casey earned a bachelor’s degree in economics from Harvard College and a Master of Business Administration degree from the University of Virginia’s Darden School of Business. He serves on the Executive Committee of Serco Group plc, and also serves on the Executive Committee of the Board of Directors of the Professional Services Council and the Board of Directors of the Northern Virginia Technology Council.

Why do you believe STEM Education/workforce development are critical to our nation’s future?

Over the past 10 years, growth in STEM jobs has significantly outpaced the growth of non-STEM jobs, and it is clear that this trend is likely to continue. Projections by the U.S. Department of Labor show that the fastest growing occupations require STEM preparation, while the U.S. Congress Joint Economic Committee recently reported that the United States is falling behind in international comparisons when it comes to providing an adequate supply of STEM workers. There is a growing disconnect between the skills our graduates have and the skills required to fill the jobs of the future. STEM education is critical in closing this gap, and developing a workforce that is skilled in the roles required for growing our nation’s economy.

How do you believe STEM education can improve a nation’s competitiveness?

STEM education creates critical thinkers and enables the next generation of innovators; both are skills that can be carried forward throughout a career. Critical thinking skills provide the ability to analyze, comprehend, and then effectively communicate what is interpreted from the data. Innovation leads to new products and processes that support the growth of our economy. The continued development of STEM skill sets in tomorrow’s workforce will retain our nation’s position as a thought leader, and enable our ideas and innovations to be embraced around the world.

Beyond Standards, what are the first steps we should take to curb the STEM education crisis?

The first step in a much larger process is exposing students to STEM fields early in their education. Many students now are removed from an understanding of how things work. They are immersed in social media, electronic games and the internet, yet lack an understanding of the math, science and engineer-

“Corporations across the country have the greatest resource to promote and enhance the future of STEM education—our people.”
Eric Spiegel is the President and CEO of Siemens Corporation and is responsible for growing the U.S. business in the company’s largest market. With $22 billion in sales, 65,000 employees in the U.S., Siemens provides solutions for more affordable and efficient healthcare, the growing demands of cities and the nation’s infrastructure needs, cleaner sources of energy production, and industrial productivity. Siemens has over 130 manufacturing sites across the U.S. and is represented in all 50 states.

Mr. Spiegel, 54, joined Siemens in January 2010. Prior to joining Siemens, Mr. Spiegel was with Booz Allen Hamilton from 1986-2008 and Booz & Company from 2008-2010. A graduate of Harvard University and the Tuck School of Business at Dartmouth College, Mr. Spiegel is the Chairman of Ford’s Theatre Society Board in Washington, D.C. and a member of The Board of Overseers at Dartmouth’s Tuck School of Business. He is also the Vice Chair of the Education and Workforce Committee at the Business Roundtable and is a member of the board of the U.S. Chamber of Commerce. An expert on the global energy industry, Mr. Spiegel co-authored the 2009 book Energy Shift: Game-changing Options for Fueling the Futures which has been translated into Arabic, Spanish, Korean and Japanese.

Why do you believe STEM education/workforce development is critical to our nation’s future?

We’re at a crossroads in the U.S. concerning how we educate and train our youth. Today’s education to employment journey is fraught with obstacles. From the rising cost of enrolling in college education to a lack of curricula that prioritize on-the-job, hands-on learning, students struggle to gain the skills needed to be part of the workforce. Half of youth are not sure that their college education has improved their chances of finding a job and almost 40 percent of employers say a lack of skills is the main reason for entry-level vacancies. We know that STEM jobs are growing 3 times faster than non-STEM jobs, yet on a recent OECD list evaluating 29 countries on how much they teach work-based skills in high school, the U.S. ranks dead last. We are not arming our students with the right skills for the jobs of today and tomorrow. This creates a skills gap, which, if we don’t address it, will only widen as time goes on.

How has your corporation coordinated investments in education with future workforce needs?

In 2011, in Charlotte, North Carolina, we opened the world’s most advanced gas turbine manufacturing plant. As we looked to build our workforce, we had a hard time finding people with the necessary skills for our open positions. In order to begin to create a pipeline of workers for the future, we began an apprenticeship program for graduating high school students. This program is based on the traditional German system that has been part of our company heritage since its inception.

We are part of a local consortium with other companies in the area and we have established a partnership with Central Piedmont Community College (CPCC) for a 3-year program that immerses a student in a Machining Technician curriculum. This is the second year of the apprenticeship program in Charlotte and 12 students are enrolled. Students attend classes at CPCC and are paid to work for Siemens during their breaks to get hands-on training. Siemens invests $165,000 for the education and training of each apprentice and upon successful completion of the program they will be offered a job at Siemens. We are very proud of the Siemens Competition, a national premier science research competition for high school students. Winners achieve national recognition for their research projects and earn scholarships ranging from $10,000 to the coveted $100,000 grand prize. The competitors are a remarkable group of young men and women and Siemens is proud to recognize their talent so early in their promising careers.

What is your advice on using private-public partnerships to tackle our most pressing education challenges in STEM?

Public-private partnerships are an essential component to creating a successful education-to-employment system because they allow for the marriage of supply and demand. Businesses can communicate their immediate and anticipated needs. Educational institutions and instructors can respond to the needs of the marketplace by structuring their programs and curricula around the local industries. Students are then educated and trained in a skill set that will enable them to compete for available jobs in their community. Public-private partnerships are a win-win-win.
Harry H. Stine
President and Founder
Stine Seed Company

Stine Seed Farm, Inc., headquartered near Adel, Iowa, is focused on developing the world’s best-performing corn and soybean seed, and marketing that seed through its retail division, Stine Seed Company. Stine operates the industry’s largest corn and soybean breeding and development programs, advancing and testing nearly 1 million unique soybean varieties and more than 100,000 preliminary corn hybrids annually. For nearly four decades, Stine’s soybean research program has been regarded as the soybean genetics supplier of choice to the seed industry, and Stine’s portfolio of seed, trait and technology patents has earned it Top Ten placement on the Patent Board’s rankings for the Food, Beverage and Tobacco industry.

Harry H. Stine is a farmer and seedsman. In four decades Stine’s company has become the most renowned private soybean breeding program in the country, developing the genetics that are used on a significant portion of all the soybean acres planted in the U.S.

Stine was raised in rural Dallas County, Iowa. He went on to receive a bachelor’s degree from McPherson College in McPherson, Kansas. After college, Stine returned home to help his father Bill who, in addition to farming and raising hogs, had established Stine Seed Farm to clean public soybean varieties.

In the late 1960s Stine joined with four other seedsmen in forming Improved Variety Research (IVR), one of the first private soybean research and development companies in the nation. In 1973 IVR was dissolved, and Stine and head plant breeder Bill Eby founded Midwest Oilseeds, which today is the industry’s leading soybean genetics developer.

In 1979 Stine began selling soybean seed under his own label, Stine Soybean Seeds. In 1992, Stine began selling corn and soft red winter wheat under the Stine label.

Through it all, Stine has remained a farmer first, and seedsman and businessman second. His love for the land has kept Stine involved in nearly all aspects, even as his companies have experienced tremendous growth.

His efforts in the field of agriculture have not gone unnoticed. In 1989 Stine was named Agrimarketer of the Year by the Iowa chapter of the National Agri-Marketing Association (NAMA), as well as the Ernst & Young Iowa/Nebraska Entrepreneur of the Year. In 2000 the Des Moines Register named him as one of the 50 most influential people in Iowa. In 2002 Stine received an honorary doctorate degree from McPherson College, and in 2003 Stine was inducted into the Iowa Business Hall of Fame. Then, in 2007 the Iowa Biotechnology Association recognized Stine with its Entrepreneurial Achievement Award, while the Iowa Farm Bureau Federation honored him with its Distinguished Service to Agriculture Award.

Why do you believe STEM Education/workforce development are crucial to our nation’s future?

STEM education/workforce development is critical to our nation’s future because it is what drives advancement. Where there is a strong focus on STEM, there is a focus on innovation. Every issue faced by modern society—from hunger, to medicine, to energy and conservation—will require the application of STEM principles to be effectively managed.

How do you believe STEM education can improve a nation’s competitiveness?

A strong country requires bright minds, minds that can work through the complex nature of the modern world and seek better solutions. Countries with an emphasis on STEM education are better able to seek these solutions, to harness the power of technology for the greater good, which ultimately makes them more competitive in today’s global environment.

Beyond Standards, what are the first steps we should take to curb the STEM education crisis?

First and foremost, we need to make STEM education accessible to all students, at all levels. A student that is eager to learn should not be denied the opportunity to study STEM subjects due to budgetary constraints. Secondly, we need to make STEM education engaging, which means gearing curricula to be relatable to the students and the world around them. Perhaps most importantly, we need to train and recruit quality teachers who can ignite the spark for learning and keep students motivated to always remain curious.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

We know that the thirst for knowledge begins at an early age so, in order to maintain emphasis on STEM subjects, we must start with young students. From there we need to gear curriculum to focus on improving our students’ critical thinking, which is the foundation for STEM education. Finally, we need to encourage students from all walks of life to join the conversation, as the best ideas come when you have a wide range of inputs.

What traits do corporate leaders need to effectively support and advance STEM education today?

As a farmer, and due to my involvement in plant breeding, I would say that the area of STEM that I am most passionate about is science.

“A strong country requires bright minds, minds that can work through the complex nature of the modern world and seek better solutions.”
Steve Bennett
Chief Executive Officer
Symantec

Symantec protects the world’s information, and is the global leader in security, backup and availability solutions. Our innovative products and services protect people and information in any environment—from the smallest mobile device, to the enterprise data center, to cloud-based systems. Our industry-leading expertise in protecting data, identities and interactions gives our customers confidence in a connected world. More information is available at www.symantec.com or by connecting with Symantec at: go.symantec.com/socialmedia.

Steve Bennett was named Symantec’s chief executive officer in July 2012. Prior to that, Bennett joined Symantec’s board of directors in February 2010, and was chairman from 2011 to 2013. Bennett previously led Intuit serving as president and chief executive officer from 2000 to 2007. At Intuit, Bennett combined the company’s historic innovative and customer-driven expertise with strategic and operational rigor. Intuit revenue grew to $2.7 billion in fiscal 2007 from less than $1 billion in fiscal 2000. Under Bennett’s leadership Intuit grew its existing businesses while simultaneously expanding into new markets, such as online banking and healthcare.

Bennett joined Intuit after a 23-year career at General Electric, where he managed complex and diverse organizations from consumer appliances to financial services. During his career at GE, he held a variety of key management roles in numerous areas of the business, including GE Capital e-Business, GE Capital Vendor Financial Services, GE Electrical Distribution and Control, GE Appliance, GE Medical Systems and GE Supply.

He currently serves on boards at American Airlines and parent company AMR Corporation. Bennett graduated from the University of Wisconsin with a bachelor’s degree in finance and real estate.

Beyond Standards, what are the first steps we should take to curb the STEM education crisis?

We need to create partnerships focused not only on making STEM accessible, but also on helping STEM subjects become something kids are genuinely passionate about. STEM professionals are tackling issues students can get excited about; we just need to show students the opportunities available to them. At Symantec, we have engineers that work to secure the world’s ever-burgeoning digital information. Other companies are exploring space or inventing the next best technology, all exciting things for kids to know more about.

Employees at companies like ours are role models to younger generations. Mentors can empower students to know that their dreams of working in STEM fields can become a reality.

Making STEM a priority is necessary to guarantee proper funding for STEM initiatives, ensuring students gain access to the support they need to be successful. We need everyone to play their part—from businesses, to NGOs, to educators, to government. Together we can turn the tide.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

Granting access to quality programs is one of the most important things we can do to encourage STEM studies. Furthermore, providing role models is essential to helping students become engaged with STEM on a personal level. Programs such as Teach for America’s Math and Science Education Initiative and the Boys and Girls Clubs of America’s (BSCCA) Club Tech are significant in helping underserved students engage with STEM subjects.

Symantec is partnering with BSCCA on a new initiative to increase STEM programming to underserved student populations. Symantec will support Clubs nationwide, and fund mini-grants to help Clubs expand STEM programs. These programs will empower Clubs to increase engagement with youth who have the potential to become future leaders in STEM.

How has your corporation coordinated investments in education with future workforce needs?

Strong partnerships are crucial to helping us reach our workforce goals and have maximum impact.

We join with organizations such as the Silicon Valley Education Foundation to provide summer math and science programs and advocate for academic excellence in STEM standards, and Science Buddies to promote hands-on science exploration for K-12 students. These partnerships contribute to our goal of making STEM education more accessible, positioning us to better meet future workforce demands.

What is the key to smart STEM investments?

The key to smart STEM investments is to seek partnerships with programs that have demonstrated measurable results and create sustainable programs that inspire populations most in need to pursue STEM careers. We need to help students connect STEM education to the innovative products and the discoveries that have enlightened our society.

Teach for America is a great partner focused on moving the needle in STEM education. By 2015, they aspire to have 5,000 STEM teachers reaching 350,000 students nationwide. Their corps members are working in underserved communities, reaching the students we want in STEM professions.

How is your company connecting diversity initiatives with STEM initiatives? Is this a part of your comprehensive strategy?

Our women’s initiative internally is focused on increasing the number of women in technology in our company. This is an integral part of our strategy because it will make us a more competitive and innovative company, providing diversity of thought and perspective.

Symantec works to drive the broad systemic change needed to attract women to STEM careers through partnerships with the Anita Borg Institute (ABI) and the National Center for Women & Information Technology. In addition to our philanthropic support of ABI, we are also proud that two Symantec leaders serve with the organization—one on the Board of Trustees and the other as a member of the Advisory Board.

Symantec
N. Chandrasekaran
Chief Executive Officer & Managing Director
Tata Consultancy Services

Tata Consultancy Services is an IT services, consulting and business solutions organization that delivers real results to global business, ensuring a level of certainty no other firm can match. TCS offers a consulting-led, integrated portfolio of IT, BPO, infrastructure, engineering and assurance services. This is delivered through its unique Global Network Delivery Model®, recognized as the benchmark of excellence in software development. A part of the Tata group, India’s largest industrial conglomerate, TCS has over 276,000 of the world’s best-trained consultants in 44 countries. The company generated consolidated revenues of US $11.6 billion for year ended March 31, 2013 and is listed on the National Stock Exchange and Bombay Stock Exchange in India. For more information, visit us at www.tcs.com.

Natarajan Chandrasekaran (“Chandra”) is the Chief Executive Officer and Managing Director of Tata Consultancy Services (TCS), a leading global IT solution and consulting firm, and a member of its Board of Directors. He was elevated to the role of Chief Executive in October 2009 after serving as the Chief Operating Officer since 2007.

With revenues of $ 11.6 billion in 2012-13, TCS is among the fastest growing IT services companies globally with a compounded annual growth rate of 26 percent over the last three years. The market capitalization of the company crossed USD 50 billion during 2012-13. With over 276,000 consultants, TCS is one of the world’s largest private sector employers with the highest retention rate in a globally competitive industry.

A tireless traveler who is always willing to meet customers, Chandra personifies TCS’s commitment to its stakeholders. His reputation for high service quality as well as its tradition of innovation, a technopreneur known for his ability to make big bets on new technology, Chandra has been driving several innovative initiatives at TCS, some of which have since scaled into sizeable new businesses.

Under his guidance, the company has refined its corporate sustainability program to focus on education, environment and wellness. Through his active support of major marathons in Boston, Berlin, New York, Chicago, Amsterdam, Mumbai and Bangalore, he has helped spread a message of health awareness across the firm’s employees globally as well as in communities in which it operates.

Chandra has spent his entire career in TCS, joining the company in 1987 after completing a Masters in Computer Applications from Regional Engineering College, Trichy, India. The SRM University has conferred the Degree of Doctor of Literature (2010) on Chandra for his Pioneering and Outstanding contributions to the industry.

How do you believe STEM education can improve a nation’s competitiveness?

There is no doubt that a nation that is technologically savvy will inevitably have a competitive edge. As we become more “digital” as a society, not only does STEM education lead to technology-led innovations, but also increased competitiveness and productivity of a country. Future job growth will be in STEM disciplines, and a nation aspiring to be a global leader can use STEM education as a perfect platform for economic growth and prosperity.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

Through an inclusive multi-prong strategy, we can encourage all students to continue STEM studies by:

- Showcasing future opportunities in STEM careers for students, parents, and teachers
- Generating genuine excitement in STEM subjects inside and outside of the classroom for today’s generation through STEM job matrices, STEM career profiles, and by through STEM role models.
- Providing mentorship to encourage women and minorities, giving a first-hand look into the makings of a successful STEM career, and creating pathways for knowledge sharing and advice.

How has your corporation coordinated investments in education with future workforce needs?

TCS has a highly evolved ecosystem of workforce planning, and we have made significant investments in identifying, engaging, and preparing our future workforce. Through our Academic Interface and Campus Relations Programs, we partner with top universities around the world to collaboratively source STEM talent. Additionally, our STEM outreach program impact the creation and sustainability of a STEM talent pipeline for the present as well as the future.

What area of STEM are you most passionate about?

With an educational background in Computer Science and a 25-year career in IT, I am most passionate about mathematics and algorithms. As a discipline, math equips you to think analytically in any given situation which is highly relevant in today’s world as we connect discrete sources of structured and un-structured information to create innovative and compelling services.

What principles do you apply to your professional and personal life to advance STEM education?

One of the guiding principles that I have adopted both personally and professionally to advance STEM education is “Realize One’s Potential”. Creating an open culture to continuously learn, encourage experimentation and foster collaboration is essential for advancing STEM education.

What STEM initiative that your company has supported are you most proud of?

We are proud of our golf Student Technology Program, a multi-tiered outreach program engaging students, parents, universities, and local government, with the goal of increasing student excitement and participation in Technology related careers. Since its inception in 2009, golf has evolved from a two-school camp to a multi-city, year-long program and has influenced over 2,000 students across 40 school districts to pursue technology related careers. The key ingredients of golf are:

- Impact based volunteerism: TCsers assist high school teachers throughout the school year by supplementing their lesson plans on a variety of programming topics. Students receive hands-on demonstrations on programming mobile applications and more.
- Job-Skills Gap Assessment: We connect with universities to understand the gaps between university curriculum and workplace needs. These insights influence technologies the students are exposed to during golf workshops.
- Summer Camps: We also host golf summer camps to demonstrate real-life STEM role models and provide hands-on exposure to new technologies through a competition.

We are also proud to be a part of the goIT Student Technology Program, a multi-tiered outreach program engaging students, parents, universities, and local government, with the goal of increasing student excitement and participation in Technology related careers. Since its inception in 2009, golf has evolved from a two-school camp to a multi-city, year-long program and has influenced over 2,000 students across 40 school districts to pursue technology related careers. The key ingredients of golf are:

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We are also proud to be a part of the STEMconnector® STEM Innovation Task Force, and join the collaborative efforts of national leaders to help shape the future of STEM talent, job creation and careers in US.

What do we need in the US to continue to be at the top of global innovation?

The US has long been looked upon as the leader in global innovation. In order to continue to lead, it is critically important to focus on four key areas: building capability and capacity, enhancing quality, and improving employability in STEM education. To build capability, we must ensure our current and future workforce have the proper skills, education, and training to pursue a STEM career. To grow capacity, we must inspire students and youth to embrace STEM disciplines, and eventually pursue a STEM career. To enhance quality, we must ensure that our educators are adequately equipped and that our standards are comparable to or more rigorous than the rest of the world. To improve employability, we need corporations to invest time in vocational training to prepare tomorrow’s workforce for a future in STEM careers. All of these outcomes will help ensure that US continues to be at the top of global innovation.
Richard (Rich) K. Templeton
Chairman, President and Chief Executive Officer
Texas Instruments

Texas Instruments Incorporated (TI) is a global semiconductor design and manufacturing company that develops analog ICs and embedded processors. For more than 85 years, TI has used increasingly complex technology to change the world. Today, TI’s semiconductor innovations help more than 100,000 customers unlock the possibilities for a smarter, safer, greener, healthier and more enjoyable world. By employing the world’s brightest minds, TI creates innovations that shape the future of technology and helps its customers transform the future. Today, TI is committed to creating an ecosystem that drives innovation through its support of K-12 and post-secondary education. Over the past five years, it has contributed more than $150 million to education. Higher education has received more than 80 percent of this investment. In addition, employee volunteer hours, equipment donations and in-kind contributions significantly extend the impact of this commitment in 2012, 21 percent of these funds supported K-12 initiatives for students and teachers.

Why do you believe STEM Education/workforce development is critical to our nation’s future?
Innovation is the key to our company’s and nation’s future, and to innovate, TI and other American companies must be able to hire highly skilled, STEM-capable engineers and technicians. But the demand for STEM workers is great, with the U.S. STEM workforce is expected to grow through 2018, to an estimated 8.65 million workers. To ensure the quality of our future workforce and stay globally competitive, we must support advancements in STEM education.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?
We engage directly with students as tutors and mentors to help them prepare for success beyond high school. We support teachers by providing training, and we provide awareness for parents of under-represented minorities and girls. We want to show them that providing a strong foundation in STEM will help students succeed in a global workforce. Among the ways we influence the study of STEM subjects:

- **Robotics:** We support the FIRST, BEST and VEX robotics competitions where our employees serve as coaches and organizers where sports-like teams of students build robots and compete in fun and educational games. By providing hands-on experiences like robotics, we see students get interested in and begin to consider STEM careers.
- **Teacher Development:** TI recognizes that to increase the number of math and science-capable students equipped to enter into and graduate from STEM-based disciplines, we must first invest in teachers. The TI Foundation has funded programs such as Teach for America and UTeach to increase the number of math and science teachers in Dallas’ traditional and charter public schools.

In 2013, we will launch a skills-based volunteer program. We are encouraging our team of engineers, analysts, and finance and communications experts to take their talents into the community, providing support for non-profits and classrooms across our footprint.

How can we do a better job to strategically coordinate all those engaged in STEM across the company? (Across different departments)
At TI, we have established an Education Stakeholder Team that meets regularly to bring together key employees whose jobs involve K-12 education and workforce development to discuss and coordinate such initiatives. The cross-functional, cross-departmental engagement helps align various initiatives with the company’s overall strategy and focus investment and involvement on effective programs. Outcomes and data from this team are shared broadly with our more than 33,200 employees via our intranet system.

What is the key to smart STEM investments?
We must move from being great philanthropists to being strategic investors who are looking for return on investment—with the ROI in this case being student achievement. We identify outcomes-based organizations focused on root causes. We look for programs that have direct link to student achievement and can prove it. The key is recognizing that solutions take more than money. It takes investment and involvement. We align volunteerism with giving, inspiring our employees to get directly involved in education as contributors, volunteers, mentors, tutors and advocates. It’s important that we help our education stakeholders tell their story as well.

We must stick with it; we have supported education since TI’s founding more than 80 years ago, and it’s as important today as it was then.

Finally, we must collaborate with others who share our goal of quality STEM education for every child. We believe that every child can and should have the educational foundation to succeed regardless of race, geography, native language, gender or income.

What is your advice on using private-public partnerships to tackle our most pressing education challenges in STEM?
Business cannot act alone. A collaborative effort is required for systemic change. It’s the responsibility of business to join other key education stakeholders—school districts, higher education, non-profits, city governments, and others—to work together with a shared agenda for collective impact. Together, we can solve STEM education challenges and achieve large-scale systemic change through collective impact.

Richard (Rich) K. Templeton is chairman, president and chief executive officer of Texas Instruments (TI). He became chairman of the board in April 2008, and president and chief executive officer in May 2004. He has served on the company’s board of directors since July 2003. Under his leadership, TI has emerged stronger, with better technological and product positions in its core businesses.

In addition to his TI duties, Templeton has focused much of his external energies on public issues and initiatives that advance the high-tech industry, technological innovation and education, particularly STEM (science, technology, engineering, and math) education.

With Templeton’s direct involvement, TI has extended its reputation as a strong supporter of K-12 education on both the philanthropic and business sides. During the 2012-2013 United Way of Metropolitan Dallas campaign, Templeton served as the most important day as any time in our history.

CEO service project with almost 40 C-level executives participating in a “STEM in the Schoolyard” project with fifth graders at a Dallas elementary school. The event successfully increased awareness by engaging the area’s top corporate stakeholders through direct interaction with students. Through this and many other initiatives, TI and its employees are making an impact in TI’s “own backyard”, strengthening STEM teaching and student achievement.

TI’s top philanthropic priority is the positive transformation of the K-12 public education system within its communities where employees live and work. By partnering with key education stakeholders who are focused on student achievement, TI is helping develop and support outcomes-based STEM education programs. In the U.S., the company’s STEM focus is especially directed toward increasing skills among under-resourced communities and under-represented minority students and girls.

In 2012, Templeton received the Robert N. Noyce Award from the Semiconductor Industry Association. The award, which is selectively presented to industry leaders, cited his service as a “vigorously advocate for STEM education and longtime champion of research and innovation.”

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Marc Casper
President and Chief Executive Officer
Thermo Fisher Scientific

Thermo Fisher Scientific Inc. is the world leader in serving science. Our mission is to enable our customers to make the world healthier, cleaner and safer. With revenues of $13 billion, we have 39,000 employees and serve customers within pharmaceutical and biotech companies, hospitals and clinical diagnostic labs, universities, research institutions and government agencies, as well as in environmental and process control industries. We create value for our key stakeholders through three premier brands, Thermo Scientific, Fisher Scientific and Unity Lab Services, which offer a unique combination of innovative technologies, convenient purchasing options and a single solution for laboratory operations management.

Thermo Fisher Scientific has both an interest in, and a responsibility for, inspiring tomorrow’s scientists and engineers. The Thermo Fisher Foundation for Science was created to give back to our global community by supporting science students and broadening interest in STEM.

Marc N. Casper is president and chief executive officer of Thermo Fisher Scientific. Casper joined Thermo Electron in December 2001 as president of its life and laboratory sciences segment. He was named senior vice president of the company in December 2003, and in March 2005 was given responsibility for all operating divisions. In November 2006, when Thermo Fisher Scientific was formed through the merger of Thermo Electron and Fisher Scientific, Casper was named executive vice president of the company and president of the Analytical Technologies Group. In May 2008, he became chief operating officer of Thermo Fisher Scientific, and in October 2009, he was named president and CEO. Under his leadership, the company’s foundation—the Thermo Fisher Foundation for Science—has strengthened its commitment to enhancing STEM education. In 2012, it pledged more than $1 million for science education efforts.

Prior to joining the company, Casper served as president, chief executive officer and a director of Kendro Laboratory Products. Before Kendro, he was president-Americas for Dade Behring Inc., a $1.3 billion global manufacturer and marketer of products and systems serving the clinical diagnostics market. He served as executive vice president for Europe, Asia and intercontinental for two years before that.

Casper began his career at Bain & Company as a strategy consultant and later joined Bain Capital, where he oversaw business development, strategy and business integration in select companies owned by Bain.

Casper received an MBA with high distinction from Harvard Business School and is a graduate of Wesleyan University, where he received a bachelor’s degree in economics.

Why do you believe STEM education and workforce development are critical to our nation’s future? According to recent research by the Manufacturing Institute and Deloitte, our country’s manufacturing sector cannot find people with the necessary skills to fill nearly 600,000 open jobs. This skills gap doesn’t bode well for U.S. competitiveness, especially since an estimated 2.7 million new STEM-related jobs are expected by 2018. Today’s youth can benefit from a variety of programs, from mentoring, job shadowing, apprenticeships and workforce training. All of these are necessary to attract and cultivate the best talent.

Beyond standards, what are the first steps we should take to curb the STEM education crisis? While standards that establish minimum performance levels are important, teacher training is perhaps even more critical to long-term success of STEM education. In fact, President Obama is calling for the training of 100,000 new science, technology, engineering and math teachers over the next several years. The National Math & Science Initiative is a step in the right direction, it effectively engages with leading business and technology companies to actively join the effort. Private sector involvement in helping achieve the President’s teacher training goal is vital to its eventual success.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities? From their earliest school years to college and graduate programs, students gravitate toward fields promising financial reward, stability, excitement or fame. All of that is possible with a STEM education. But we need leaders, starting with teachers in primary school, who can create and sustain excitement for STEM subjects and celebrate individual successes in relevant fields, especially among young women and underrepresented groups. While teachers are planting seeds, leaders in the business community must shine brighter lights on STEM achievements. If we can drive energy and excitement through teachers in primary and secondary schools, build more robust STEM programs in U.S. colleges and universities and publicly and purposefully celebrate achievement in media, we can turn STEM careers into the hottest careers within the decade.

What is the key to making smart STEM investments? Any philanthropic investment must align with a company’s mission and be tied to metrics that demonstrate program effectiveness. Starting with our mission to enable our customers to make the world healthier, cleaner and safer, our STEM investments are well-placed if we are helping build a talent pipeline that benefits our customers in the future. And a thriving marketplace in the future bodes well for our business globally, which is something that is important to our employees and shareholders.

Which of the STEM initiatives your company supports gives you the greatest pride? We’re extremely proud of our participation in The Massachusetts Math + Science Initiative (MMSI), a $30 million initiative organized jointly by Mass Insight Education and Commonwealth of Massachusetts to help close the achievement gap for under-served students. Our $1 million contribution, funded through the Thermo Fisher Foundation for Science, is having a measurable impact on STEM education. The program provides a range of programs, including teacher training, that support and encourage students, broadening their interests in STEM subjects. Through its rigorous Advanced Placement (AP)-driven, performance-based programs, MMSI is making a difference. Our employee led Community Action Councils encourage volunteerism and employee engagement with STEM organizations. In 2013, we introduced a STEM scholarship program, partnering with premier universities. All of these efforts will continue to address the achievement gap we are facing with STEM education.

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Peter J. Davoren
President and Chief Executive Officer
Turner Construction Company

Turner is a North America-based construction services company. It first made its mark on the construction industry by pioneering the use of steel-reinforced concrete, which enabled the company to deliver safer, stronger, and more efficient buildings to clients. Turner continues to embrace emerging technologies, update and refine processes, and remain responsive to the needs of their employees, clients, and the communities it serves.

Using the principles of Lean construction, Turner minimizes waste and maximizes the use of time, labor, and materials. Turner has become the leading industry exponent of Building Information Modeling (BIM) to fully coordinate all team members working on their projects. As a founding member of the U.S. Green Building Council, Turner has long been involved in environmentally-sensitive building practices. Turner now has more than 400 green projects either completed or in progress. With an annual construction volume of $9 billion Turner is the largest general builder in the United States.

How do you believe STEM education can improve a nation’s competitiveness?
I find the quality most commonly shared by college graduates with degrees in science, technology, engineering, or math is the desire to make a difference. They are problem-solvers in search of solutions, and want to have a positive effect on the world in which we live.

Many of those with STEM education are drawn to the construction industry because of its enormous impact on so many different aspects of modern life. They read about the need to improve the infrastructure of a city, hear of the need for a healthcare facility in a rural area, or see an empty space a community center might fill, and they want to be part of the team that repairs, builds, and creates.

What principles do you apply to your professional and personal life to advance STEM education?

I am honored to be on the board of the ACE Mentor Program. The ACE Mentor program provides high school students the opportunity to work on design and construction assignments in teams that include members of the construction industry, from developers to tradesmen. Students are given access to current technology for estimating, scheduling and modeling their assignment projects and they visit construction sites and offices to see firsthand what goes into completing a project.

In addition, each summer Turner hires 350 interns. We help and encourage them to make the most of their natural gifts and their willingness to work hard. Our internship program is more than a summer job — it’s a professional and educational process that prepares students for a successful transition to a challenging and rewarding career. It’s also a chance for Turner to see students in action, matching the talents and interests of students to the emerging needs of our business.

What do we need in the US to continue to be at the top of global innovation?

We need to continue to advance the message regarding the opportunities available for developing innovative solutions to significant global issues through education and careers in STEM. Students in the STEM field are well aware that the great strides made in technology highlight the need for constant innovation and improvement. How can we build greener schools? How can we build more effective hospitals? Natural light and better indoor air quality are conducive to both learning and healing. Energy efficiency means available funds can be allocated more effectively.

These are the kinds of challenges that will inspire the upcoming generation of engineers. An energy-efficient, technologically advanced facility will provide increased opportunities in communities across the country.

Ideas and possibilities can come from the most unexpected sources, which is why collaboration and communication is so vital to our industry.

What is your company connecting diversity initiatives with STEM initiatives?
The CEO of every company was given a chance and an opportunity to succeed. He or she was assisted in advancing their career by people who believed in them. At Turner, we work hard to foster an environment where employees feel that not just one, but many people are invested in their success. Teamwork makes a project succeed. The more diverse the team and varied the perspective, the better the outcome. We encourage employees to network, to join groups such as the Society for Asian Scientists and Engineers, the National Society of Black Engineers, the Society of Hispanic Professional Engineers, and the Society of Women Engineers. We encourage them to reach out for help if they need it, and to offer it to others whenever they can.

What counsel would you provide around “collaboration to achieve success” in STEM Education and work force?
I would stress the importance of connections, and of being part of a larger whole. We want every employee to truly believe they can make a lasting impact on our company, and in the communities in which we build. Companies can increase both their morale and their bottom line when they produce a tangible product that strengthens people and communities. Our employees have great pride when they look at a new school, a new hospital, or new community center and say, “I helped to create it.”

When it comes to one’s professional life, that feeling of visible achievement, of giving back, is a difficult one to top.
Why do you believe STEM Education/workforce development are crucial to our nation’s future?

A number of economic studies have found that half or more of the nation’s Gross Domestic Product (GDP) growth in recent decades can be attributed to progress in technological innovation.

Meanwhile, per the revealing study, “Rising Above the Gathering Storm Revisited” by the National Academy of Sciences (NAS), National Academy of Engineering (NAE) and the Institute of Medicine, the U.S. is slipping in its readiness to compete in a global digital economy. Specifically:

- The U.S. ranks 20th in high school completion rate among industrialized nations and 16th in college completion.
- The U.S. ranks 27th among developed nations in the proportion of college students receiving undergraduate or engineering degrees.
- In 2009, more than half of U.S. patents were awarded to non-U.S. companies.

In the coming years, the great majority of newly created jobs will result from direct or indirect advancements in science and technology. Education in these areas will be crucial to providing young people the skills they’ll need to qualify for these jobs.

For our part, engineering has been an important component of UPS’s success for more than a century. Technology drives our company and a skilled STEM workforce is essential to our success. That’s going to be crucial to the economic well being of the nation and UPS.

How is your company connecting diversity initiatives with STEM initiatives? Is this a part of your comprehensive strategy?

In conjunction with the UPS Foundation, our engineering function has partnered with several universities and professional organizations to provide scholarships and internships in STEM related fields of study to women and underrepresented members of minority groups. Since the late 1980s, the UPS Foundation has provided $3 million in funding for STEM programs and projects, supporting 88 agencies. At the local level, our engineers are personally involved with professional engineering societies. Our engineers serve as board members, as well as visiting professors at colleges, universities and K-12 schools.

The professional societies and academic initiatives we support include:

- National Society of Black Engineers (NSBE)
- Society of Women Engineers (SWE)
- Institute of Industrial Engineers (IEEE)
- American Indian Science and Engineering Society (AISES)
- Society of Hispanic Professional Engineers (SHPE)
- National Action Council for Minority in Engineer (NACME)
- Kettering University - AIM/LITE Program (Academically Interested Minorities/Lives Improved Through Engineering) Scholarship Program
- Georgia Institute of Technology - GIFT Internship program (corporations and colleges provide partnerships for K-12 STEM teachers during the summer so they can enhance the knowledge of their students and peers upon returning to the classroom)
- University of Michigan M-STEM scholarship program (UPS financially supports a scholarship program that enables students from underrepresented backgrounds to pursue engineering degrees)
- INROADS Internship Program

UPS participates in these programs to give back to the communities in which we live and do business. We view investing in the development of future employees, customers and global citizens as the right thing and the smart thing to do.

What area of STEM are you most passionate about?

Engineering has been a core competency at UPS since our early days. We’ve called it a “technology company with trucks” due to our significant and continued investment in technology. That investment helps us deliver world-class, highly efficient operational excellence, offer more sustainable products and services, and boost our customers’ profitability objectives.

How has your corporation coordinated investments in education with future workforce needs?

We’ve found that experiential education programs (co-operative education and internship) are invaluable ways for students to get a better understanding of their particular field of study and also to gain real-world, hands-on experience. These programs help students identify future employment opportunities and assist UPS in identifying talented potential employees. As an added benefit, UPS employees receive a fresh perspective on business approaches and gain exposure to new ways of doing things.

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities?

There’s no substitute for personal engagement. UPS has a long history of partnering with local school districts to introduce students to engineering and we’ll continue to do so. We’ve found many students don’t have a good understanding of what an engineer does and are therefore unable to make the association between the importance of math and the sciences to the technical disciplines.

Providing students the opportunity to participate in career days, robotics programs and the like helps students connect theory with real-world applications. It demystifies the STEM disciplines and changes the perception of math and science as “too hard.”

In addition to providing scholarships and internship opportunities at the college and university level, we also make presentations and participate in Q&A sessions with students in the classroom. We participate in professional society meetings, and provide opportunities for students to tour UPS facilities to gain a more practical understanding of engineering at UPS.
Mort Zuckerman
Chairman and Editor-in-Chief
U.S. News & World Report

Why do you believe that STEM education and workforce development are critical to our nation’s future?
Our future depends on the strength of our scientific spine. The skills derived from a STEM education are the mission-critical elements of the jobs of tomorrow, for they are directly linked to economic productivity and competitive products. Moreover, education is more closely correlated with upward mobility than anything else. It’s the best way to reduce excessive inequality in incomes and opportunities, and the best way to avoid having our society degenerate into a class system. The men and women who will make America’s tomorrow and the core of its economy are in its classrooms today, and there are too few of them in the fields of science and technology that create the dynamic of our economy today, the future of our economy, and the best-paying jobs.

How do you believe STEM education can improve a nation’s competitiveness?
A highly educated and skilled labor force is what drives innovation and production. As the nation shifts into a new, non-industrial economy, we will need a workforce to be technologically competent to manage and staff the science and technology businesses that create the high-paying jobs. Today, while 24 million Americans can’t find work, hundreds of thousands of employers can’t find workers. This year, according to the Bureau of Labor Statistics, we will add approximately 120,000 jobs requiring at least a four-year degree in computer science. As a result, we will only produce 40,000 graduates with such degrees. And each engineering job typically leads to five additional jobs, experts say. It’s astonishing that only a small fraction of the nation’s high schools offer an Advanced Placement course in computer science, when 40 percent of small businesses say they have job openings they can’t fill because applicants are unqualified—a percentage that has doubled in the last three years alone. Our shortfall in education is the economic equivalent of a permanent national recession.

Beyond standards, what are the first steps we should take to curb the STEM education crisis?
Besides strengthening public-school math and science curricula, early childhood education should be improved, and both the government and colleges should provide more financial and academic support. Students who excel in STEM. Fifteen years of research has shown that, of everything within the control of a school, the factor with the most effect on learning skills is the quality and effectiveness of teachers. So if we want students to better understand math and science, we must find ways to improve teachers’ knowledge of these subjects. We are going to have to rethink the process of recruiting, training, and supporting STEM teachers. Government must multiply funds for vocational training and invest more in community colleges, which can dramatically increase the pool of skilled workers. And broaden access to computer science.

What area of STEM are you most passionate about?

Who are you?

Mort Zuckerman
Chairman and Editor-in-Chief
U.S. News & World Report


The last print issue was published in December 2010, completing the transition to digital. This move made it possible for the U.S. News brand of service journalism to evolve with the introduction of several rankings products to benefit consumers while still maintaining the news and analysis content. U.S. News continues to innovate and grow, while maintaining its tradition of providing useful information for making important life decisions. In 2013 U.S. News has expanded its monthly audience to over 20 million unique visitors with 120 million page views.

Mort Zuckerman is the chairman and editor-in-chief of U.S. News & World Report and the chairman and publisher of the New York Daily News. He is also chief executive and chairman of Boston Properties Inc., a major real estate firm he co-founded after serving as senior vice president and chief financial officer at Cabot, Cabot & Forbes. Mr. Zuckerman is a regular commentator on Fox News and in U.S. News & World Report, and he is a national leader in education and STEM issues. He is the chairman of the Conference of Presidents of Major Jewish Organizations and a past president of the board of trustees of the Dana-Farber Cancer Institute in Boston.

Mr. Zuckerman is a graduate of McGill University, McGill Law School, the Wharton School of Business at the University of Pennsylvania, and Harvard Law School. He is a former associate professor of city and regional planning at the Harvard Graduate School of Design and a former lecturer in city and regional planning at Yale University.

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As CEO, Sajan Pillai provides leadership to all of UST Global’s professionals while heading up the company’s global business operations. His responsibilities include acquisitions, client development, global operations, and service delivery.

Mr. Pillai brings us his extensive background in the offshore IT industry, having served as co-founder of Softtek Systems in India and as an engineer in one of top three consulting services companies in India. He has also architected and managed several large software systems for MCI Telecommunications in the United States and subsequently held senior management positions in Tanning Systems, a U.S.-based software solutions company.

Mr. Pillai graduated with a degree in computer science and engineering from the College of Engineering, Trivandrum, India.

Why do you believe STEM Education/workforce development are critical to our nation’s future?

STEM creates the basic skill sets needed for innovation. Nations and humanity at large depend on innovation to solve increasingly complex problems in healthcare, resource constraints (food, water and air), energy and shelter. 15 out of 20 growth jobs of this decade require significant STEM skills; yet less than a third of the population has any exposure to core STEM education and significantly less are proficient at STEM to be able to specialize in jobs. The US is significantly behind the world leaders in STEM education at the primary and secondary level. We need an active collaboration agenda between government, public agencies, non-profit organizations and associations and private sector to drive STEM education themes forward.

How do you believe STEM education can improve a nation’s competitiveness?

In this era of increasing global competition, with the advent hyper connectivity and a flatter world, human capital specifically in STEM will become the single biggest asset of a nation. Without STEM talent, our nation would slip further in Innovation, which would be significantly detrimental to the economic development of our nation in spite of our natural resources. We are staggering behind in STEM education. We only produce 60,000 top engineering graduates, which in absolute numbers is 23rd in the world. Less than 17% of the entire student population is proficient at Math or science yet the STEM related job opportunities are growing 300% faster than NON STEM related jobs. Already, the average STEM job pays 75% more than average NON STEM jobs and that difference is increasing. We as a nation have declared STEM education as a national priority. However, we need an active education agenda with the collaboration of academicians, government agencies and private sector to make the difference.

What traits do corporate leaders need to effectively support and advance STEM education today?

Corporate leaders have several key and vital roles to play in STEM education. The most vital of them is being the advocate for standards at the national and regional level. Corporate leaders also can advocate parents to be active in the communities in STEM education. Corporate giving is another area where with clear and specific focus on ROI, we can redirect fairly substantial resources to STEM education agenda. Corporate leaders can also inspire the power and potential of volunteerism of their employee base to be effectively engaged in STEM education. They can also leverage their existing relationships and networks like community colleges to focus on STEM education with the 3 point agenda 1) Make STEM interesting 2) Educate the STEM educators 3) Make STEM Hands-On.

How can we can we do a better job to strategically coordinate all those engaged in STEM across the company?

Corporations often have a diverse workforce with multi region (multi country focus) with several departments. STEM support is often executed regionally with a central STEM support strategy. To do this, the pieces are to 1) evolve a central strategy that ties STEM education to the corporate workforce needs b) create a list of regional projects that focuses on innovative approaches to STEM education c) Create corporate wide metrics to build and monitor STEM progress d) Provide support structures like “Assets and expertise Maps” available within the corporation. With a head coordinator at the central level with clear regional projects, you can create a corporate model for sustained STEM support and success.

How is your company connecting diversity initiatives with STEM initiatives? Is this a part of your comprehensive strategy?

Diversity in STEM education is a current problem and a future opportunity. Today women and minorities are 28% of the workforce yet only 7% of it is STEM workforce. The earning potential of the population that is STEM trained is significantly higher (by 75%) than NON STEM jobs, which would give us opportunity for social inclusion at regional and national levels. Also in corporate environments, diversity in STEM is crucial for the “innovation pipeline”. Innovation is critically dependent on diverse human experiences and a diverse STEM trained work force can be the significant competitive asset of the corporation. It is therefore important to connect the diversity initiatives of the corporations with ongoing STEM initiatives. ■
AirTouch. He also served as PrimeCo’s chief technology management and CIo functions.

Prior to assuming his role as CEO in 2012, he served as Verizon’s president and chief operating officer, responsible for overseeing the deployment of the new company’s customer service operations and all-digital network.

McAdam has also served as vice president-international operations for AirTouch Communications and was lead technical partner for cellular ventures in Spain, Portugal, Sweden, Italy, Korea and Japan. McAdam joined AirTouch as executive director of international applications and operations in 1993.

McAdam is past chairman of the board of directors of the CTIA, the wireless industry trade association. He is a director of the National Academy Foundation, a partnership between business leaders and educators that helps high schools across the country establish and run technical and service academies to prepare students for college and careers. He is also a member of the Cornell University Board of Trustees.

Why do you believe STEM Education is critical to our nation’s future?

Verizon’s future depends on our ability to operate sophisticated networks, innovate, and use technology to solve problems. Therefore, we need employees with critical thinking and problem-solving skills and a solid grounding in science, technology, engineering and mathematics—and we are not alone. Experts estimate that more than 60 percent of all new jobs in the U.S. over the next 10 years will be STEM-related. Even as demand grows, the supply of innovative, technologically literate employees is not keeping pace, with the gap between available jobs and qualified workers growing larger and larger. Developing the STEM capabilities of our future workforce is a fundamental obligation of America’s business and educational leaders, as well as a vital component of a sound U.S. competitive strategy.

What do corporations need to do to create more STEM careers and fill existing jobs?

As a technology company, we rely on a steady stream of educated, STEM-qualified workers to fill jobs throughout our organization, and we use all available avenues to identify talented individuals. Our recruitment team works with colleges across the country to increase the awareness of employment opportunities at Verizon. We also attend numerous job fairs and work with many military organizations to attract qualified veterans to Verizon. The demand is there. The real issue for Verizon and the country as a whole is on the supply side of the equation. Corporations need to develop and implement a concerted strategy for finding intellectual capital and investing in the education of our young people so that we have a pipeline of capable workers to fill these vital knowledge-based jobs.

How has your corporation coordinated investments in education with future workforce needs?

Verizon has a responsibility—as well as a business interest—in developing the skills of today’s students who will be tomorrow’s employees. Since 2000, the Verizon Foundation has invested over $900 million in our communities, almost half of which has gone to support education initiatives. Our education investments and employee volunteer efforts are focused on increasing middle school and high school students’ interest in STEM. For instance, we encourage and support our employees who mentor students and expose them to the possibilities of technology-related careers. Recently, we launched the Verizon Innovative App Challenge in which students learn how to code and build mobile apps, skills that are needed for jobs in computer science, the fastest growing STEM field. We are committed to expanding opportunities more broadly across our society through our Verizon Innovative Learning Schools program, which provides math and science teachers in underserved schools with intensive professional development on how to use mobile devices like smartphones and tablets to increase student engagement and academic achievement. We also work with numerous national organizations such as the Society of Hispanic Professional Engineers to expose a wide variety of young people to the innovative technologies being developed at Verizon, as well as the exciting opportunities available for those who major in STEM fields.

How can we advance mentorships and apprenticeships in the STEM pipeline?

Verizon works with some great partners who are focused on this very issue. I have personally been involved with one such organization, the National Academy Foundation (NAF), for some time. NAF was created to prepare young people for career success by fostering partnerships between businesses and schools. NAF establishes academies in underserved schools and provides students with specialized curricula in fields like engineering and information technology. Verizon employees are very committed to the NAF program. They get involved by mentoring students, serving on local NAF advisory boards and hosting students at Verizon work locations where they hear from engineers, finance, and IT professionals about academic and career paths in the STEM field. We also offer internships to NAF students, who have an opportunity to work for a Fortune 100 company, build their resumes, sharpen their skills and develop professional contacts, while Verizon helps to shape future industry leaders.

Lowell C. McAdam is chairman and chief executive officer of Verizon Communications. Prior to assuming his role as CEO in 2012, he served as Verizon’s president and chief operating officer, with responsibility for the company’s network-based businesses, as well as the technology management and CIo functions.

Before that, McAdam held key executive positions at Verizon Wireless since its inception in 2000 and built the company into the industry’s leading wireless provider, with the nation’s largest, most reliable wireless voice and 3G broadband data network. He was president and CEO of Verizon Wireless from 2007 until being named COO of Verizon, and before that served as Verizon Wireless’ executive vice president and chief operating officer.

Earlier, McAdam was president and CEO of PrimeCo Personal Communications, a joint venture owned by Bell Atlantic and Vodafone AirTouch. He also served as PrimeCo’s chief operating officer, responsible for overseeing the deployment of the new company’s customer service operations and all-digital network.

Chairman and Chief Executive Officer

Verizon Communications
Mary Vermeer Andringa is President and Chief Executive Officer of Vermeer Corporation, a global industrial and forage equipment manufacturer located in Pella, Iowa, USA. Prior to assuming her current role in November of 2009, she was President and Co-CEO for six years. Her earlier roles at Vermeer have included chief operating officer, focusing on her passion for continuous improvement and innovation.

Due to her successful tenure at the family-owned and—managed company, as well as her reputation as an expert ambassador for manufacturing, Ms. Andringa is sought after as a speaker and spokesperson. She was named co-chair of the Governor’s STEM Advisory Council in Iowa, effective July 2013, and is past chair of the National Association of Manufacturers, the nation’s largest manufacturing association. Ms. Andringa is one of 18 private manufacturers, the nation’s largest manufacturing association. Ms. Andringa is one of 18 private manufacturers, the nation’s largest manufacturing association. Ms. Andringa is one of 18 private manufacturers, the nation’s largest manufacturing association.

Mary Vermeer Andringa is also involved in the following boards: Member of the Vermeer Board of Directors; Director of the Herman Miller Co., Zeeland, Michigan; Past Chair of the Iowa Association of Business and Industry; Trustee for the Fuller Theological Seminary, Pasadena, California; and Trustee Emeritus at Central California University. Vermeer has an office presence in the University’s Research Park, creating the perfect intersection where we not only engage our future workforce but also have an onsite, student engineering team that works on specialized projects and research. As Vermeer continues to have dozens of job openings at any given time, it’s estimated that only 20% of new hires are truly qualified for the job. Building relationships—in ways such as this Research Park collaboration—accommodates—brides the skills gap that we must fill to meet the ever-changing needs of our global base of customers and employees.

What area of STEM are you most passionate about? I’ve always been very interested in education, in continuous learning, and as a former teacher, I see the importance of emphasizing all areas of science, technology, engineering and math with our students. I’m particularly conscious of how important it is to make more inroads with younger women in the STEM fields.

Why do you believe STEM Education/workforce development is critical to our nation’s future? A successful American economy is dependent on a thriving workforce. During my tenure as chair of the National Association of Manufacturers, we laid out a scenario that will bring our economy, as well as manufacturing, to new levels by the year 2020. That plan is dependent upon creating jobs and building a workforce that meets current and future economic demands. However, it will require a steady stream of talent emerging from our K-12 system interested in and capable of pursuing post-secondary study in STEM so as to enter the STEM workforce. A recent (March 2013) TechNet poll showed that 77 percent of Americans want increased spending in STEM education, acknowledging that we need these skills to be competitive in the global marketplace. As STEM jobs are predicted to grow three times faster than non-STEM jobs during the next decade, investing in STEM education, collaboration and opportunities only makes sense in order to grow and support our nation’s economic future.

How has your corporation coordinated investments in education with future workforce needs? There are several examples, but one of our most recent efforts is a collaboration with Iowa State University. Vermeer has an office presence in the University’s Research Park, creating the perfect intersection where we not only engage our future workforce but also have an onsite, student engineering team that works on specialized projects and research. As Vermeer continues to have dozens of job openings at any given time, it’s estimated that only 20% of new hires are truly qualified for the job. Building relationships—in ways such as this Research Park collaboration—accommodates—brides the skills gap that we must fill to meet the ever-changing needs of our global base of customers and employees.

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Mike Duke
President and Chief Executive Officer
Wal-Mart Stores, Inc.

Under Mike’s leadership, the company’s international business became a fast-growing part of Walmart’s overall operations. In leading Walmart’s expansion into mature and emerging markets, Mike built an international management team that delivered strong operational results in a complex global environment. Before Wal-Mart, Mike worked for 23 years in retailing with Federated Department Stores and May Department Stores.

Mike has served on the board of directors of Wal-Mart Stores, Inc. since 2008, the board of directors of The Consumer Goods Forum, the executive committee of Business Roundtable and is on the executive board of Conservation International’s Center for Environment Leadership in Business. He also serves on the board of advisors for the University of Arkansas and the advisory board of the Tsinghua University School of Economics and Management in Beijing, China.

Mike graduated from Georgia Tech with a bachelor’s degree in industrial engineering, and he is a member of the National Academy of Engineering.

Why do you believe STEM Education/workforce development is critical to our nation’s future? For America to be competitive in today’s global environment, our businesses need to be able to find top talent. More and more jobs today require technical training—across all industries and fields. At Walmart, we are seeing firsthand that STEM education and workforce development today will be vital for growing our business tomorrow. If we do not encourage young people to major in STEM fields, we simply will not have the talent pool to meet the demand.

100 Women Leaders in STEM ©2012 STEMconnector™ All rights reserved

How do we encourage students to continue their study of STEM subjects, particularly women and underrepresented minorities? We know that women and some minority groups are underrepresented in STEM fields, and that means we are not drawing all of the best talent. To broaden the talent pool, we need to engage early and often. We need mentoring and strong curriculum at the K-12 level and mentorships at the college level. We have also found great value in bringing students together through summits and other activities that deepen their involvement in STEM.

What area of STEM are you most passionate about? I’m passionate about the value of a STEM education—not just for scientists and mathematicians but for anyone who wants to make their mark in the world. My own training is as an industrial engineer. I chose that field on the advice of a high school teacher who told me: “Industrial engineering is human engineering. It’s about people, processes, and it’s very broad. You’ll learn a little bit about a lot of things.” Most of all, what I learned how to do was to think.

What I love about STEM is that it teaches you to use data and logic and to apply critical thinking to find solutions. These are skills that everyone in the workforce should have.

Where do you see the biggest area of opportunity in advancing STEM jobs / careers? One area where we see a growing need for STEM graduates is in Big Data. This is increasingly important for our business as we grow our e-commerce operations and as we seek to understand our customers better across our company. With more data and advanced analytics also comes an increased need for cyber security. We want to help our customers get what they want and need, while putting the highest priority on protecting customer and member information.

How can we advance mentorships and apprenticeships in the STEM pipeline? At Walmart, we support the following key business practices to improve the pipeline for the next generation entering the workforce: better visibility to STEM fields within our business so students can understand the career opportunities that will be available; support of formal mentoring and internship programs; and a continuing focus on the importance of diversity and inclusion across the business. Through all of these steps, we believe it is vital to engage with our nation’s colleges and universities to help them create the best possible experience and future for their students.

“We know that women and some minority groups are underrepresented in STEM fields, and that means we are not drawing all of the best talent.”
Innovation for tomorrow begins with leadership today

At KPMG LLP, we recognize that STEM education plays a critical role in enabling the U.S. to remain the economic and technological leader of the global marketplace of the 21st century.

KPMG proudly congratulates the 100 CEO Leaders in STEM for their leadership and extraordinary contributions to science, technology, engineering, and math education. There are no limits to where insights and innovation can take you.

kpmg.com
When business collaborates with academia to enhance STEM education, we serve our students well. Needs are identified; skills and experiences are transferred efficiently and effectively.

—John Veihmeyer, Chairman and CEO, KPMG U.S.

Given the rapid speed of change in today’s global marketplace, a country must invest in its greatest asset—its people—and train them to excel in science, technology, engineering, and math.

—John Chambers, Chairman and CEO, Cisco

In a world where countries are competing like companies, the best educated and most talented workforce is a critical factor for success.

—Andrew N. Liveris, President, Chairman and CEO, The Dow Chemical Company

Science, technology, engineering and math are the foundation of innovation in this era of global competitiveness. Without STEM talent, the U.S. risks mediocrity, which would have unfortunate implications for our economy, industries and national security.

—Bill Swanson, Chairman and CEO, Raytheon Company

By getting today’s students passionate about careers in science, technology, engineering and mathematics, we create the pipeline of talent necessary to develop the leading technologies that will continue to be the backbone of our economy as well as our security and quality of life.

—Jim Heppelmann, President and CEO, PTC

Future job growth will be in STEM disciplines, and a nation aspiring to be a global leader can use STEM education as a perfect platform for economic growth and prosperity.

—N. Chandrasekaran, CEO and Managing Director, Tata Consultancy Services