Shaping the Future Workforce

Roundtable Case Studies of Successful Business/Education Partnerships
About the Massachusetts Business Roundtable

The Massachusetts Business Roundtable is a non-profit, non-partisan public policy organization comprised of CEOs and senior executives from major employers that collectively employ more than 250,000 people in diverse industry sectors across the state. The Roundtable works with business leaders and public officials to make Massachusetts a more competitive place to do business in the global economy. For more information, visit online www.maroundtable.com or follow on Twitter @MABizRoundtable.

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Introduction

The skilled workforce, the innovation hub, and the strong public school system combine to create many advantages for Massachusetts employers. Yet, despite these advantages, there remains a lack of alignment between the skills of workers and the needs of businesses. Businesses consistently report that they find a large disconnect between the talent that is coming out of schools and the talent they seek.

- According to a 2016 survey of 400 employers from across Massachusetts, 75% said that it was difficult to find people with the right skills to hire in Massachusetts.
- Despite these difficulties, the survey found that employers are generally happy with the education system in Massachusetts, with 50% of respondents giving the system an A or B.¹

It is apparent, then, that while students receive a high quality education in Massachusetts, there remains a persistent gap between what businesses seek in new employees and the set of skills that schools are imparting. To close this gap, a number of businesses are creating partnerships directly with education intuitions. These partnerships allow businesses to have a larger stake in shaping the Massachusetts talent pool. In short, employers are helping to create a pipeline of workers who have the skills and interests that they seek.

Purpose

The purpose of this report is to highlight a selection of successful partnerships that Massachusetts Business Roundtable members have created with education institutions. This selection does not capture every partnership in which Roundtable members are engaged but rather highlights the wide variety of ways in which businesses are partnering with education institutions to help shape the future workforce.

Findings
There is no single way that employers go about creating these partnerships. Businesses across all different industries, including healthcare, technology, financial services, professional services, energy, and real estate development and construction, are collaborating with schools to create mutually beneficial partnerships. Some companies are collaborating with an individual school or university to teach a very specific curriculum while others have general partnerships that engage future workers in STEM or other fields.

These partnerships exist across all education levels, from elementary schools to colleges and universities. Employers may choose to engage with different education institutions depending on the type of partnership that best meets their interests and needs. Some choose to partner with colleges, while others partner with vocational and technical high schools as a way of training the future workforce. Others engage younger students as a way to inspire them in an area of study, such as engineering.

Through Roundtable member submissions, three types of partnerships that are helping to create a workforce pipeline emerged:

**PARTNERSHIP 1**
Engaging and Inspiring the Future Workforce
Some companies take a more general approach to their partnerships with schools. Examples of this approach include exposing students in younger grades to STEM with in-class demonstrations, having a high school summer internship program for less advantaged students, and creating mentor programs that bring together employees and young kids. This type of partnership allows businesses to work with education institutions in a wide variety of ways to excite the prospective workforce for their future.

**PARTICIPATING MEMBERS**

![Participating Members](image)

**PARTNERSHIP 2**
Targeted Curriculum and Training Partnerships
Some businesses favor focusing on direct connections with schools to create specific curriculum and training opportunities that will produce workers with the skills that they need the most. Examples of these targeted partnerships involve a business partnering with a particular school to create programs that combine classroom learning with specialized worksite experience. After participating in targeted partnerships, students leave school with a set of skills identified by employers while also making valuable connections with possible future employers.

**PARTICIPATING MEMBERS**

![Participating Members](image)

By visiting classrooms and educational groups from Pre-K through college, all ages can see just how amazing STEM can be.

After participating in targeted partnerships, students leave school with a set of skills identified by employers while also making valuable connections with possible future employers.

Shaping the Future Workforce: Roundtable Case Studies of Successful Business/Education Partnerships
Some companies choose to impact the future workforce by creating opportunities for current employees. Often times this means partnering with education institutions to set up a series of courses and/or training that will specifically prepare an employee for advancement within the company. Examples include companies partnering with a community college to design a series of courses that will allow employees to gain the necessary skills to advance within their company. In some cases, the partnership is arranged such that the program is free-of-charge to students.

Drivers of Success

There are lessons learned from these different types of partnerships. Despite the different approaches, Roundtable members consistently name similar lessons that appear to apply to almost all partnerships. The most common elements of a successful partnership include:

- **Adaptable.** Adapting the goals of the program over time is important because it allows both the business and the education institution to come together and adapt to any changes, thus increasing the likelihood of the success in the program;
- **Responsive.** Acknowledging and being responsive to the different needs of students is necessary in order to ensure that the maximum number of students are able to complete the program;
- **Accountable.** Empirically measuring outcomes of these partnerships (i.e. completion rates, costs, attendance) allows for concrete analysis on the program’s impact;
- **Affordable.** Emphasizing low cost is incredibly important in order to maximize the number of students who are able to participate thus increasing the impact of the program; and
- **Leadership.** Commitment by senior-level leadership is imperative, and allows for a mutually beneficial partnership.

The partnerships highlighted in this report represent a variety of successful collaborations between businesses and education institutions across a wide range of industries and partnership types. These collaborations work to benefit both the workforce of Massachusetts as well as the businesses looking to hire this talent. The Massachusetts Business Roundtable is proud that these companies are taking the initiative to find creative solutions to help close the gap between the talent produced and the talent businesses need in Massachusetts.
As a significant employer in Massachusetts, Dell EMC gets the opportunity to partner with different education institutions across the country to spread interest in STEM as well as create important workforce pipelines that can lead students to future jobs within the company. One such partnership is the Dell EMC/RSA Anti-Fraud Command Center (AFCC). RSA, a Dell Technologies business, participates in the Purdue Pathmaker Program which gives students at Purdue University the opportunity to receive internships at local companies while attending school. The AFCC employs 50 Computer Science Co-Ops who are responsible for analyzing fraud trends, forensic analysis and research, and detecting phishing attacks, among other responsibilities. Additionally, the AFCC saw significant growth in 2015 and has developed into an around the clock sister operation to its main base in Israel. The Center is a win/win for Dell EMC/RSA and Purdue students; the students are getting real life work experience and Dell EMC/RSA is filling the pipeline for post graduate hires.

Businesses can choose to engage students about STEM in a multitude of ways, either in more general ways or through a specific partnership with a single school. Roundtable members are investing substantial time and energy to increase the interest, awareness and participation in STEM fields throughout Massachusetts.

### Philanthropic Partnerships
In addition to business-education partnerships, some Roundtable members also devote a significant amount of time on outreach and philanthropic efforts throughout Massachusetts. While these efforts may not be directly impacting their company, they strengthen the surrounding communities. Through channels such as matching grants and literacy education, companies are able to affect the workforce in a valuable way.

### STEM Partnerships
STEM is a common theme that Roundtable members emphasize when talking about partnerships with education institutions. Not only do business leaders want more of an emphasis on STEM, they also want it to be taught in a more hands-on manner with increased engagement from the business community. Many Roundtable members already have long standing relationships with education institutions in STEM.

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A.D. Makepeace Company’s Commitment to the Community

Developed approximately 10 years ago, the A.D. Makepeace Internship Program seeks to establish relationships with local schools, colleges and universities to provide students an opportunity to gain work experience, to apply their classroom knowledge and develop professional skills. A.D. Makepeace has designed this program to give students an opportunity to complement their formal education with career-related experience.

A.D. Makepeace currently offers internship opportunities in Office Administration, Event Planning, IT, Earth/Environmental Science, Marketing, Database Management, Finance/Accounting, Real Estate Planning & Development, Housing Planning & Development, Agriculture & Horticulture Biology, Facilities Management, Engineered Soils, Social Media, and Logistics.

There are three internship options to give students the opportunity to complement their formal education.

- Cooperative employment is experience-based learning for high school students through paid employment in curriculum related work assignments. Students usually attend school full-time one week and work full-time one week.
- Summer employment provides work experience for college students in position related to their academic major over summer breaks. This is typically a paid opportunity.
- Academic employment provides college students work experience in positions related to their academic major while the student is actively enrolled in classes and works whenever possible. This is an unpaid opportunity as most students are earning course credit.

Over the past decade the A.D. Makepeace Internship Program has secured partnerships with institutions such as UMass Dartmouth, Stonehill College, and Elon University.

In addition to the internship opportunities, A.D. Makepeace established the Makepeace Neighborhood Fund in 2005 as a way to provide support to local community groups and local schools. Grants are available to non-profit organizations and governmental agencies that provide services to residents of Wareham, Plymouth, Carver, and Rochester. In 2015, A.D. Makepeace awarded grants totaling over $45,000 to area public schools and organizations focused on education and career readiness.
AT&T's Partnership with Boston University

In March of 2015, AT&T partnered with Boston University's College of Engineering to create a 2 year engineering and technology program for the Josiah Upper Quincy School in Boston. The funding enables undergraduate Inspiration Ambassadors from the College's Technology Innovation Scholars Program (TISP) to deliver classroom and after-school engineering activities such as designing vehicles, building and coding robots, and designing wind turbines and fiber optics protocols, to name a few. TISP’s mission is to inspire and prepare a diverse workforce for 21st century technology-related fields. Each year, the program professionally trains and manages 50 select BU undergraduate engineers as "Inspiration Ambassadors," who share their passion for and understanding of technology and engineering design with youth nationwide. TISP's local programming began in September of 2015 with fifty low-income first generation 9th graders who will participate in the program through the end of their 10th grade year. AT&T’s, $145,000 contribution is part of the company’s Aspire grant fund which was launched in 2008 and has been committed to increasing high school graduation and career readiness with a particular focus on data-driven outcomes in education.

Impact of Partnership. AT&T has an extensive track record of partnering with institutions that we know are using statistically supported and measured outcomes for success. AT&T’s partnership enables TISP to hire 55 undergraduate student engineers and coaches to teach and mentor students in the classroom for a period of 2 years. Student engineers hail from diverse educational backgrounds, ethnic cultures, and geographic areas. The impact of this partnership will support TISP’s data collection, analysis and both inspire and prepare them for post-secondary success. Each student will receive pre and post baseline surveys that will measure their interest in STEM related careers and their aptitude towards graduation. After 8 visits it is evident that students have embraced TISP’s engineers as positive role models and have a renewed interest in STEM.

"This contribution will enable us to provide all the benefits of TISP engineering outreach: fun design activities, after-school robotics, and summer enrichment and scholarships and deliver our relatable role-models to a partner high school in Boston. We continue to engage students of all backgrounds and abilities and both inspire and prepare them for post-secondary success," said Dr. Gretchen Fougere.

In Boston, the Ambassadors guide students in the engineering design process as teams innovate to create technologies associated with communications, energy, the environment and healthcare. In Boston area schools, for example, these design challenges relate to cellphone towers, wind turbines, fuel cells, robotics and coding and app development. The technologies and engineering are derived from cutting-edge engineering research at BU and corporate supporters like AT&T.

By the end of June, 2016, TISP will have completed 10 visits to the Josiah Upper Quincy School with the support of AT&T. We will continue to work with TISP to monitor student progress, conduct classroom visits and promote this important partnership.

Lessons Learned from the partnership. Our partnership with Boston University’s College of Engineering has just begun although we have seen short-term outcomes and believe this investment is supporting student engagement which increases their likelihood to succeed, graduate from high school and begin their post-secondary education.

Anecdotal evidence suggests that the program has had a direct and favorable impact on underprivileged youth, influencing many to seek out STEM coursework in high school, to graduate from high school, and even to pursue and secure university placements and scholarships. Five have received full scholarships for study at BU's College of Engineering or other schools. Several of the former high school students reached and mentored are now Ambassadors themselves.

The AT&T contribution will enable the program to empirically measure and document that impact, while also providing a test case for running the program on an intensive basis with a dedicated cohort of students over two years.
Becker College’s Yunus Social Business Centre

Becker College is one of a handful of higher education institutions in the world—and the first in the United States—to establish an officially sanctioned Yunus Social Business Centre.

The Yunus Social Business Centre at Becker College complements Becker’s mission to provide a transformational learning experience to each student, and expands the global concept of education they provide. Yunus’ approach to social business is uniquely positioned to address need, create value, and drive profit which, in turn, can expand the reach, impact, and sustainability of the solution. Professor Yunus believes this approach of applying business to social problems is more scale-able and resilient than any other strategy.

Becker shares this vision and understands that students are value creators. They solve problems with an entrepreneurial mindset. The goal is to provide students with the skills to take real-world problems and create self-sustaining businesses that have social impact, create jobs, and spur economic development. The new Colleen C. Barrett Center for Global Leadership, opening next fall, will be the locus for supporting experiential and service learning to educate a new generation about the importance of social business.

Becker College is working to develop partnerships with companies such as Wilson Language Training to create a social business laboratory centered on literacy. Students and graduates in the Gaming, Design, Big Data, Global Citizenship, and Early Childhood Education programs will greatly benefit from a relationship with Wilson Language Training in the short and long term. Having them as a partner will significantly impact Becker’s experiential learning programs within the Yunus Social Business Centre at Becker College. Wilson Language Training will serve as the first social business in need of problem-solving with the goal of working toward a real-life solution presented by student-led teams.

A college degree from any institution has little value to the graduate or society if it does not fully develop students who not only have knowledge, but also know how to effectively use that knowledge in innovative ways. Today, employers seek employees—universally, in all industries—who not only execute the job for which they were hired, but also possess an agile mindset that enables them to rethink, reimagine, and reconceive the job to add new value for the employer.

The Agile Mindset

The way people work today will not be the way people work tomorrow; the career model of working in one job until retirement is a relic. So, too, is the old higher education model obsolete, whereby a student would earn a degree to prepare for a first job and a single career that would end at retirement. College graduates today will have more than 15 jobs by the age of 40. It is imperative that higher education prepares each student for multiple jobs and careers, helping them develop the soft skills that will enable them to effectively adapt to disruption and reinvent themselves throughout their professional careers. At Becker College, this is called the Agile Mindset and Becker is currently developing a partnership with companies such as Unum Insurance to create a unique program that will bring these skills, through competency based education, to their employees.

The Agile Mindset at Becker College is an approach that values knowledge and the power of learning. It provides individuals with the adaptability to complement planning and process with competencies in:

- Empathy to uncover insights and human needs in times of ambiguity.
- Divergent thinking to find, frame, and address problems not yet known.
- Entrepreneurial outlook to create value in all that they do.
- Social and emotional intelligence skills to collaborate with others to create solutions.

At a time when many colleges and universities are struggling with low enrollment, financial shortfalls, and reputation challenges, Becker College continues to thrive and transform. During this implementation phase of the Agile Mindset as part of their seven-year strategic plan, there are many new opportunities for partnership and strategic growth. The agile mindset effectively equips Becker graduates to embrace jobs that do not yet exist, to solve problems that have yet to be identified, and to weather the disruption that lies ahead.
Procter & Gamble Partners with Benjamin Franklin Institute of Technology to Prepare Students as Technicians and Leaders through Summer Co-op Program

P&G has partnered with Benjamin Franklin Institute of Technology (BFIT), a private non-profit college in Boston, in an effort to increase the manufacturer’s pipeline of skilled plant technicians. As part of P&G’s summer co-op program, four BFIT students served as full-time plant technicians, gaining invaluable job exposure and training, while supporting P&G’s manufacturing needs.

These BFIT students are part of P&G’s effort to train plant technicians and cultivate future industry leaders. “All of our technicians are learning to become quality control managers,” said Aravind Menon, P&G’s senior HR manager. “Technical expertise is important, but soft skills such as leadership, teamwork, and communications are even more important. That’s why we partnered with the college. We are trying to develop the whole person.”

Co-op students have worked hands-on in one of the most technology-advanced manufacturing facilities in the world. As an example, one intern learned to troubleshoot and operate a Cartridge Assembly Machine, which takes all the components, and through continuous motion, assembles them into cartridges. “BFIT’s manufacturing classes and machining helped a lot. CAD was a big one. It helped me understand how these parts are designed and assembled, and how it all works,” said Dylan Foureau, a Mechanical Engineering Technology student.

The co-op has enabled students to extend their learning into a professional work environment, and hone their soft skills such as communication, goal-setting, problem solving, and collaboration. P&G’s management philosophy closely aligns with the college’s approach to higher education. In addition to the hands-on technical training, the college’s general education courses prepare students with soft-skills that employers demand in today’s job candidates.

For BFIT students, the co-op has meant earning good pay and securing good references for future jobs. It has also given students a sense of responsibility and trust. “Before coming to BFIT, I kept getting low-paying jobs. I was going about it the wrong way. I knew I needed specialized skills to get a better paying job and to move up in my career,” said Ludwig Jean, a senior in BFIT’s Mechanical Engineering Technology Associate Degree program.

P&G’s selection process for this program is rigorous. In addition to a thorough application and a GPA requirement, candidates must complete an in-depth reasoning test and two rounds of in-person interviews with P&G managers. This process prepares students for the rigors they will surely face when entering the workforce, though P&G’s open communication throughout has enabled BFIT to help coordinate placements and maximize student access to this opportunity.

In its first year of inception, P&G and BFIT are both benefiting from this collaborative relationship. Built into the co-op are a mid-point check-in and a final presentation, both of which provide a forum to share insight about skills essential to success in the classroom and workplace. Collaborative exchanges, such as this, enable BFIT to align its curriculum to meet industry needs. BFIT hopes to continue serving as a workforce pipeline for P&G and other leading manufacturers. This partnership is part of BFIT’s overarching effort to gain input from industry to ensure that the college teaches students the right blend of technical and workplace skills.

"A strong pipeline of highly-skilled and talented plant technicians is critical to the long-term health of our world class manufacturing capability in Boston. We value the partnership with BFIT to ensure we have the right people to continue to improve our manufacturing capability to serve consumers better than anyone else in the world."

Mike Chaney, VP Global Shave Care
Beth Israel Deaconess Medical Center Partnership with Bunker Hill Community College

To address shortages in key positions, Beth Israel Deaconess Medical Center (BIDMC), a CareGroup member, has developed programs to train current employees for these roles. To date, pipeline programs focused on ten different occupations have been launched, helping over 100 workers move into new jobs and increase their lifetime earnings potential.

In the process of offering college-level training opportunities for employees, it became clear that many BIDMC employees were not quite ready to pursue college-level work. In 2007, in partnership with Bunker Hill Community College, BIDMC launched its Employee Career Initiative (ECI), which offers employees:

- free pre-college courses in reading, math and English on-site at BIDMC;
- free college-level science courses that are key pre-requisites for allied health careers;
- one-on-one college and career counseling; and
- free tutoring from volunteer BIDMC employees.

BIDMC designed this program to help more employees acquire the basic skills they need to grow their careers and fill important roles within the institution. The program has also greatly increased the number of employees eligible for BIDMC internal pipeline programs.

With almost 10 years of experience running the ECI, BIDMC has learned that the following are essential for a successful partnership:

- Because this program is employer-led, BIDMC was able to work with the college to design the program and make course corrections in a manner that would best serve BIDMC employees.
- The college placement test can be a significant barrier to adult learners looking to attain a college degree or credential. Offering a convenient, no-cost opportunity to take pre-college courses removes that barrier for BIDMC employees.
- Many employees take an ECI course after applying for a pipeline program and learning that their skills are not where they need to be for a promotional opportunity. By more directly connecting skill development to promotional opportunities, we have been successful in attracting employees to these courses.
- BIDMC closely monitors student performance by offering intrusive advising—checking in with employees when attendance or grades slip, and offering support. This is why employees' pass rates are so high.
- BIDMC is a large institution. Having a person who any employee can go to for career and academic support is great for employee retention, development and engagement.
- Innovative ideas sometimes need seed money to start. A grant from The Boston Foundation got this program off the ground, and sustained it for nine years.

BIDMC has, to date, more than 1,100 employees have participated in this program with an impressive course pass rate of 90 percent. This program has been an excellent way to support BIDMC’s employees in taking the first step toward a college degree, a certificate program, or one of BIDMC’s internal promotional opportunities. The ECI has become the gateway to all of the career development services available to BIDMC employees.
Blue Cross Blue Shield’s Collaboration with Boston Public High Schools

In 2000, Blue Cross Blue Shield of Massachusetts, in partnership with community, business leaders and educators, identified improving the education of youth as a priority for the Commonwealth. The challenge is as compelling now as it was 15 years ago. According to the 2015 Massachusetts Comprehensive Assessment System (MCAS) state results, nearly 40% percent of students failed to meet federal achievement standards. As a result, Blue Cross continues its ongoing dialogue and partnerships to help strengthen the schools.

Blue Cross has a significant partnership with the Private Industry Council (PIC) and the Mayor’s Summer Jobs Campaign to provide summer employment to Boston public high school students. This program helps businesses develop the workforce they need and helps Boston area students gain access to career opportunities and higher incomes. In 2014, the Company employed 120 high school interns. Working with its network of community partners, 91 of these students were placed at nonprofit organizations throughout Boston, which helped to build capacity and get the important work of these organizations completed during the summer months. Early Investors Financial Literacy classes were also provided to the students as part of the program.

Early work experience is a critical factor in determining future success. Students who gain work experience during high school enjoy higher employment rates and earnings later in life. Additionally, these students stay in school, graduate from high school, and enroll in college at higher rates than do their peers. These benefits compound over a lifetime.

The summer job market for teens in both Massachusetts and the U.S. over the past five years has been quite depressed, with record low summer employment rates for the nation’s teens being set in the recent years (2010-2012). Black and Hispanic teens, especially those residing in low income families and from high poverty neighborhoods, have experienced the greatest difficulties in finding employment in the summer. Lack of job opportunities reduces teens’ exposure to the world of work and their ability to acquire both basic employability skills (attendance, team work, communicating with other workers and customers) and occupational skills. Being jobless all summer also increases their risk of social isolation (staying at home), hanging out on the street, and exposure to or participation in urban violence and delinquent behavior. Research findings indicate that meaningful employment opportunities can help reduce violent, risky, and adverse social behaviors among economically disadvantaged youth from Boston’s high crime neighborhoods during the summer months and prepare them for future employment and academic experiences.1

One of the biggest lessons learned from Blue Cross’s partnerships has been around accommodating various levels of experiences of high school students in a corporate setting. Blue Cross used a couple of approaches to leverage the various degrees of experiences for a truly win/win opportunity for all parties—by identifying specific needs in various business areas to place the students (for example, for data centers and building moves, many students are placed in IT), and partnering with community partners to place the students at those organizations to build capability and nonprofit work understanding for the students and to build capacity at the organization for their important work. The partnership with PIC and the Mayor’s Summer Jobs Campaign paves the way for Blue Cross to provide meaningful summer employment to those who need it most.

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1 The Summer Employment Experiences and the Personal/ Social Behaviors of YVP Employment Program Participants and Those of a Comparison Group (Executive Summary)
Comcast’s Workforce Pipeline with Madison Park Vocational Technical High School

Comcast has a 20-year community partnership with the Madison Park Vocational Technical High School in Roxbury, MA providing internship opportunities with Comcast’s technical operations group. Comcast’s Boston office employs over 200 individuals, the majority of which work in technical positions that maintain the Comcast network, construct infrastructure, and install and service products in the field. It is in the best interest of Comcast to hire highly skilled employees that represent and understand the communities in which they work. Madison Park Vocational Technical High School’s mission is to provide the area’s diverse population with the opportunity to acquire an integrated vocational and academic education. Individualized instruction, applied learning and work site experience prepare all students to succeed in technologically advanced careers and post-secondary education.

Through the years, the partnership has provided work site experience to a group of students in which they spend two weeks per month (up to 80 hours) in paid technical intern positions. Annually, Comcast selects 6 students in their senior year of study who are offered positions that are scheduled 20 to 40 hours per week, two weeks per month, February through Madison Park’s graduation in May.

This partnership has enhanced the leadership skills of the high potential technical employees in Boston in addition to generating a number of employable candidates for technical positions within Comcast. In many instances, Comcast has been fortunate to hire students upon graduation. One such example Helio Martinez, one of Comcast’s best supervisors, is a graduate of Madison Park and a former intern within this program. In total, 12 Madison Park graduates have been hired by Comcast following their participation in this program.

Through many years of operating a successful internship program with a vocational tech high school, Comcast has learned that the following elements are required:

- Engaging internship administration at the school location with the ability to identify appropriate candidates, monitor the students throughout the internship experience and assist with employee clearance and onboarding processes
- Building and maintaining strong relationships between the school’s internship administrator, the business’s local team leader and the business’s local human resources staff
- Maintaining close geographic proximity between work and home, available public transportation, or a transportation plan
- Having an experienced and invested local team leader

By creating such a direct workforce pipeline through the Madison Park program, it gives students post-graduate job opportunities while supplying Comcast with the employees that it needs. It’s a win-win for Comcast and the community.
At Consigli Construction Co., Inc., we know that great people are where great building begins. And to assure that our industry continues to build the places that support our communities, we know how important building and mentoring the future workforce is.

From our partnerships with school-based educational programs, to our in-house internship programs for students, and educational programming that provides our staff with ongoing learning, we use a blended learning approach to build great people.

We pride ourselves on being at the forefront of innovation across our entire company and the learning management software our staff uses to receive training at their own pace is an example of that.

Additionally, every April and October the company hosts the Consigli Learning Conference, where employees learn from key thought leaders in the construction field. We also offer training programs throughout the year at the Consigli Construction University, a state-of-the-art educational space in our company headquarters.

The successful Consigli Summer Intern program and year round co-op programs with local institutions Worcester Polytechnic Institute and Wentworth Institute of Technology offer students real-life experiences working in our industry as well as a pipeline of talented young professionals for our company to hire.

We also strive to play a significant role in the community as well. Founded in 2001, the Consigli Foundation focuses on the health, education and well-being of disadvantaged children by contributing to the cities and towns that our company serves. Through the foundation, we have been able to support key programs that educate younger students so that they may find opportunities in our industry one day.

Recently, the foundation sponsored the Massachusetts-based non-profit Science from Scientists program at the Burncoat Street Preparatory School in Worcester.

Science from Scientists has worked closely with teachers, students, administrators and legislators to address the specific needs of various school systems regarding the ongoing STEM challenge. The donation supports the organization’s core During-School STEM Enrichment Program at the Burncoat featuring exciting hands-on lessons taught by real, charismatic scientists.

Additionally, Consigli has consistently been involved with the ACE (Architecture; Construction; Engineering) Mentor Program, offering both financial support and skilled staff mentors. This year, more than 10 Consigli employees will once again serve as mentors to dozens of area high school students who will learn about the architectural, construction and engineering industries from them directly.

We also participated in ACE’s trade day at Madison Park Technical Vocational High School and the organization’s trip to the ABX Conference in Boston as well as several tours of working project sites in the area.

Education at all levels has been and will continue to be a cornerstone of Consigli’s success.
Ernst & Young’s College MAP (Mentoring for Access and Persistence) Program

College MAP (Mentoring for Access and Persistence), EY’s signature volunteer program in education, is a long-term, group-mentoring program focused on empowering students in area underserved high schools, so that they can gain access to college and succeed in higher education. College MAP (CMAP) matches EY volunteer mentors of all levels, backgrounds and service lines, with groups of 11th and 12th graders at local high schools.

EY teams with College for Every Student, a national not-for-profit that is an expert on helping underserved students gain access to higher education, to develop our curriculum. The College MAP program is designed to help to demystify the process of applying to and affording college, encouraging students who might not have otherwise considered applying for college.

To date, over 1100 EY professionals have worked with high school students to help build the skills to persist in completing their post-secondary goals. Skills such as: Awareness of the lifelong benefits of earning a higher education; Financial readiness that helps students apply for aid and pay for college; Persistence skills to help students complete and succeed in careers; and Self-efficacy skills to help students overcome obstacles, achieve milestones and become more successful, contributing members of society.

More than 95 percent of students participating in CMAP have graduated high school in comparison to 72 percent of their relevant peer group. This is 14 percent above the national average. Approximately 90 percent of students graduated pursued higher education and 5 percent enrolled in trade/vocation schools or joined the army.

In the Boston community, EY has strongly supported two prominently underserved high schools, Boston English and Madison Park Technical. 50 EY employees are currently serving as mentors.

Impact of the Boston area College Map 2016 Class:

- 26 seniors graduated from the program with 23 enrolled in college or a postsecondary education.
- 7 students received over $23,000 in college scholarships in 2016.
- Colleges attending include: Bridgewater State University, Salem State University, New England Culinary Institute, Pine Manor College, Johnson and Wales University, Bunker Hill Community College, and Mount Ida College.
- CMAP Scholar was accepted into the Foundation Year program at Northeastern University.
- CMAP Scholar received a MLK Scholarship at the 46th Annual Rev. Dr. Martin Luther King, Jr. Memorial Breakfast in Boston.

At Boston English High School, CMAP compliments and furthers the school’s Technical Pathways Program (TPP), which provides curriculum to help prepare students for careers or college in several disciplines including Business, Finance & Entrepreneurship. A local EY professional serves on the TPP board as a representative to provide insight and leadership. EY also provides a summer internship to a student in the program, which benefits the individual, the school and EY, while supporting the City of Boston’s Youth Employment Program.

The CMAP program provides each student with multiple mentors, allows EY professionals to balance work and long-term mentoring commitments, and creates a supportive and encouraging community amongst the students participating in the program.

In addition to the thousands of volunteer hours providing mentorship, a scholarship fund has been established to support the financial obligation of higher education to select program participants. From 2013 to 2015, over $1 million dollars has been awarded across the country with almost $100,000 given to students participating from the Boston program.
Eversource’s Electric Power Utility Program

In 2004 Eversource, Bunker Hill Community College and the Utility Workers Union of America Local 369 worked together to launch the Electric Power Utility Program (EPUT). This accredited two-year academic, technical and on-site training experience provides opportunities to a diverse student body—from young men and women who recently graduated high school, to individuals refocusing their careers, including veterans. The program has become highly competitive and selective with well over 200 applicants each year for 18 positions. In addition to the wide variety of courses taken at Bunker Hill Community College, students gain hands-on experience through weekly labs and paid internships at Eversource. Upon successful completion of the program, students are encouraged to apply for positions at the company.

EPUT stands out as one of the most successful and highly effective community college programs in Massachusetts:

- Over 189 students have enrolled in the program since 2004 and over 90% of the graduates have been selected for careers with Eversource;
- Of those hired, 95% are still employed in key operational roles working to safely deliver reliable energy and superior service to customers;
- 82% of the students in this program graduate within two years. This is considerably higher than the overall community college three-year graduation rate; and
- Some of the students have continued to pursue bachelor’s degrees and have been successful in engineering positions.

Eversource attributes the program's success to several factors:

- The ongoing business need for diverse, capable talent to fill employee pipelines for the future;
- The commitment to the program of senior management and union leadership, especially in terms of leadership, and financial and human resources support;
- Quality resources fully dedicated to the students and the program. These include specialized program trainers and outstanding supervisors and employees who are selected to work with students;
- Academic standards the students are required to meet such as GPA in certain courses, class attendance, and successful on-the-job evaluations from Eversource supervisors and instructors;
- Managers compete for graduates to join their teams during the interview and selection process;
- The minimal program cost for the students. While they work on site, Eversource pays the students approximately $12.00-$13.00 per hour and contributes an additional $2.00-$3.00 per hour towards the students' tuition costs (making the tuition essentially no cost to the students); and
- Cohesive structure of the program—students attend classes and work together which provides a sense of teamwork, friendship and support.

Originally geared specifically toward overhead line work, the EPUT has evolved in alignment with Eversource's business need to include more disciplines such as underground line work, substation operations and other general utility roles.

The program has also recently expanded to include training on the natural gas system, a program component facilitated with the help of Eversource gas employees and members of the United Steelworkers Local 12004. Integration of these disciplines enables the graduates to become better rounded, highly qualified, and sought-after candidates for employment at Eversource.
General Dynamics Mission Systems Commitment to STEM Outreach

General Dynamics Mission Systems is dedicated to STEM outreach. General Dynamics Mission Systems has locations all across the country that partner with local schools in their area. In Pittsfield, Massachusetts, the partnership the General Dynamics Mission Systems facility has with local educational institutions is strong and being strengthened by continued outreach. This partnership benefits both the educational institutions as well as General Dynamics Mission Systems by engaging students in STEM fields of study and encouraging them to continue pursuing STEM career paths.

General Dynamics Mission Systems in Pittsfield, MA reaches out to schools and educational programs alike. It works with local elementary, middle, and high schools, colleges, afterschool programs and non-profit organizations like the Berkshire United Way, Girls Inc., The Boys and Girls Club and Boy and Girl Scouts of America to design educational projects, visit classrooms, offering engineering and robotics challenges, and opening the facility for lab tours and one-on-one mentoring.

General Dynamics uses National Engineer’s Week as a platform to promote STEM educational fields and career paths by inviting local groups into the facility and providing special tours. The General Dynamics tour shows students how engineering principles can be executed for real life applications and how being an engineer or scientist can positively impact people and also help our nation. During this week college level students visit General Dynamics Mission Systems for special tours and conduct a resume building workshop helping to prepare them for entering the workforce upon graduation.

General Dynamics Mission Systems also organizes several events outside of Engineer’s Week. Introduce a Girl to Engineering Day is an event where General Dynamics Mission Systems female engineers head to the local Girl’s Inc. and teach a few lessons on engineering, and The High School Engineering Design Competition is an event held annually where General Dynamics invites local high schools from around Berkshire County to participate in a real world engineering design.

Many local high schools have approached General Dynamics Mission Systems for help in developing Introduction to Engineering as elective courses. At the college level General Dynamics Mission Systems participates in a variety of activities, with many local schools from both Massachusetts and the Capital Region in New York including: UMass Amherst, Lowell, Dartmouth, and Boston, Mass College of Liberal Arts (MCLA), Berkshire Community College, Williams College, Western New England University (WNEU), Worcester Polytechnic Institute (WPI), Rensselaer Polytechnic Institute (RPI), and Union College, among others.

General Dynamics Mission Systems recruits from these educational establishments, but they do much more than just hire students. Specifically, with MCLA General Dynamics Mission Systems has been working to help shape their curriculum for a new Software Engineering Program. General Dynamics Mission Systems tries to engage with these universities on more than just a recruitment level and want to get to know their faculty and students and build working relationship that benefit both organizations.

By partnering with local educational organizations both General Dynamics Mission Systems and the schools benefit. The students are exposed to new ideas, concepts, and career paths and General Dynamics Mission Systems helps plant the seed for them to enter into STEM careers and potentially come work for the company. If General Dynamics Mission Systems engages students at the right age—and reinforces that involvement throughout their school years—the students develop an interest and passion for the sciences and want to continue to grow their knowledge in this area. Not all schools have the funding to provide engineering related classes and many students in the state might never be introduced to this huge career field. If General Dynamics Mission Systems can strike a passion in students they can be more likely to return home after their higher education and bring their knowledge back to the community and possibly General Dynamics Mission Systems.
Harvard Pilgrim’s Set Sail for Success Program

Harvard Pilgrim’s Set Sail for Success program is a novel, public-private partnership designed to improve graduation rates among students in the College of Nursing and Health Sciences at the University of Massachusetts Boston. It is funded with a five-year, $500,000 commitment from Harvard Pilgrim Health Care to the university.

An analysis of student success data at the university reveals that students who make it through the crucial first year are far more likely to graduate than students who do not, and keeping students in school is a priority at the university. Set Sail for Success aims to provide nursing and health sciences students with the support they need to get them to graduation.

The program launched in September of 2014 with an initial cohort of 20 freshmen students. It has grown every year so that for the academic year 2016-2017, 60 freshmen are enrolled and a total of 110 have been served. Students are provided with intensive, personalized advising and support. They benefit from a Harvard Pilgrim Guest Lecture Series and mentorships. The lectures, which are given by Harvard Pilgrim employees, focus on important health and leadership issues. The students are also invited to Harvard Pilgrim events throughout the year.

At the core of the program is creation of a learning community for these students. Each of them is provided with support from a paid staff advisor and equipped with a tablet preloaded with software designed to facilitate their orientation to the university. Special software will help improve writing skills and study habits along with chat and instant message features to help students connect to each other as they work on course projects. The students also take a special, one-credit course to help them successfully make the transition to college.

Set Sail for Success is a “hands on” program for Harvard Pilgrim and its employees. Through the Guest Lecture Series, invitations to Harvard Pilgrim events and functions and the mentoring component, the UMass Boston students will become part of the Harvard Pilgrim community.

Lectures in the first year include topics such as:

- Changing Roles and Opportunities for Nurses;
- How the Affordable Care Act is Impacting the Health Care Landscape; and
- Understanding and Improving Your Personal Brand.

The success of this program will be tracked and reported as results become available. Set Sail for Success is about enhancing the success of future nurses and health care professionals and helping Massachusetts prepare to fill the critical need for nurses in both clinical and non-clinical settings in the marketplace.

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IBM's Commitment to Education

As one of the leading technology corporations in the world, IBM depends on a talented future workforce to have continued success. Nothing is more fundamental to economic growth than building 21-century skills for all students. IBM's longstanding commitment to education has evolved over the years to anticipate the needs of a changing world. Service and volunteering have always been essential elements of what it means to be an IBMer. As a result, IBM has been participating in business-education partnerships throughout its history. In Massachusetts IBM is proudest of its long lasting collaborations with Boston Latin Academy and with Cambridge Public Schools. Both of these long standing relationships emphasize STEM and career exploration, in alignment with IBM's commitment to education.

IBM and Boston Latin Academy School Partnership

Boston Latin Academy is one of three public examination schools in Boston providing students in grades 7th through 12th grade with a rigorous classical preparatory education. The school partnership formed between IBM and Boston Latin Academy 40 years ago has endured, with activities supported by the Boston Private Industry Council engaging hundreds of students each year emphasizing college and career readiness and academic achievement.

- **Mock Interview Workshop:** Over the course of a two-day workshop IBM volunteers offer the entire junior class of approximately 300 student advice on resume building, college and career interview preparation and techniques, as well as career and internship guidance.
- **Job Shadow Day:** Each Spring IBM hosts a group of Boston Latin Academy juniors at their Cambridge office where the students are paired with an IBM employee and spend the day engaged in job shadowing in a STEM field.
- **Honor Roll Luncheon:** As a way to recognize students who excelled by making the honor roll during the entire academic year, IBM hosts an honor roll lunch for over 300 students onsite at Boston Latin Academy, recognizing each student with a certificate of achievement.

IBM MentorPlace in the Cambridge Public Schools

IBM MentorPlace is an online mentoring program that links the knowledge, dedication, and enthusiasm of teachers and students with the talent, skills and volunteering spirit of IBM employees. In over 35 countries, more than 6,000 IBM employees are providing academic assistance and career guidance to over 7,000 students. MentorPlace provides a real-world framework to support employee volunteerism, and connects IBM mentors to students using online activities that correspond directly to their classroom learning.

- For over 20 years, in collaboration the Cambridge Public Schools and Cambridge School Volunteers, IBM has provided mentors for hundreds of middle school students.
- IBM mentors and students work together on projects such as writing a mentor biography project demonstrating choices leading to career paths while emphasizing writing skills.
- IBM supports the City of Cambridge's goal to provide a STEM mentor for every Cambridge 7th grade student, and invites other companies to join in this effort.

IBM is proud of the partnerships they have been able to maintain with Boston Latin Academy and Cambridge Public Schools. Part of what makes these enduring partnerships successful is the strong and open communication between the schools and IBM, and the commitment to adapting programs to meet the changing needs of the students and schools. In addition, the programs benefit from strong leadership where experienced volunteers are offered the opportunity to develop their leadership and organizational skills by serving as program coordinators. IBM takes pride in its partnerships with local schools and is proud of the work that its employees do to excite Massachusetts' future workforce in STEM related fields.
iRobot’s Commitment to the Future of STEM Education

iRobot is committed to building a future for Science, Technology, Engineering and Math (STEM) education in the United States. Their multi-faceted outreach program is a resource for students, parents and educators to share in the excitement for the robotics industry and get an inside look at iRobot.

In addition to classroom visits and other events, iRobot provides mentoring, career introduction and internships, all geared toward connecting students to the opportunities provided by a STEM education and occupation.

With an iRobot benefit of two STEM days per year, employees are encouraged and enabled to volunteer for the STEM program. In 2015 over 50% of iRobot employees participated in the STEM program, sharing their enthusiasm and passion for robotics with students and aspiring engineers. These visits, events and other STEM assets are coordinated by the iRobot STEM team. iRobot is one of the few tech companies with dedicated staff for STEM education. The STEM Program Manager is devoted to cultivating the STEM program and providing resources for the volunteers. Throughout the year, iRobot welcomes over 2,000 visitors to come to its facilities to learn about iRobot’s history and STEM efforts. These groups see the various ways iRobot has been evolving over the year, and learn about what it takes to be an engineer with different programs designed for different groups:

- **iRobot’s Cool Stuff Room:** Visitors get a tour of the museum which displays some of iRobot’s most impressive robots while also highlighting the importance and fun of STEM.

- **Family Innovation Room:** This area allows employees, their families, and students to learn hands on skills like 3D printing, soldering, and programming.

- **Job Shadow Program:** Offered to older students, the iRobot job shadowing program allows students to meet with engineers with a wide variety of disciplines which helps students make informed career decisions as well as showcasing how disciplines work together on team projects.

iRobot volunteers have met over 78,000 students, teachers and parents in classrooms and at events yearly to share excitement for STEM education. Over 300 classrooms and STEM events are attended annually by iRobot employee volunteers. By visiting classes and educational groups from Pre-K through college, iRobot is able to tailor their program to meet the audience, and inspire each age to see just how amazing robotics and STEM can be. iRobot’s staff and robots have attended events around the country, both physically and virtually. By using remote presence robots, they are able to connect with classrooms and interact with students without leaving the building.

To fully immerse students in STEM and robotics, iRobot has introduced the iRobot Create®2 Programmable Robot. Create 2 is an affordable, ready to go, mobile robot platform for educators, students and developers. Used to grasp the fundamentals of robotics, computer science and engineering, it lets the user program behaviors, sounds and movements as well as build onto the robot itself. With the recent introduction of Scratch + Create 2, the robot now enables students as young as elementary school to send it commands and see the physical object react. Scratch is a visual programming language developed by MIT and used in many schools as the first step in coding and programming.

On a broader scale, iRobot is the founder and lead organizer for National Robotics Week. Established by Congressional resolution in 2009, Robotics Week is held the second week of April each year. Now in its seventh year, National Robotics Week boasts over 250 events occurring across all 50 of the United States.

Since 1990, iRobot has been building and designing some of the world’s most important robots. With two decades of leadership in the robot industry, iRobot remains committed to not only building robots that improve the quality of life worldwide, but building a future for Science, Technology, Engineering and Math in the United States.
MassDevelopment’s AMP it up! Program

MassDevelopment has worked with numerous community colleges and vocational schools and their partners in the four rounds of the matching grant program. The Agency provides funds to a lead organization, which works with career centers, schools, manufacturers, and other local and regional organizations to reach students and adults. This year, schools leading their partnerships are Berkshire Community College, Cape Cod Community College, Quinsigamond Community College, and Shawsheen Valley Regional Vocational School District. Schools partnering with other grantees, such as workforce investment boards, include Greenfield Community College, Greater Lowell Technical High School, University of Massachusetts Lowell, and Mount Wachusett Community College. Programs range from billboard advertising and company tours to internships, job shadowing, mentoring, and “Tech Jam 2016,” which will feature hands-on demonstrations and interactive workshops for more than 100 middle school students.

Grantees submit a final report that details their activities and how many students and adults their programs reached. In 2015, the grantees’ reports highlighted that:

- There were 114 events that reached nearly 6,500 students and adults; and
- About 76 percent of the events came from partnerships that involved vocational schools and higher education institutions.

In addition to the matching grants, AMP it up! ran its second video challenge, which asked students to make a three-minute video that showcases a Massachusetts manufacturing innovation and what it means to the general public. Students were eligible to win prize money for their schools. Students submitted 13 videos that generated 4,800 online votes. Durfee High School won $5,000 for its videos about Blount Fine Foods and H&S Tool, and other awards went to Melrose High School, which profiled the Avedis Zildjian Company, and Seven Hills Charter Public School, which highlighted the Warner Babcock Institute for Green Chemistry.

As evidenced by the numbers, vocational schools and community colleges have been critical in spreading the message that manufacturing is a viable, high-tech career path. Students around the Commonwealth are taking notice: a recent Northeastern University study of career and vocational technical education, which MassDevelopment sponsored along with the Massachusetts Business Roundtable and other organizations, found that more than one-third of these schools have waiting lists, especially in Gateway Cities. What MassDevelopment has found is that creating awareness of manufacturing careers may be most effective in middle school, as students often have made decisions by the time they reach high school or community colleges. Fortunately, the educational institutions in the AMP it up! matching grant program have opened their doors specifically to middle schools across the Commonwealth, displaying their double value in training future manufacturing employees.
MassTech Partnership with the New England Venture Capital Association and TechGen

The Massachusetts Technology Collaborative (MassTech) has partnered with the New England Venture Capital Association (NEVCA) to sponsor TechGen, a multi-faceted platform to build year-round community and engagement between tech startups and companies and the large college student population across Massachusetts.

Formally launched in February 2015, TechGen excites undergraduate and graduate students from Massachusetts colleges and universities about the region's tech sector and connects them to each other and with local technology startups and companies through community building events, dynamic career programming, a content-rich newsletter, and a web-platform with an internship matching function. TechGen serves to address the ongoing need recognized by the Innovation Institute and its stakeholders of better capturing and retaining the flow of students who come to study at the region's colleges and universities and channeling them into the state's available skilled labor pool.

TechGen is a public-private partnership. MassTech's sponsorship enables the development and implementation of community building programming for students and tech startups and growing companies. NEVCA supports the creation and continuous improvement of the TechGen web platform.

TechGen is a program of NEVCA that MassTech sponsors as one way to concretely respond to industry calls for the Commonwealth to do more to better attract and retain the best young talent for the growing tech sector. The TechGen platform has intersected with and leveraged the support of other MassTech activities, most notably, the MassTech Intern Partnership stipend program. Specifically, for summer 2016 TechGen has been complementary to the MassTech Intern Partnership by advertising the availability of stipends to eligible companies; offering programming and networking opportunities to participating students; and providing an interactive web platform to facilitate company and student internship matching.

Since the beginning of 2015, TechGen has engaged more than 4,200 students and more than 325 local companies. Successes from the first pilot year include 782 students and 117 companies registering through the TechGen web portal (representing 440 internship openings) as well as 669 students participating in summer programming, including tech treks, fire-side chats, intern-company speed dating, celebratory summer picnics and more. In its second spring season, the TechGen platform had more than 1,800 students actively searching for summer internships, and the platform processed more than 10,000 internship applications.

At the end of the summer of 2016, the TechGen survey of participating companies revealed: 94% are likely to participate in TechGen again and 98% are likely to hire interns again. Of the students surveyed: 93% would recommend a startup or tech internship, 90% would recommend TechGen to a friend, 83% are likely to seek a career in Massachusetts after graduation, and 74% said they are more likely to look for jobs and start their careers in Massachusetts after participating in TechGen. One hundred percent of companies would recommend TechGen to another employer. Now in its second year of operation, TechGen has experienced increased traction among its targeted community of students and early- and late-stage tech companies.

MassTech and NEVCA have a successful partnership with TechGen. The success stems from a mutually shared ambition to support a stronger talent pipeline for the Massachusetts tech sector. Additionally, from MassTech's perspective, TechGen built in opportunities from the very start to take-in feedback from its targeted community of students and tech companies to ensure that the services and program were responding to their current demands and concerns. MassTech could have confidence that its sponsorship of TechGen was serving unmet needs in the community.
MITRE and Worcester Polytechnic Institute: People in Partnership

As a not-for-profit operator of Federally Funded Research and Development Centers (FFRDCs) for the U.S. government, The MITRE Corporation's mission is to serve the public interest through technical excellence and partnership. In order to address the problems of the present and future, MITRE endeavors to bring expertise to bear from academia and to cultivate a pipeline of highly skilled students.

Worcester Polytechnic Institute (WPI), an internationally-renowned engineering school whose approach to education is through project-based learning, and MITRE have been collaborating across a broad set of challenging engineering problems for decades. The level of engagement has increased significantly since 2012 when MITRE and WPI established an undergraduate project center.

WPI and MITRE's research collaborations yield creative solutions to some of the U.S. government's current problems while helping faculty and staff shape curriculum that better prepares WPI students for the workforce for the future. At the same time, collaborative project experiences help MITRE to identify, evaluate, and recruit top students while providing them with opportunities to make real-world impact.

Direct project collaboration has been the foundation of the MITRE-WPI relationship since 2012. Over that time, they have collaborated on over 15 projects ranging from topics of power simulation for electronics security, to advanced architectures for ground-penetrating radar, to cryptographic protocol analysis. In addition to undergraduate projects, MITRE and WPI have worked together to develop a novel program for sponsored graduate research which has yielded some excellent work and highly skilled new hires. Results from WPI collaborations have delivered solutions still used by sponsors and, in some instances, saved the government significant time and money.

Recent WPI-MITRE collaborations have helped to increase the number of high-quality new hires, but WPI alumni have a long tradition of high-impact roles at MITRE. Alumni are represented within MITRE staff at every level, from interns to the CEO. This partnership further prepares WPI alumni for MITRE's culture of technical excellence, collaboration, and service in the public interest. Post-graduation, MITRE provides WPI graduates a creative outlet to develop professional skills and deliver meaningful solutions toward a better world. WPI alumni at MITRE ultimately serve to advance the goals and bolster the reputations of both institutions.

There are several contributing factors to the success of the MITRE-WPI partnership including:

- MITRE and WPI sharing a culture that values thoughtful application of technology to achieve lasting impact. They both seek pragmatic solutions that consider the proposed technology in the context of human factors;
- MITRE's goal of bringing the best and brightest minds to bear on problems of national importance is satisfied by WPI's goal of increased positive impact through corporate engagement; and
- MITRE's Bedford campus and WPI being in close proximity to each other allows for frequent face-to-face meetings.

To bring the partnership even closer, WPI and MITRE are launching an initiative entitled "The MITRE Collaboratory @ WPI" which is an innovative space on WPI's campus designed to foster collaboration. This space will feature configurable enclaves that can be used for lab space, VTCs, brainstorming, independent work, and other meetings between MITRE and WPI representatives.

Through the decades, MITRE and WPI have built a relationship on mutual trust, respect, and admiration. As they look ahead, MITRE is excited to continue their long tradition of partnership to bring the best minds and resources to bear on the government's most challenging problems.
National Grid’s Engineering Pipeline Program

Fewer students are becoming engineers despite the importance of engineers in today’s society. National Grid uses engineers for a variety of reasons including understanding how to be more energy efficient, discovering how to reduce their energy use and determining where energy will come from in the next century.

Put simply, National Grid depends on engineers as creative problem solvers who help shape the future. They look to the younger generation to become engineers and a part of their future workforce.

National Grid’s Engineering Pipeline Program offers high school and college students the chance to learn more about National Grid and the engineering profession as a whole through a structured six-year program. It’s a chance for students to translate their interest in science, technology, engineering or mathematics into a future career of their choice.

As members of the Pipeline program, students are given the opportunity to gain exposure to the engineering industry through instruction, in and out of the classroom; site visits; research and projects. Highlights include opportunities for paid internships, real life engineers as mentors, with job shadowing to experience a “day in the life of”, networking with fellow program participants and even the chance to advise younger members of the program as they move throughout the program. The end result could be a future career with National Grid once they graduate from college.

National Grid’s Engineering Pipeline Program sets a student apart from the crowd. As a Pipeline Scholar, they will begin to cultivate their own talent for a future career in engineering before they even leave high school.

- **Year one** is just the first step in identifying high school students as credible talent in the eyes of colleges and future employers. Students will have the opportunity to participate in a one-week summer “Intro to Engineering Academy”. This is a valuable opportunity to meet National Grid employees and network with other accomplished students.

- **Year two** happens the summer before the student’s freshman year of college. Students will participate in a more comprehensive summer “Future of Engineering Academy” where they learn about the challenges the energy industry faces and what skills students will need to be successful in the industry.

- **Year three** allows students to compete for a select number of National Grid Summer Internships, which is a paid position.

- **Year four** allows students to again apply for a summer internship at National Grid where students work on real projects. Returning pipeline scholars have the option to continue in the same department or rotate to another department to gain full exposure.

- **Year five** allows students to utilize their National Grid network for advice on post-graduate opportunities. Additionally, now that students have completed four full years of the Engineering Pipeline Program, they now serve as mentors to younger students in the program.

- **Year six** is the final year of the program when students get ready to graduate from college. They leave the program knowing that they have valuable work experience that sets them apart from other engineering graduates. Additionally, students graduate from this program knowing that there is a possibility for a future career at National Grid.

The Engineering Pipeline Program is a great way to jumpstart a student’s future career while they are in high school and college. The program offers students a first-hand look at current and future challenges in the energy industry, technology and innovation, and the vital role of engineers. Even if students are not sure if they want to be an engineer, this is an opportunity to find out more about the wide range of jobs that engineers actually perform. In addition, they will gain the advantage of having valuable work experience that will mark them as an attractive job candidate.
New England Baptist Hospital’s Collaboration with Northeastern University’s Co-op Program

New England Baptist Hospital (NEBH) believes in mentoring tomorrow’s health care professionals today. Students have decisions to make about their future and what career path to choose. NEBH has partnered with Northeastern University and their Cooperative Education program (Co-op) for many years. For students, a Co-op is an approach to intellectual and professional growth and career success that demands continual learning and integration. A Co-op is a partnership, offering exposure to students and a pipeline to potential full-time employment.

Northeastern Co-ops are an integral part of the Rehabilitation Department at the hospital, working closely with the Physical Therapists (PTs) on a daily basis. Co-ops assist the PTs with patient rehab by helping to safely advance a patient’s mobility. The PTs rely heavily on the Co-ops to help out with patients and day-to-day activities in the department. The Co-ops learn from seasoned therapists and receive a comprehensive experience during their time at NEBH. Many Physical Therapy Co-op students are hired at the hospital after their co-op as Rehab Aides.

The program offers undergraduate students the opportunity to work for six months under the guidance of staff at NEBH. It allows students to participate in full-time work experience to complement the student’s major or field of study. Departments at NEBH that work with co-ops are: Rehabilitation Services, Finance, Nursing and Pharmacy.

New England Baptist Hospital offers Northeastern University students the chance to learn from healthcare leaders. The Co-op experience allows students to have real responsibility that augments the standard experience that is expected and required to enter a healthcare profession. Students work alongside physicians, nurses, and other professionals in the organization.

The Co-op program achieves a number of goals. These goals include:

- Creating the opportunity for NEBH to recruit future employees;
- Presenting an excellent way to find energetic and skilled employees;
- Finding a cost-effective strategy for workforce development;
- Providing a cost-effective way to evaluate prospective employees without long-term commitments;
- Feeding the leadership pipeline by early exposure to healthcare leaders; and
- Identifying student advocates for recruiting other students.

The Co-op program is a win-win for both the student and the hospital, resulting in a truly mutually beneficial partnership for both NEBH employees and Northeastern University students.
Northeastern University’s Cooperative Education Program

For more than 100 years, Northeastern University has been providing its students with innovative opportunities to gain real-world employment experience through its renowned Cooperative Education (Co-op) program. By providing students with invaluable employment experiences before they graduate, and employers a pipeline of skilled students that can be utilized to address short and long-term talent development needs, Northeastern has established itself as the global leader in experiential learning and a preeminent provider of workforce & talent development solutions.

Co-op allows Northeastern students to alternate between periods of academic study, when they’re in the classroom for a semester, with periods of 6-month, full-time, paid work experiences in companies of all shapes and sizes—locally, nationally, and globally. Over 10,000 students a year participate in the co-op experience; approximately 95% of the university’s undergraduate population complete at least 1 co-op and nearly two-thirds participate in 2-3 work experiences. In other words, upon graduation, the overwhelming majority of Northeastern graduates bring with them valuable workplace experiences well before many of their peers from other institutions, enabling them to hit the ground running in any workplace environment.

From Wall Street to State Street, to the halls of the State House and the White House, to startups in Cambridge and Silicon Valley, or to the manufacturing floors in China and Lynn, Northeastern has partnered with over 3,000 companies committed to filling their talent pools with NU student-employees. Many of these employer-partners are based in Massachusetts and extend across the region's leading industries. Organizations such as General Electric, Sanofi-Genzyme, Liberty Mutual, City Year, Dell EMC, Partners Healthcare, HubSpot, Fidelity, the City of Boston, Facebook—and many more—are contributing to the region’s global economic growth by cultivating these highly skilled students to become the leaders of tomorrow’s workforce.

While Northeastern can proudly point to dozens of strong co-op employer-partnerships, Dell EMC and General Electric stand out as stalwart relationships and have been for many years. Hopkinton-based Dell EMC has deep ties to Northeastern—company co-founders Richard Egan and Roger Marino are both NU alums. And over the last decade, Dell EMC has hired well over 1,100 co-ops into a host of roles, from engineering to business to corporate communications. Today, hundreds of Northeastern graduates make up the Dell EMC workforce, largely due to their co-op experiences, and several serve in senior leadership positions within the organization.

And for well over 50 years, GE has played a significant role in the co-op program as well, hiring over 1,200 co-ops within the last few years alone. Many NU co-ops have gained valuable experiences at GE, most notably at their aviation plant in Lynn—their manufacturing facility which builds jet-engines—but other business units have leveraged the value of co-op too, including: GE Power & Water; GE Oil & Gas; NBC Universal Television; GE Lighting & Industrial; and GE Transportation. General Electric relies heavily on the NU Co-op program as a primary pipeline for their entry-level and LDP (Leadership Development Program) recruiting efforts. Their long-standing history with Northeastern is reflected today in the nearly 1,000 alums working in the organization, including Jeffrey Bornstein, GE’s Chief Financial Officer. The fact that their corporate headquarters is now in Boston represents additional opportunities to further enhance an already strong relationship.

Finally, the General Electric and Dell EMC examples illustrate the power of a solid co-op partnership—both for the employer and the university. But whether it’s these two iconic organizations or the hundreds of other employers involved, a strong co-op relationship can, and often does, result in an effective way to expand partnerships with the university beyond recruiting needs—to the benefit of both parties. Many organizations have used co-op as a stepping stone toward broader university engagements—from research opportunities, to academic partnerships, to athletics sponsorships, and other innovative mergers—ultimately providing value to the Northeastern community and the employers involved.
Northmark Bank’s Commitment to Education

Northmark Bank sponsors and participates actively in various community educational partnerships. They regard their sustained staff volunteer effort in the partnerships as an important part of its commitment to and investment in its host communities. Its current educational partnerships include the following:

- **St. Augustine’s School (Andover, MA) Student Bank**: Northmark assisted the school in establishing this student bank in 1999 and during the following seventeen years has advised and assisted in its operation as a financial educational program. Participation in the student bank, which operates only during the academic year, is limited to students of grades four through eight. A Northmark Bank staff member participates in on-campus bank operations every two weeks. The school-based bank saving program helps students understand the importance of saving, understand how banks work and promotes financial literacy with hands-on learning.

- **James F. Hennessey School (Lawrence, MA) Reading Program**: Northmark staff members have read to Lawrence primary school students once a month for the past twenty years, first at the General Donovan School, and, after its closure, at the James F. Hennessey School. The monthly reader program for the Hennessey School in Lawrence is a building block in the promotion of literacy and financial knowledge in children. The reading program incorporates reading as well as basics in financial literacy including handouts age-appropriate for kindergarten, first and second grade students. Many of these handouts (coloring pages) or story ideas come from the U.S. Mint. The vast majority of the kindergarten students are coming to school for the first time and speak little English. By hearing the books read aloud, seeing the pictures in the book and handling the items passed around during class, the students get a multidimensional approach to learning.

- **The Lawrence (MA) Play and Read Floor Hockey League**: Lawrence Play and Read was founded four years ago by professional writer/professor/hockey coach Jay Atkinson, the pastor of St. Patrick’s Parish and a member of the Northmark staff. The innovative program combines two elements, a strong encouragement to read more and an introduction to the game of floor hockey. The League, open to all Lawrence boys and girls, grades 2-8, introduces new players to the game of hockey, helps more experienced players sharpen their skills, and emphasizes reading as a fundamental skill for learning and recreation. The program has been embraced by the City of Lawrence as a way to promote reading and involvement in school, particularly by students considered reluctant readers or edging toward being at risk. The League is free of charge, but all participants are strongly encouraged to read two to four age appropriate books, identified by the “Play & Read” program. Two members of the bank serve as coaches.

Northmark Bank believes in the importance of literacy and financial education and strives to get the local communities to engage on these issues as well. This is particularly important for younger children as getting ahead in reading early can have a lasting impact.
PwC’s Commitment to their Employees

For PricewaterhouseCoopers to deliver quality service and value to their clients—what they call the PwC Experience—they need their people to have a similar experience at the firm. Career satisfaction is focused on more than money—it’s also about having great client opportunities, learning and developing, building relationships, and being recognized for their accomplishments. But most of all, it’s about feeling supported as employees strive to achieve their own goals and grow their career.

PwC offers innovative and inspiring ways to reward their people and they are transparent in the way they talk with their people about pay. Their total rewards package is aimed to deliver the value needed to meet staff’s needs beyond just base compensation.

Through compensation strategy, PwC strives to provide employees with a compensation package that surpasses what their competitors offer, through a combination of salary, bonus opportunities, recognition awards, and non-monetary awards and benefits. This balanced approach results in a compensation program that aims to deliver value with depth and breadth to meet the employee’s needs and the firm’s needs on a number of different levels.

Unfortunately, student loan debt sometimes gets in the way of a person’s career satisfaction. Student loan debt is an issue at the heart of PwC’s Purpose: to build trust in society and solve important problems. PwC’s Student Loan Paydown (SLP) benefit also helps address a challenge experienced disproportionately by those in certain minority groups, and aligns with PwC’s Corporate Responsibility position as a leader around financial literacy.

The SLP benefit provides eligible associates and senior associates with $100 per month (or $1,200 per year) paid directly to their student loan servicer for up to six years, or until promotion to manager (whichever comes first). The SLP benefit has the potential over time to help eligible staff reduce their student loan principal and interest obligation by as much as $10,000 and shorten their loan payoff period by up to three years.

PwC understands the significant toll student debt can have. Aligned to their commitment to corporate responsibility, the Student Loan Paydown benefit is something PwC is proud to offer its employees.
Raytheon’s Partnership with the University of Massachusetts

UMass Amherst Microwave Program
Raytheon’s longstanding partnership with the University of Massachusetts began at UMass-Amherst with the collaborative creation of an engineering program in Microwave Engineering, which has provided a challenging and intensive graduate-level program since 1980. It has conferred more than 250 MS degrees to date from its ECE department. As part of Raytheon’s commitment, the company provides funding per year per student within the UMass-Amherst ECE department.

Engineering Research Center (ERC)
Raytheon and UMass-Amherst have also joined forces with other industry partners to fund a National Science Foundation grant for the creation of a new Engineering Research Center (ERC) for Collaborative Adaptive Sensing of the Atmosphere (CASA). The 43-million-dollar grant and Raytheon's ongoing support was provided to develop revolutionary sensing technology, which would enable earlier and more accurate forecasts of severe weather emergencies. As part of its core R&D effort, CASA has developed a prototype network of low-cost, polarimetric, doppler weather radars that can detect tornadoes at much lower altitudes than existing radars, thus tracking them as they actually form and touch down. For several years, CASA's rural Oklahoma test bed has demonstrated the ability to track twisters more accurately and alert emergency personnel earlier than ever before. Recently, the CASA radar on the Amherst campus helped issue alerts when tornadoes touched down right in the university's own backyard.

Raytheon University of Massachusetts Lowell Research Institute (RURI)
Raytheon greatly expanded on its partnership with the UMass system in 2015 by investing significantly to establish and build the Raytheon University of Massachusetts Lowell Research Institute (RURI). RURI is in the Emerging Technology and Innovation Center (ETIC) at UMass Lowell which is an 84-thousand-square-foot joint research facility. The ETIC focuses on the advancement of innovative technologies, including flexible and printed electronics. RURI serves as a launch pad for collaboration and learning among UMass Lowell faculty, students and Raytheon employees, which has earned the program multiple industry and academic awards, since opening its doors in January of 2015.

In any partnership, it is important for all sides to benefit in order for it to be sustainable. Raytheon's partnership with UMass is in its 36th year because of the results and success that both the company and institution have achieved through this partnership within their collective communities—benefiting employees, students, customers and beyond. The partnership gives students real-world perspectives on science, technology, engineering and math-related career opportunities and an in-depth understanding of the aerospace and defense industry as they prepare to enter the workforce. Meanwhile, Raytheon benefits by gaining access to research infrastructure, faculty expertise, an audience with students and educational opportunities for its employees as well as opportunities to develop and refine future technologies for its customers. All of these factors need to be present for such a partnership to be successful. By working together, Raytheon and UMass have achieved these goals, and have brought real-world advancements and innovations that are helping to save lives in high-consequence environments.
Shawmut Design and Construction & Wentworth Institute of Technology’s College of Professional & Continuing Education

Glancing around the Boston skyline it’s clear that the construction industry is booming. The strong economy is providing educational institutions, municipalities, retailers, hotels and more the resources to build and expand current facilities. The war for talent in the construction industry is on. As Shawmut’s client portfolio grows and diversifies there is a constant need to hire and develop construction management and building professionals.

Shawmut Design and Construction is partnering with Wentworth’s College of Professional and Continuing Education to design and deliver a construction skills curriculum. They have designed and are ready to launch a six-module workshop series that includes:

- Building Structures;
- Building Finishes;
- Mechanical, Electrical, Plumbing;
- Construction Scheduling;
- Construction Administration: and
- Project Costs and Finance.

The goal of the curriculum is to attract and develop world class construction talent so that Shawmut can exceed customer expectations on all projects. The curriculum provides existing employees an opportunity to enrich their careers and helps Shawmut attract talented graduates and experienced candidates.

The desired outcome of the curriculum is to have a pipeline of job-ready talent to take on new projects as project executives and business development professionals bring on new work. Shawmut has developed an evaluation approach that considers participants’ feedback, learning results, and business impact, and addresses client service excellence metrics.

There are many lessons to be learned from partnering with Wentworth Institute of Technology and CPCE:

- **Executive sponsorship is critical to engage the organization.** The Chief of Construction Operations is actively involved and has reached out to all participants and managers to emphasize the value and benefits of participating. All employees identified for the initial series are onboard to participate.

- **Co-branding demonstrates credibility.** Co-branding the curriculum highlights the commitment of both Shawmut and Wentworth to deliver industry leading programs. Wentworth is a leader in engineering, technology, design, and management education.

- **Clearly defined roles and expectations.** Together Shawmut and Wentworth mapped out specific timelines and expectations for Shawmut subject-matter-experts and Wentworth instructors. Given the pace of work and demands of academic scheduling, they were able to prioritize this work by planning ahead and consistently communicating and reinforcing.

Shawmut Design and Construction and Wentworth College understand the value that their collaboration brings to the table. By building curricula and establishing workforce pipelines, Shawmut and Wentworth are ensuring that students are learning the right things in school to add value to their post-graduation jobs.
Shire's Targeted Partnership with Quincy College

The team at Shire believes in helping to train the next generation of biotech employees at all education levels. Shire provides financial support, supplies and equipment, and staff knowledge to non-profits, vocational technical schools, community colleges and research institutions. Doing so has helped Shire develop a well-trained pipeline of employees, but it has also positively impacted the career trajectory of many who have gone on to work in other biotech companies. Given the constantly evolving nature of biotechnology manufacturing, Shire understands that industry needs to actively seek out and partner with educational institutions to ensure that students are trained on the most up-to-date and cutting edge techniques.

In 2011, Shire began working with Quincy College's Biotechnology Program in Quincy. The program is designed to prepare students for entry-level positions in biomanufacturing. Shire consulted with Quincy College to design a biotechnology laboratory that mirrored industry specifications and equipment. Shire also provided guidance on the development of biomanufacturing curriculum to ensure it was and continues to be relevant to industry. The award-winning program helps students develop a broad laboratory science-based background through courses focused in the life and chemical sciences.

Examples of the partnership between Quincy College and Shire:

- A member of Shire's Technical Operations team serves on Quincy's Biotechnology and Compliance Curriculum Design Advisory Board to inform curriculum design.
- A Shire employee is an adjunct professor in the Biotechnology Compliance program.
- Shire provides financial support to the Biotechnology Compliance program for its partnership with Jewish Vocational Services, a workforce development organization, in an effort to help transition students successfully to an Associate's degree program or Certificate program.
- Shire has donated approximately $100k worth of equipment and supplies to the program.
- Quincy College provides incumbent worker training to Shire employees both on and off site.
- Shire frequently hosts Quincy College students and faculty at Shire to share best practices and see real-time examples of the work students will be doing when they graduate.
- Shire managers and the Quincy College Biotechnology and Compliance program maintain an open line of communication to review the effectiveness of the program, the performance of Quincy College graduates, what is working, and what can be improved to better benefit the workforce.

Both Shire and Quincy College have learned from this partnership and continue to make changes to better serve the students at Quincy College and better meet Shire's talent needs and the changing needs of the biomanufacturing industry. For example, Shire is currently exploring ways to help students prepare more fully for interviews, since they realized that while students are being well-trained on state-of-the-art equipment, they need to be able to convey that in a formal interview setting. Shire is also exploring a mentorship program to give students a better idea of what it is like to transition from working in another field to working in a biotech company.

Shire's support of Quincy College's Biotechnology and Compliance program has helped sustain and strengthen the educational pipeline through the sharing of equipment, talent, and time which has proven to be extremely valuable for Quincy College, according to Program Chair Bruce Van Dyke. Shire has benefited from a well-trained pipeline of talent looking to begin a career in biotech, which in turn, helps ensure that they can manufacture a high-quality product. This is critical for patients. In addition, the partnership's impact goes far beyond just those students who come to work for Shire—the partnership has benefited all students that go through the program and enter the biomanufacturing field here in the Commonwealth.
Siemens’ Commitment to STEM Education

As a global electronics and engineering company, education is a priority at Siemens, specifically in the fields of math, science and technology.

Siemens partnered with academic institutions and Massachusetts Manufacturing Engineering Partnership (MassMEP), Manufacturing Advancement Center Workforce Innovation Collaborative (MACWIC), and Worcester Polytechnic Institute to address workforce and education gaps by providing Product Lifecycle Management (PLM) software and support to schools to improve their ability to better develop engineers and technologists for the PLM industry. Academic partners received in-kind software grants with low program fees, upgrades, technical support, training and community collaboration resources.

Because this software can be used at any academic level, both higher education institutions and vocational schools were recipients of the PLM software. The in-kind grant had a commercial value of nearly $700 million and the academic partners were: Worcester Polytechnic Institute, Fitchburg State University, Quinsigamond Community College, Berkshire Community College, Mount Wachusett Community College, North Essex Community College, MassBay Community College, Blackstone Valley Regional Vocational Technical High School, Assabet Valley Regional Technical High School, Tantasqua Regional High School, Greater New Bedford Regional Vocation High School, Worcester Technical High School.

This in-kind grant to the schools enabled schools to standardize curriculum and process, disseminate best practices while also establishing a network between schools. By providing the PLM software used by many companies such as BOSE, Waters Corp., Teradyne, EMC, Nypro, Textron, Reebok and Burton Snowboards this in-kind grant increases the number of the skill based locally.

By providing our partner MassWIC, with Siemens PLM software Siemens facilitated the standardization as they developed manufacturing training, specifically the Advanced Manufacturing Technology Certificate; thus employers are able to lower their cost per hire due to the supported credentialing.

Having key partners such as MassWIC and Quinsigamond Community College supporting the in kind grant lead to a successful partnership as they had close ties to the academic community. This partnership has provided positive impact to the Commonwealth because it leverages the role of education in driving the state’s advanced manufacturing industry and it supports the training and expansion of skilled workers.

Currently, Siemens also has a partnership with the New Bedford Public Schools and their goal is to increase K-5 student achievement in mathematics by providing content-specific professional development to teachers. Siemens will be providing the educational consultant with background in Mathematics to assist in the development of teachers. The professional development will help teachers develop a deep understanding of mathematics and support teachers in building a math leadership within their schools. In addition, Siemens holds Siemens Science Days (SSDs) in many 5th grade class rooms around the Commonwealth; in the near future SSDs will be expanding into the New Bedford Public Schools. Siemens Science Day is a fun and engaging way to promote math and science. It consists of Siemens professionals speaking to students, first hand, about the importance of math, science and technology education, the impact of STEM careers have on society and to perform hands-on science activities. Siemens work closely with Discovery Education to ensure activities meet national science and math teaching standards as they strive to enhance students’ STEM knowledge and interest. Siemens has done nearly 1,500 SSDs across the country and they hope to continue expanding their efforts in the commonwealth in order to inspire the future workforce.
UMass Partnerships throughout Massachusetts

The University of Massachusetts system has five campuses throughout the Commonwealth of Massachusetts. They acknowledge the fast-changing needs of today’s students and have partnered with numerous companies to give their students access to greater opportunities.

State Street

UMass Amherst—Isenberg School of Management: The State Street and Isenberg School of Management partnership was established in 2012 with the goal of providing internships to students with an interest in business. Since then, Isenberg has taken a lead role. For instance, from the beginning of this partnership, Isenberg has been designated as the “home” for credit bearing internship activity for all UMass students. This has helped to streamline the process for both State Street and UMass.

Recent points of interest:

- A primary objective of this partnership for State Street was to increase the number of full time hires over time. It is clear this goal is being met. As a result of their experience in Hadley, students move into a more advanced role with a higher salary upon accepting the offer;
- The win is significant for all students who have an opportunity to work at State Street. The value of this experience on resumes has given students increased confidence in the recruiting process and, as Isenberg anticipated, helped increase the number of internships UMass students pursue over time;
- Three years into this relationship, the State Street opportunity is viewed as a premier job by many students and they continue to apply as early as first/second semester of the freshman year;
- The Isenberg full time MBA program’s annual fall “BootCamp” was co-sponsored by a former State Street CFO, as well as State Street itself, at a location outside of Boston during the prior two fall semesters.

UMass Boston—College of Management and the College of Liberal Arts: The State Street Scholars Program launched in 2006 is a unique, year-long internship program for UMass Boston students in the College of Management and College of Liberal Arts. Each academic year students are selected for the program work at State Street Corporation, a world leader in the financial services industry. Successful applicants enroll in an internship course and work within the State Street Investor Services Division. They receive hourly pay and may also be eligible for assistance with educational expenses. This is an exciting opportunity for students to meld classroom education with real-world experience before graduation. Following completion of the program, over 80% of students are offered a full time position at State Street. The College of Management and State Street will be celebrating 10 years of the program this May. Over 350 students have participated in the program since its inception.

Raytheon

UMass Amherst—College of Engineering: The College of Engineering at UMass Amherst started a partnership with Raytheon in 1980. The Advanced Studies Program is the cornerstone of this relationship. Under the Advanced Studies Program each year, a new cohort of Raytheon employees comes to UMass Amherst to spend a year in residence in the Department of Electrical and Computer Engineering, learning the fundamentals of microwave engineering and receiving a MS degree. The support provided to the program by UMass and Raytheon together has created one of the top graduate programs in Microwave Engineering in the country. The Advanced Studies Program has expanded beyond the MS level, and Raytheon engineers are now getting their PhD’s in Electrical Engineering. The students selected for this program are Raytheon employees who are vetted by
both Raytheon and UMass. Upon acceptance to the program, students spend two semesters on campus taking courses, followed by the summer and fall being spent working on projects at Raytheon which serve as the equivalent to two courses. Raytheon pays the tuition and fees for their employees to enroll, and in turn, UMass gives Raytheon a reduced rate, resulting in a mutually beneficial partnership.

The National Science Foundation CASA Engineering Research Center was launched in 2003 in partnership with Raytheon. The center has been cited by peer reviewers as being, “A Model Engineering Research Center.” During its 10 years as an NSF ERC, CASA produced 150 graduates, published more than 400 refereed papers, and launched a new technology called “Dense Radar Networks.”

**UMass Lowell Research Institute:** On October 10, 2014 UMass Lowell officially opened the Raytheon-UMass Lowell Research Institute (RURI), a joint research institute with Raytheon. Focusing on research and development in the area of printable electronics and nanotechnology, the institute is headed jointly by Craig Armiento, professor of electrical and computer engineering at UMass Lowell, and Christopher McCarroll, technical director at Raytheon Integrated Defense Systems. This unique university-industry collaboration model allows UMass Lowell students and faculty to work side by side with Raytheon engineers in a state of the art research facility. This has provided both undergraduate and graduate students with opportunities to work on real world problems, and to gain workforce perspective from their Raytheon collaborators. Raytheon benefits from enhanced innovation development without the need for large scale infrastructure investment.

As stated by Dan Crowley, president of Raytheon Integrated Defense Systems, “The creation of RURI presents a tangible opportunity to advance the research and the learning of technologies under development for students and employees alike and will inspire future engineers and drive innovation.” The collaborative research capabilities of RURI benefit both organizations in the pursuit of federal research funding, advancing the knowledge and innovation of UMass Lowell students and Raytheon engineers. UML will be participating with a team including Raytheon and GE Global Research on an America Makes award worth $1 million.

In terms of lessons learned, a few key points are:

- Importance of an active leader representing each partner;
- Importance of the physical space to make the partnership visible (including to students) and to eliminate barriers to industry reps spending time on campus; and
- Importance of the regular interaction facilitated by the co-location – this helps the partnership to expand (e.g., in the classroom, capstone projects, multiple research fields).

**Vertex**

The Vertex Science Leaders Scholarship was created by Vertex in 2013 to assist Boston high school students in their pursuit of STEM higher education studies at the University of Massachusetts. Administered by the UMass Foundation, the Scholarship is available to seniors in the Boston Public schools and is a four-year, need, and merit-based scholarship, covering tuition and fees, room and board, and books at any of the four, undergraduate UMass campuses. Since 2014, five scholarships have been awarded. Currently, there are three Vertex scholarship awardees at UMass Amherst and two at UMass Boston. In addition to the Scholarship, Vertex has provided structured summer internship opportunities for awardees and has partnered with Bottom Line, an organization which helps low-income and first-generation-to-college students get to and through college.

With over 70,000 students throughout the system, UMass partners with a wide variety of businesses in order to give students access to additional resources and opportunities. Additionally, some partnerships help bring credibility to programs within the UMass system with their award winning project and reports. The UMass collaborations with businesses are a truly mutually beneficial arrangement.
Verizon’s Education Strategy

Verizon participates in a wide variety of education initiatives focused on improving student interest and achievement in STEM education. Programs are designed to deliver hands-on experiential learning opportunities that use mobile technology and include coding, design thinking, and entrepreneurship to underserved and underrepresented students to increase engagement and interest in STEM:

- **Verizon App Challenge**: For the past three years, Verizon has run a nationwide contest for middle and high school aged students to develop concepts for mobile apps that solve a community problem. This program encourages creativity, innovation, and STEM interest.

- **Results of Best in Nation Winner Westford Academy**: Inspired through the Verizon Innovative App Challenge, the team of high school students from Westford Academy launched an entrepreneurial venture with its Tactillium app. The Tactillium app brings engaging chemistry education to younger students and underfunded school districts by allowing students to conduct virtual chemistry experiments and observe the results in an immersive 3D lab environment.

- **Verizon Innovative Learning Grants**:
  - **Boston International High School, Boston**: Boston International High School and Newcomers Academy (BINcA) built a STEM Innovation program that utilizes robotics and rapid prototyping technologies to empower students to innovate and create.
  - **Dr. Consentino School, Haverhill**: This program provides teachers with professional development, as well as equips science classrooms at the Consentino School with science supplies and materials.
  - **John Breen School, Lawrence**: The Breen School offers science and technology enrichment for all students through its Early Childhood Science Enrichment program.
  - **Bartlett Community Partnership, Lowell**: The Bartlett Community Partnership, has partnered with other Lowell institutions, such as the University of Massachusetts Lowell and Middlesex Community College to launch an after school program funded by a 21st Century Community Learning Center grant.
  - **Lowell High School Maker Space**: The Lowell High School Maker Space and adaptive technology work stations provide engaging project-based STEM learning to 900 freshmen students each year.

- **Verizon Mobile Learning Academy**: The Verizon Foundation, ISTE and the Johns Hopkins University’s Center for Technology in Education are teaming up to offer a free, moderated five-module academy on how to integrate mobile learning into a school’s or district’s curriculum. Participating Massachusetts schools include: Assabet Valley Technical High School, Marlborough; Barnstable Public Schools, Hyannis; Collins Middle School, Salem; and Shore Education Academy, Chelsea.

- **Boston Private Industry Council**: Verizon Foundation supports the Boston PIC’s Classroom at the Workplace program which expands STEM career awareness and academic programming for Boston public high school students who have failed to pass MCAS.

- **Citizen Schools—STEM Apprentice Program**: Citizen Schools provides STEM enrichment for underserved Boston school students in an after school setting. Verizon IT employees volunteer as mentors to the sixth grade students participating in the 12-week program. They teach students how to code through the use of robots.

Verizon has a wide variety of partnerships with different education institutions however they all have the same goal: to increase student’s interest and knowledge in STEM fields. Through creative projects such as Verizon’s APP challenge and STEM professional development Verizon is working to ensure that students are learning and exploring all that STEM has to offer.
Vertex’s Commitment to Science, Technology, Engineering and Math (STEM) Education

Vertex is committed to inspiring and equipping the next generation of scientific leaders. Over the last five years, Vertex has developed strong relationships with Boston education leaders, schools and students across the city to help provide young people with a pathway for success in a STEM career. In 2013, Vertex entered into a unique three-year, $1.5M partnership with Boston Public Schools (BPS) and committed to working closely with two schools in the neighborhood, Boston Green Academy and Excel HS. That partnership has grown to include six schools and will continue to evolve in the years ahead. To date, Vertex has served over 1,000 students in one of their STEM programs and expanded their focus, from primarily high school students, to include middle school and college students. The goal is that students won’t experience Vertex through a one-time visit, but rather that Vertex will have multiple touch-points with students throughout their academic careers.

Their STEM programs and partnerships include:

- **Thomas M. Menino Learning Lab:** A 3,000-square-foot classroom and laboratory space that provides local students and teachers the opportunity to work alongside Vertex scientists to conduct experiments with cutting-edge technologies.

- **Science Fair Mentorship Program:** Students are paired with a Vertex mentor and receive guidance on science fair projects at the school, city and state levels.
  - In 2016, 27 students and 22 mentors participated in the program.

- **High school and college internships:** Students gain real-world professional experience exposing them to the possibilities of a career in STEM.
  - In 2016, they had 30 high school interns and nearly 100 college interns in the program.

- **Annual Vertex Science Leaders Scholarship:** The equivalent to a four-year, full scholarship is given to pursue an education in STEM at any University of Massachusetts campus.

- **Bottom Line:** Vertex is in the first years of their partnership with Bottom Line, which helps underserved, first-generation students get into college and succeed through mentoring and support throughout their college careers.

- **BoSTEM:** Vertex was the first corporate partner for a coalition formed by United Way of Massachusetts Bay and Merrimack Valley, Citizen Schools and Boston After School & Beyond in response to President Obama’s US2020 challenge to generate large-scale, innovative solutions to STEM education challenges in the U.S. BoSTEM's goal is to provide all BPS middle school students with a STEM learning experience by 2020.

- **Boston STEM Week:** During Boston STEM Week, regularly scheduled classes in Boston middle schools are replaced by STEM curriculum. In addition, volunteers from local companies visit classrooms to share experiences from their work and how they entered on a STEM related career path.

Vertex is truly committed to the expansion of STEM education throughout Massachusetts and works with community leaders and local schools to give students a pathway to success in STEM fields.