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“This Problem Is About U.S. Competitiveness Writ Large”

IBM’S EDUCATION PARTNERSHIPS BUILD THE STEM WORKFORCE OF TOMORROW

Featuring an interview with:

Stanley Litow
Vice President for Corporate Citizenship and Corporate Affairs at IBM and President of the IBM International Foundation

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Public-Private Partnerships Are Essential to Solving STEM Crisis

The demand for skilled, agile science, technology, engineering, and mathematics (STEM) workers has never been greater. Technology isn't just the backbone of today's companies: It drives and enables businesses. Yet the students who should fill the STEM pipeline of tomorrow's workers simply aren't ready to meet industry demands. They're either opting out of STEM careers at an early age or graduating without the skills they need to land top-notch jobs.

This problem isn't just an industry issue: It is a national and even global problem, says **Stanley Litow**, **Vice President for Corporate Citizenship and Corporate Affairs at IBM and President of the IBM International Foundation**.

Industry's solution is to cast a new vision—one in which partnership drives reform. "We need to look at this STEM shortage as beyond just the doors of IBM: It's so large that no one segment of society is going to solve it operating on its own," says Litow. The way forward? Industry and education must opt in, working synergistically to build the STEM pipeline.

Skills Deficits Keep Students From Succeeding at Work and at School

Even as industry experts forecast exponential growth in STEM-sector jobs, the U.S. is posting sky-high youth unemployment numbers. Currently, 20 percent of 16- to 19-year-olds and 11 percent of 20- to 24-year-olds are unemployed.[1] American students just aren't making the grade when it comes to post-secondary education. "If you look at the United States, our projections are that over the next 10 years, something like 13 million new jobs will require middle skills—the kinds of skills that are valued by most large companies, not just IBM and other STEM companies. But right now, only 25 percent of U.S. students with a high school diploma who register at a community college complete that two-year program. The completion rate in four-year colleges is around 40 percent," notes Litow.

The reason? Most students exit high school with a serious knowledge and skills deficit. In 2013, ACT scores for high school graduates reveal only 26 percent met all four "college-readiness" benchmarks in English, mathematics, reading, and science.[2] Such numbers not only limit college success, they shortchange opportunities for future earnings. "A very large percentage of

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young people who come out of high school are not college- or career-ready and are unable to complete post-secondary education work. They go back into the labor force with only a high school diploma, and the research indicates that their salary will then max out at about $12 an hour," observes Litow.

"If we don't do something radically different, the U.S. will not be competitive," says Litow. "It's at a crisis level."

No Solo Act: Partnerships Drive Research, Boost Skills

Central to IBM's vision for change is the knowledge that companies can't go it alone. Systemic, multi-faceted problems require integrative solutions, as Litow explains: "That's why we work in close partnership with K-12 systems and higher education to feed the pipeline, so that the significant increase that's needed in the new employee base is addressed through a collaborative set of programs."

IBM is placing its bets in a wide range of areas, including partnerships with higher education that help teach and train the next generation of STEM workers. The company funds innovative research projects that align with its corporate priorities: "We have a shared research program where we provide significant grants to higher education institutions in the United States and around the world to work on joint projects involving the most up-to-date technologies," says Litow. This partnership helps keep students' skills current and job-ready. Adds Litow, "Our goal is to build students' capabilities in big data and analytics, cloud computing, and social and mobile solutions that will prepare the workforce with the relevant skills we need as we head into the future."

Working Together to Effect High School Reform

IBM's collaboration with higher education institutions also includes a heavy focus on early intervention. Working closely with colleges and universities, the company has pioneered a six-year (grade 9-12, plus early college) model that is being implemented in a number of public school districts nationwide. Called P-Tech (Pathways in Technology and Early College High School), these innovative schools offer classes in core subjects as well as computer science. Students pursue college coursework starting in 10th grade and graduate with both a high school diploma and an associate degree. Workforce skills are embedded directly into the curriculum, Litow says, positioning students to take on challenging roles in industry upon graduation.

Targeting an at-risk, mostly minority student population, IBM developed P-Tech schools in partnership with the New York City Department of Education, New York City College of Technology, and The City University of New York. What's the formula? Says Litow, "We have demonstrated that by providing a different type of instruction, mentors for every student, structured workplace visits, workplace learning curricula, and paid internships, we could set a higher standard—and even exceed that higher standard with students taking and passing college courses in an impressive amount of time."

In Chicago, IBM has used P-Tech's model to launch the Sarah E. Goode STEM Academy. The academy is also built around the concept of public-private partnerships, joining the efforts of IBM, Chicago Public Schools, Northwestern University, and City Colleges of Chicago-Daley. P-Tech's template for high school reform is scalable, sustainable, and replicable, Litow states. And it's already quite successful: By September 2015, more than three dozen P-Tech schools will be in operation. IBM is lobbying hard for expansion: "Now we're trying to get a reauthorization of the Perkins Act, so that the $1.3 billion in federal money that's allocated for career and technical education would create incentives for states and school districts to create programs along this model," he says.

A Rising Tide Lifts All Boats

As IBM's experience with P-Tech shows, industry-education collaborations benefit all key stakeholders. At-risk students receive the targeted education and supports they need to pursue STEM careers, as well as a vision of their possible future through mentoring relationships with STEM professionals. Schools receive frameworks and

curricula for students, as well as ongoing input from industry experts. Higher education institutions benefit from corporate financial support for research that transforms industry and helps train students. And companies like IBM know that they are expanding the national STEM talent pool, educating and preparing the students who could one day become their workers or customers. Says Litow: "Building the skills and talents of our clients is as important as developing our own internal skills, because we are a business to business company. We can't find solutions purely on the basis of our own financial spending, leadership development, and HR systems."

Investing in the Future

For today's technology-driven companies, the STEM workforce crisis is the new normal. But so, too, are public-private partnerships, which enable education and industry to work together cooperatively to prepare students for high-skills corporate jobs. Tomorrow's workers won't wait until graduation to learn about industry challenges and opportunities: They'll gain that exposure beginning in high school—or sometimes even earlier. Now, more than ever, American students need to be trained, agile, and prepared. Says Litow, "There was a time when people thought you did all of your learning in university and then you came to work and did one job and worked towards promotion, but your skills were at a constant level. That's no longer true. Whole elements of the workforce have been transformed and skill needs have changed. That includes both specific skills, such as software development and services and technical leadership, but also other skills about acquiring culture adaptability, being able to learn to work in teams across geographic barriers, and solve problems. You can't stay still or stagnant. And you can't play catch-up, really. You have to be in front of these things."

That's why companies like IBM are working closely with institutions of higher learning to make a mid-course correction and invest in the skills development and education of the next generation of STEM workers. Says Litow, "If we are able to turn the STEM crisis around, the benefits will accrue to companies like IBM and to other large companies, but also to the broader society—ensuring that we have a workforce in the 21st century that can do the work, earn the wages that those jobs provide, and contribute to the growth of the economy."

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Endnotes

1. US Department of Labor, Bureau of Labor Statistics, "*Selected Unemployment Indicators, Seasonally Adjusted*," Economic News Release, July 2014, http://www.bls.gov/news.release/empsit.t10.htm.

2. The ACT, "*The Condition of College and Career Readiness 2013- Nationa*l," (Iowa City, IA: ACT, 2013), http://www.act.org/research/policymakers/cccr13/pdf/CCCR13-NationalReadinessRpt.pdf.