

Raytheon Company

Response to Commission on Enhancing National Cybersecurity Request for Information

Original research about the cybersecurity workforce shortfall

As stories in the news of digital attacks against individuals and companies are becoming a common reality, the high demand globally for cybersecurity professionals keeps growing as the threat increases. A record 79 percent of U.S. businesses reported a cybersecurity incident in the last year, and the 238,158 job postings for cybersecurity-related jobs in 2014 is an increase of 91 percent from 2010. In the United States alone, companies posted 49,493 jobs requiring Certified Information Systems Security Professional (CISSP) certification last year; however, there are only 65,362 CISSP holders, the majority of whom are already employed. This talent gap has serious implications for domestic and international economics and security and must be addressed.

To shed some new light on how we should tackle this worldwide issue, Raytheon and the National Cyber Security Alliance (NCSA) commissioned *Securing Our Future: Closing the Cyber Talent Gap*, a survey to understand the career interests and educational preparedness of millennials (ages 18 to 26) in 12 countries around the world. 2016 will mark the fourth consecutive year Raytheon and NCSA have commissioned the survey. This study was fielded by Zogby Analytics, which also conducted all previous surveys.

It is imperative for the national security of our country and its allies that the workforce pipeline for cybersecurity professionals be filled with sufficient qualified workers. This survey is intended to give insights into the root causes of the global cybersecurity talent gap.

Results from the 2015 survey indicate that millennials aren't aware of cybersecurity job opportunities, but they are or could become interested. The survey has shown that millennials would likely pursue a cybersecurity career if they were aware of what the job entails.

Young adults say they want careers that use skills required for cyber careers, but they do not have the skills needed to pursue such jobs. Schools are also not preparing young adults for these jobs—and there is a gap within the gap—with females less interested and informed about careers in cybersecurity than their male counterparts. In the United States, fewer women are looking at a career in security, as the 2015 gap between young women's interest in the field versus that of men was five times less than a year before. Nearly half of millennials surveyed say cybersecurity programs such as competitions, internships, and scholarships are not available to them.

Recommendations

With this knowledge and survey results, we can chart a course forward, which requires active collaboration between business sectors, the government, and our entire education system. A path forward could include awareness, education, and mentoring collaboration. This multifaceted approach is required if millennials and future generations are to become the sharp,

aware, and talented cyber defenders our societies need. Specific recommendations for reducing the current cybersecurity talent gap include:

- Implement new awareness campaigns in partnership with non-profits, industry, entertainment, and government, aimed at millennials with respect to the need, desirability, and availability of cybersecurity jobs.
- Establish industry consensus around core messaging with respect to cybersecurity jobs, so common taxonomy can help drive awareness and understanding.
- Create information-sharing mechanisms across nonprofits, industry, and government to rapidly transform emergent threats into industry awareness and actions.
- Require basic cybersecurity education for all levels of public schools, and encourage private schools to participate.
- Provide business incentives for industry to deepen investments in STEM education and awareness efforts, especially for girls and minorities.
 - Provide incentives for increased cybersecurity scholarship investment by industry.
 - Partner with non-profits and industry to create new cybersecurity competitions, and provide official recognition for participation.

About Raytheon

Raytheon Company, with 2015 sales of \$23 billion and 61,000 employees, is a technology and innovation leader specializing in defense, civil government, and cybersecurity solutions. With a history of innovation spanning 94 years, Raytheon provides state-of-the-art electronics, mission systems integration, C5I™ products and services, sensing, effects, and mission support for customers in more than 80 countries. Raytheon is headquartered in Waltham, Mass. Visit us at www.raytheon.com and follow us on Twitter [@Raytheon](https://twitter.com/Raytheon).

Developing the Next-Generation Cyber Workforce

In the United States, the National Collegiate Cyber Defense Competition (NCCDC), presented by Raytheon, provides college students the opportunity test their skills at protecting a network against cyber threats. Raytheon also provides technical resources and employee volunteers to the event. The tournament-style competition sees student-only teams from 180 U.S. colleges and universities each year.

Our annual global research study, *Securing the Future: Closing the Cyber Talent Gap*, centers on the potential of the Millennial generation to choose cybersecurity careers and fill the gap. The Raytheon Women's Cybersecurity Scholarship, administered by the Center for Cyber Safety and Education, provides tuition assistance and paid internships to encourage women to pursue cybersecurity degrees.

Raytheon's Cyber Academy, a global cyber education program, reflects our commitment to develop the next generation of cyber talent worldwide. The academy launched in 2016 in the United Arab Emirates (UAE) with a vision for expansion to additional countries.

And while the United States faces a shortage of cyber defenders, the need for talent is even greater in other countries. To help bridge this worldwide gap, Raytheon launched a global cyber education program with two key events in the UAE.

- UAE Security Forum: “Bridging the Cybersecurity Talent Gap”—a one-day event focusing on development of cyber talent. The forum brought together government, academic and cybersecurity industry leaders to identify actions needed to develop cyber talent. Raytheon partnered with the Arab Gulf States Institute in Washington to present the UAE Security Forum.
- A four-day cyber educational workshop at Khalifa University that taught students new cybersecurity skills. A four-day cyber skills workshop, taught by two experts from the Center for Infrastructure Assurance and Security at the University of Texas-San Antonio in the United States, was held for 55 Khalifa students. It taught students how to secure Windows server and operating systems.

Raytheon also sponsors the Cyber Security Challenge UK, an event series that tests amateur applicants with cyber skills.

The company has several executives currently serving on the advisory boards of different colleges and universities, and runs internship programs that brings college students into the business to learn firsthand. Other Raytheon initiatives include MathMovesU®, an ever-expanding family of unique initiatives and key partnerships that connects with students from elementary school through college to address the STEM education crisis; the Raytheon MATHCOUNTS National Competition; and Teachers in Industry, a program through the University of Arizona that gives teachers summer internships so they can bring knowledge back into the classroom.

STEM Education

Engaging students with MathMovesU

Mentoring and inspiring students to pursue STEM careers is the central mission of our MathMovesU® program. We believe it is our responsibility to help students from all backgrounds gain opportunities for robust education in math and science. Through MathMovesU initiatives, we engage with students from elementary school through college, support educators and policymakers, and promote racial and gender equality within STEM fields.

Focusing on STEM career paths for girls

At Raytheon, we believe that the best ideas come from diverse teams of people from different backgrounds and perspectives. That's why we are sharpening our focus on STEM career paths for girls to help build and prepare the next generation.

Each year, we organize Girl Day events nationwide as part of DiscoverE's® National Engineers Week. We are helped by Raytheon employee volunteers who believe inspiring girls to pursue STEM will have a long-term impact on individual and collective success. We are pleased to have won the Women in Engineering Proactive Network's DiscoverE award for our Girl Day efforts.

Bring math to life

Our traveling museum exhibition, [MathAlive!](#), is designed to inspire, spark the imagination, and reveal not only math at work, but the endless possibilities of math. Since the launch in 2012, the exhibition brings to life the real math behind what kids love most—video games, sports, fashion, music, robotics, and more—and creates interactive and immersive experiences that bring to life the math at work in each, whether in design, application, or use. MathAlive! is touring military communities the United States as well as countries in the Middle East.

MATHCOUNTS®

Every year, nearly 6,000 schools and more than 17,000 volunteers participate in [**MATHCOUNTS**](#), a national competition program that promotes mathematical achievement with middle school students across the United States. The program culminates in the Raytheon MATHCOUNTS National Competition, which brings together 224 middle school mathletes from all 50 states, D.C., U.S. territories and schools from the Departments of Defense and State. In addition to serving as the title sponsor of the MATHCOUNTS National Competition (through 2018), we are a supportive partner of the [**MATHCOUNTS Foundation**](#), a nonprofit organization that helps U.S. middle-school students excel in math. We provide financial contributions to help middle school students become creative problem solvers and develop the skills needed to become the math and science leaders of the future.

Measuring STEM Success

We have partnered with U.S. News & World Report® in developing the first-ever index to track eight key indicators of STEM activity in the United States. The index shows that high school student aptitude for and interest in STEM professions have not kept pace with demand. Moreover, gender and ethnic gaps remain wide among students interested in STEM.