

# Ensuring the Capital Region's Global Success

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Reversing our "skills gaps" through high school  
education models

A report by:  **AMERICA'S EDGE**  
Strengthening Businesses Through Proven Investments in Kids



## Acknowledgements

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### Who We Are

The business leaders of AMERICA'S EDGE take a critical look at the knowledge, skills and abilities businesses need their employees to have in the 21<sup>st</sup> century, including the ability to be communicators, collaborators and critical thinkers. Using that analysis, we educate policy-makers and the public about high-quality, proven investments that strengthen businesses, establish a foundation for sustained economic growth, and protect America's competitive edge in a global marketplace, while helping our nation's children get on the right track.

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## Ensuring the Capital Region's Global Success

Reversing our "skills gaps" through high school education models

### Executive Summary

If current education and labor market trends continue, New York will face a deficit of 350,000 workers with mid-level skills to fill current jobs – those requiring more than a high school degree but less than a four-year degree. Looking forward, seven in 10 jobs created in New York between 2008 and 2018 will require some type of formal education beyond high school, and over 80 percent of the fastest growing and high-wage jobs will require at least a two-year degree. In that same period of time, 93 percent of jobs in the areas of science, technology, engineering and math (STEM) occupations will require post-secondary education. By 2018 throughout the state, nearly two times as many jobs requiring post-secondary education will exist as compared to jobs for those with a high school education or less.

The need for skilled workers is particularly evident in the five-county Capital Region, which has become a leader in technology, especially nanotechnology and related industries. The high-tech STEM companies that have moved into the area, such as GlobalFoundries, have expressed concerns about filling jobs that will be opening. This concern is backed up by the New York State Labor Department, which predicts a 71 percent increase in computer and electronic product manufacturing jobs in the Capital Region from 2010 to 2020, an increase of over 1,000 jobs where workers in STEM fields can earn a median salary of almost \$77,000. Similarly, the Manufacturing Institute recently estimated that 82 percent of the region's manufacturers struggle to find qualified candidates.

The skills deficiencies go beyond those related to specific occupations. Capital Region businesses are also concerned about the lack of increasingly important "soft skills" – communication, collaboration and critical thinking – required for virtually any occupation in today's world. Nationally, three out of four executives believe that soft skills will become even more important in the next three to five years because of global competition and the pace of change in the business environment.

A pipeline of skilled workers will be hard to create when 23 percent of New York high school students fail to graduate on time, and only 37 percent of our public school students graduate "college and career ready." Too many do not graduate at all. In the Capital Region,



Monty Rakusen - Getty Images

according to recent data, graduation rates range from a high of 93.8% (Voorheesville) to only 52.3% (Albany City). While New York State ranks number one in education spending, at the same time, we are spending \$70 million on remedial education.

To reverse these skills gaps, the Capital Region business leaders of *America's Edge* urge that our high school students have greater access to innovative education models that can equip them for success in both college and career.

Both promising and proven high school education models provide relevant and core academic curricula that prepare students for education and career beyond high school. These models, including many in New York, utilize project-based learning, numerous written and oral communication activities, and work-based learning opportunities. Students are taught how to apply the knowledge they have acquired in one subject to use in different situations – students "learn to learn."

While we concentrate on making education relevant, we must also ensure continued implementation of New York's new rigorous standards – the P-12 Common Core Learning Standards – which will better ensure students develop the skills required by today's businesses. We must also assess student learning to determine how they are progressing and use this information to improve education so more students will be college- and career-ready. Finally, we must ensure that we are accurately assessing if teachers are effectively teaching these enhanced skills sets and if students are, in fact, developing the skills the business world now requires.

**The bottom line:** The future of New York's and the Capital Region's economy depends upon the caliber of our workforce. As we continue the debate on meaningful education reform, the conversation must include promising and evidence-based education approaches and college-and-career-readiness standards that develop and assess skills in our students that businesses expect – and need – from their workforce. New York business leaders are calling for continued implementation of New York's new rigorous standards and aligned assessments, and greater access to innovative high school models to better equip young people for success in both post-secondary education and their future careers.





# Ensuring the Capital Region's Global Success

## Reducing our "skills gaps" through high school education models

**Unprepared Students, Unprepared Workers:** Although businesses have always needed workers proficient in the "3 Rs" – reading, writing and arithmetic – today's fast-paced, international marketplace requires even higher proficiency levels in these hard skills. But they are too often lacking, especially among those entering the workforce.

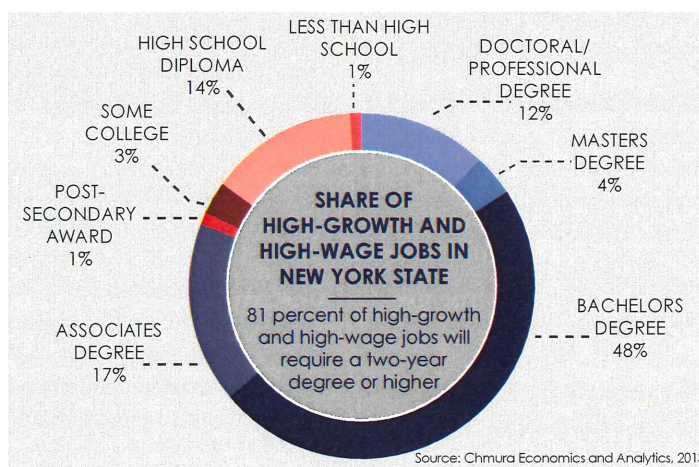
- According to the Nation's Report Card, only 35 percent of New York 8<sup>th</sup> graders are proficient in reading, only 30 percent are proficient in math, and only 29 percent are proficient in science.<sup>1</sup>
- Twenty-three percent of New York high school freshmen do not graduate within four years.<sup>2</sup> For several Capital Region counties, the proportion of students not graduating on time is higher than the state average, in Warren County (25 percent) and Schenectady County (24 percent). The proportion of students who do not graduate within four years is even higher in the Albany City School District (48 percent) and the Schenectady City School District (43 percent).<sup>3</sup>
- Only 37 percent of New York public school students graduate "college and career ready". In New York City, only 21 percent graduate college and career ready.<sup>4</sup>
- Only 41 percent of 2012 high school graduates in New York taking the ACT admission test met college readiness benchmarks in the four core areas tested – English, algebra, social science, and biology.<sup>5</sup>

- While New York State ranks number one in education spending, at the same time, we are spending \$70 million on remedial education throughout the SUNY system.<sup>6</sup>

In addition to the "hard skills," employers are increasingly concerned about a lack of "soft skills" – communication, collaboration, and critical thinking. In a 2010 survey of 2,000 executives conducted by

the American Management Association, three out of four executives believe that soft skills will become even more important in the next three to five years because of global competition and the pace of change in the business environment.<sup>7</sup> But, in that same survey, nine out of ten executives said that soft skills like communication, collaboration and critical thinking are important to support

business expansion, but less than half of those executives rated their employees as above average in those skills.<sup>8</sup>



## Growing New York Skills Gaps

With weak education outcomes, dissatisfied employers, and an increasing emphasis on soft skills, how will the New York workforce of the future fare? Data suggest that New York needs to make major changes to keep its workforce competitive with other states and internationally.



## Examples of Middle-Skills Jobs New York Can't Live Without:



- EMT
- Firefighter
- Police officer
- Carpenter
- Electrician
- Plumber
- Dental hygienist
- Medical lab technician
- Aircraft mechanic
- Heating and AC installer
- Industrial machinery mechanic
- Machinist
- Legal secretary
- Computer support specialist

### Middle-Skill Jobs Mismatches

If current education and labor market trends continue, New York will face a deficit of 350,000 workers with mid-level skills to fill current jobs.<sup>9</sup> Middle-skill jobs – those that require less than a four-year degree, but more than a high school diploma – account for at least one third of all New York jobs.<sup>10</sup> Middle-skill workers include registered nurses, health technicians, carpenters, construction workers, installation/repair technicians, production workers, and transportation/material moving workers. While middle-skill jobs in New York comprise 33 percent of the jobs statewide, the supply of workers today with these skills comprise only 29 percent of the workers.<sup>11</sup>

### Science, Technology, Engineering and Math (STEM) Occupations

Jobs that are heavily reliant on technology are growing fast. The number of STEM jobs in New York is expected to grow by 10 percent between 2008 and 2018.<sup>12</sup> Workers often need post-

**“We’ve got jobs out there that can’t be filled because we can’t find qualified workers to fill them.”**

**Tush Nikollaj**  
President and CEO  
Logicalnet Corporation,  
Albany, NY

secondary education to capitalize on these types of jobs. In fact, 93 percent of New York STEM jobs will require post-secondary education by 2018, and 71 percent will require a bachelor’s degree or higher.<sup>13</sup>

Health care jobs are also growing in New York, with 22 percent growth between 2010 and 2020 compared to 13 percent growth in other jobs. But only 16 percent of health care jobs in 2020 will be for those with only a high school diploma; 84 percent will require some post-secondary education.<sup>14</sup> Over half of New York hospitals surveyed reported difficulty recruiting experienced nurses. A shortage of nurses with the right experience was cited as the primary reason for 41 percent of hospitals with recruiting problems.<sup>15</sup>

The need for skilled workers is particularly evident in the five-county Capital Region, which has become a leader in technology, especially nanotechnology and related industries. The high-tech STEM companies that have moved into the area, such as GlobalFoundries, have expressed concerns about filling jobs that will be opening.<sup>16</sup> This concern is backed up by the New York State Labor Department, which predicts a 71 percent increase in computer and electronic product manufacturing jobs in the Capital Region from 2010 to 2020, an increase of over 1,000 jobs where workers in STEM fields can earn a median salary of almost \$77,000.<sup>17</sup>

Similarly, the Manufacturing Institute recently estimated that 82 percent of the region’s manufacturers struggle to find qualified





candidates.<sup>18</sup> These struggles are not unique to the Capital Region. Seven out of 10 U.S. manufacturing companies surveyed in 2011 reported a moderate to severe shortage of available, qualified workers, especially in skilled production jobs such as machinists and technicians.<sup>19</sup>

### Rising Education Requirements

The increased skill levels for future jobs directly correlates to increased educational requirements for those jobs. The anticipated growth rates for occupations for New York are skewed towards jobs that are either highly skilled – needing a bachelor’s degree or above – or middle skilled – requiring more than a high school degree but less than a four-year degree.<sup>20</sup> By 2018 throughout the state, nearly two times as many jobs requiring post-secondary education will exist as compared to jobs for those with a high school education or less.<sup>21</sup> Similarly, by 2022, about 81 percent of the fastest growing occupations that have above-average wages will be jobs that require a post-secondary education of an associate’s degree or higher.<sup>22</sup>

**FOURTEEN** of the 25 fastest growing occupations in New York require post-secondary education.

*-New York State Department of Labor, A Closer Look at Occupation Projections 2010*

The educational mismatch in New York is dire. There will be 2.8 million total job vacancies in New York between 2008 and 2018, from new jobs and job openings due to retirements and career switches.<sup>23</sup> While 15 percent of New Yorkers lack a high school diploma or equivalent, only 10 percent of these job vacancies will be available for those without a diploma. In New York City, over 20 percent of the population may be fighting for the 10 percent of these low-level jobs.<sup>24</sup>

## Required Skills and Traits for Manufacturing

### What Was Needed Then...

- Learning one or two specific technical roles
- Physical strength & flexibility
- Ability to follow fixed, unchanging procedures
- General attention to production & safety procedures
- Following orders
- Operating, maintaining, designing mechanical machinery

### ...And What's Needed Now

- Mechanical reasoning, logic, troubleshooting & spatial visualization
- Personal flexibility, communication & cooperation
- Initiative, persistence & independence
- Attention to detail, self-control & dependability
- Making independent decisions
- Operating computers or computerized machinery & using computers for a wide range of critical functions

Handler et al., 2009

In contrast, between 2008 and 2018, occupations requiring at least an associate’s degree are projected to grow three times faster than occupations that only require on-the-job training.<sup>25</sup> And by 2018, 63 percent of all jobs in New York will require some post-secondary education, the 18<sup>th</sup> highest rate in the country.<sup>26</sup> But only 41 percent of New Yorkers 25 or older have an associate’s degree or higher.<sup>27</sup> The fastest growing occupations that are likely to be hardest hit include registered nurses, accountants and auditors, computer software engineers, nursing aides and attendants, and elementary school teachers.

### Acceleration of the Skills Gap

Experts believe the recession may have accelerated a demand for higher skilled workers because many companies turned to higher skilled workers while not replacing laid-off lower skilled positions because they have automated jobs or shipped jobs overseas. Traditional manufacturing was the hardest-hit sector in

**“It’s no secret that the nanotech companies coming into the Capital Region, including GlobalFoundries, will have trouble finding the highly skilled workers needed to fill their job openings.”**

**John C. Cavalier**  
Ret. CEO of MapInfo, Inc.  
Watervliet, NY



the Empire State in the last decade. The sector lost almost 300,000 jobs, or 40 percent of all manufacturing jobs.<sup>28</sup> Jobs losses of over 10,000 per year through 2016 are projected due to positions shifted out of the state or country and curtailed demand from increased productivity.<sup>29</sup>

**“The skills gap is an issue that warrants immediate attention – our economic competitiveness and national security depend on having a readied STEM workforce. Now more than ever, business and education must partner to ensure that students are being prepared for entrance into college and the innovation economy.”**

**Heather Briccetti**  
President and CEO  
The Business Council of  
New York State, Inc.

An aging population could also be a factor. The leading edge of the baby boom generation turned 65 in 2011, and the share of New York's population age 65 or older is projected to rise from 13 percent in 2000 to 20 percent in 2030.<sup>30</sup> Retirements of highly trained employees, coupled with increased demand for health care as the area's population ages, could lead to increased shortages in areas like nursing. Registered nurse jobs in New York are projected to grow by 14 percent, or 2,410 new jobs, annually until 2016.<sup>31</sup> But a survey of New York hospitals found that over 75 percent of the nursing workforce is over age 40 and almost 15 percent of the workforce is expected to retire in the next five years – over 11,000 RN retirements. Due to educational limitations, the number of new nurses is not keeping up with demand. Researchers have thus forecasted a severe nursing shortage for the next 15 years.<sup>32</sup>

Geographic shifts may also impact worker shortages. Population projections from the U.S. Census Bureau suggest that the overall working-age population (ages 16-64) in New York will decline by 6.5 percent between 2010 and 2025, a slide of over 860,000 workers.<sup>33</sup> In the Greater Capital Region, population projections suggest that the next 20 years will bring a decline in the overall number of workers, with or without the necessary skills for critical jobs. Analysts predict open jobs with no workers to fill them.<sup>34</sup>

## The United States Is Falling Behind

New York is not alone. Thanks to technology, more and more American workers are now directly competing with workers from around the world. How U.S. students stack up against students

from other countries is, thus, increasingly important – but the United States is no longer on top.

The U.S. high school graduation rate ranks in the bottom quarter of developed nations.<sup>35</sup> On an international test of applied knowledge and skills, the Programme for International Student Assessment (PISA), U.S. 15-year-old students score significantly below the average for industrialized nations in math and trail far behind leading countries like Korea, Japan and Finland in reading and science.<sup>36</sup> Once a leader in math education, U.S. high school students now fall in the bottom half of teenagers from developed countries. The U.S. is getting worse results while spending almost 40 percent more on education: U.S. spending per student in 2009 was over \$11,800, compared to an industrialized nation average of about \$8,600.<sup>37</sup> And in New York, education spending per student is even higher, at about \$15,900 in 2009.<sup>38</sup>

### Worker Shortages in the Capital Region

“The evidence indicates that there will be a large demand for highly skilled technicians [in the Capital Region] that the current workplace cannot fill...And over time, the gap will widen...With the projected addition of 1,200 technicians needed by GlobalFoundries and GE in two years, the shortage will become severe.”

-Regional Talent Pipeline Study, 2009

Although higher education attainment in the U.S. has continued to climb, we are not keeping pace with other nations and not growing fast enough to keep up with labor market demand. As recently as 1995, the U.S. was tied for first in college graduation rates. But as other countries dramatically improved their college completion rates, the U.S. has fallen to 13<sup>th</sup> out of 25 industrialized nations – decidedly in the middle of the pack.<sup>39</sup>

## High Cost of the Skills Gap

The lack of a skilled workforce comes at a high cost for individuals, businesses and the economy.

The unemployment rates in New York for occupations that require a bachelor's degree or higher are at least three percentage points lower than the unemployment rates for occupations that





**ONCE A LEADER** in math education, U.S. high school students now fall in the bottom half of teenagers from developed countries - behind such countries as Slovenia, Hungary and Poland, and far behind leading countries like Korea, Japan and Finland.

-Organisation for Economic Co-operation and Development, 2010

are typically filled by someone with a high school diploma or less. The wage gains from even attempting some post-secondary training are clear across the state as well, with workers with an associate's degree earning almost \$12,000 more than a high school graduate and more than \$20,000 more than a high school dropout.<sup>40</sup> In the Albany-Schenectady-Troy MSA, the findings are even more stark, with the average wage for those with at least an associate's degree being more than \$20,000 greater than the average wage of a high school dropout.<sup>41</sup>

Graduating an additional 1,000 of New York's high school dropouts could result in impressive economic benefits. These 1,000 extra graduates would likely:

- collectively earn \$12 million more in an average year than they would have without a diploma;
- spend \$1.2 million more each year purchasing vehicles;
- buy homes worth \$25 million more by the time they reach the midpoint of their careers;
- support 80 new jobs in the state;
- increase the gross state product by \$16 million; and
- increase state revenues by \$1.3 million annually through their increased spending and investments.<sup>42</sup>

High school dropouts are so much less productive than high school graduates that each new class of New York dropouts will earn \$9.8 billion less over their lifetimes than their high school graduate peers.<sup>43</sup> These staggering earnings losses translate into less spending power, fewer contributions to the

tax base and lower productivity. The returns from a college degree are even greater. The average lifetime earnings of an individual college graduate are \$2.1 million higher than those of a high school dropout and \$1.6 million higher than a high school graduate.<sup>44</sup>

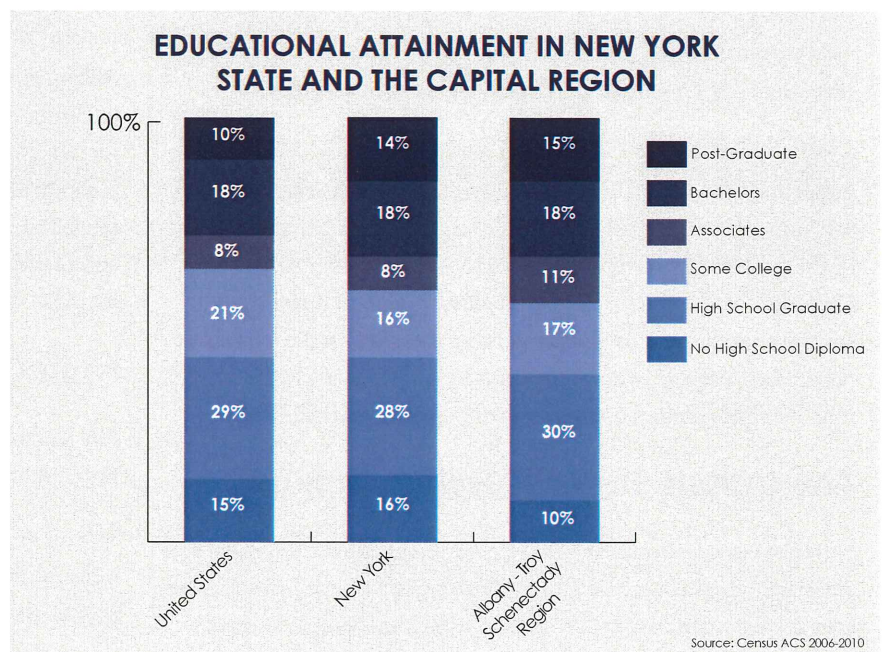
Remedial courses and training to help students catch up and get on track for higher education and training are helpful, but they are expensive and inefficient. For example, about half of all students entering the state community college system require remediation.<sup>45</sup> Remedial education costs students and the state an estimated \$248 million annually, and up to \$348 million annually after factoring in the reduced lifetime wages of students taking remedial courses.<sup>46</sup>

## Changing Course

As New York and the nation wrestle with the vitally important debate on education reform, businesses know that career relevance must be incorporated into the classroom. Too many students do not understand *why* they need to know what they are being taught, lose interest in school and then do not develop the deeper learning skills employers expect them to have. Innovative high school education models help students stay engaged in school so they graduate with a concrete understanding of what they will need to succeed in the workforce and education post-high school, thus better ensuring New York businesses have a workforce armed with the skills required in a global marketplace.

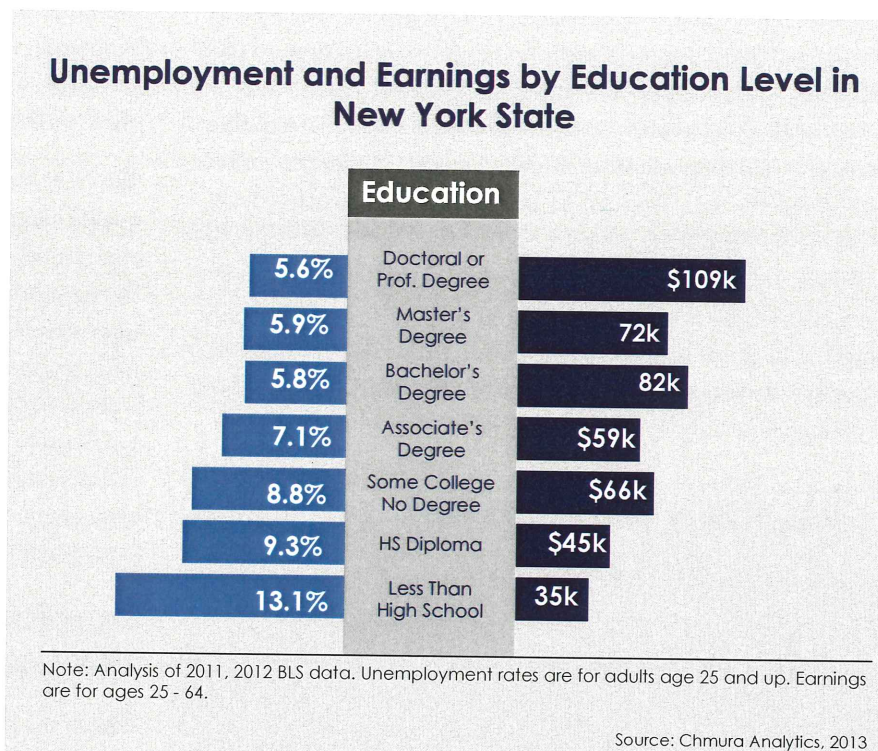
## Developing Deeper Learning Skills

Business leaders know that young people entering college and the workforce need a mastery of core academic subjects. But they need more:





- The critical thinking and problem-solving skills necessary to find answers to challenges that – unlike multiple choice tests – are not on the page in front of them.
- Part of those skills come from learning how to learn – knowing how to find out what they do not already know.
- They will need effective written and verbal communication skills to work as part of a team, or to interact with the public.
- And, to work as a team, they will have to master collaboration skills, such as interpreting others messages and responding appropriately.



This preparation includes going beyond rote learning to transfer what they have learned in one subject and apply it in novel ways or different settings in the workplace. It also requires the ability to regulate one's own behavior and emotions to reach goals. Research cited by the National Research Council, for example, shows that being conscientious – “being organized, responsible, and hardworking – [has] the strongest correlation with desirable work and educational outcomes [whereas] anti-social behavior ... is negatively correlated with these [desirable] outcomes.”<sup>47</sup> These are skills that can be taught and reinforced, especially in the workforce. All of this goes beyond “textbook” learning to provide students and workers with the skills now needed in a competitive global market.<sup>48</sup>

## New York State P-12 Common Core Learning Standards

The New York State P-12 Common Core Learning Standards (CCLS), when fully implemented with their aligned assessments, will ensure that students develop the deeper learning skills required by today's businesses.

Until recently, each state has had its own particular educational standards and tests to assess student achievement. Standards varied greatly across states and even among school districts within a state. State tests also vary, in content and on the level of performance deemed “proficient.” As a result, there is a lot of confusion about how students are really doing and businesses have no objective way to compare job applicants from different states—a high

school diploma from a state with high standards likely comes with a different skill set than one from a state with low standards.

The CCLS offer a way out of this dilemma. The CCLS are based on the Common Core State Standards (CCSS)<sup>49</sup>, which were developed and led by the nation's governors and chief state school officers, and have been voluntarily adopted by 45 states, as well as the District of Columbia, four U.S. territories and the Department of Defense Education Activity. The New York State Board of Regents adopted the CCSS in July 2010<sup>50</sup> and, in July 2011, adopted the CCLS, with some New York-specific standards added.<sup>51</sup> The CCLS were implemented starting in the 2012-2013 school year.

The CCLS establish a shared, rigorous set of educational standards for English language arts and mathematics for P-12 education. The standards reflect businesses' needs for a highly-skilled workforce that has mastered core academic content and is able to think critically, solve complex problems and communicate effectively (i.e. deeper learning skills). The CCLS establish the content and skills that children must learn at each grade level, but they do *not* tell teachers how to teach, nor do they specify a curriculum; these important decisions remain under teacher, local or state control.

New York is a member of the Partnership for Assessment of Readiness for College and Careers (PARCC)<sup>52</sup> consortium, one of the two main groups of states developing assessments based on the CCSS. The assessments will be implemented in 2014-2015. The





assessments will allow educators to determine how students are doing and to use this information to improve education, so more students will be college- and career-ready. Short-term assessments will allow teachers to determine students' understanding of concepts and then adjust teaching in real time, to increase understanding. The data from these assessments will also help educators identify and share educational practices that work with other schools and districts. Employers could also use new assessment scores to compare applicants and find those who have the reading and language or math skills needed. In 2012-2013, students in grades 3-8 are taking interim New York state tests that have been redesigned to align them with the CCLS.

## Tech Valley High – Albany

Tech Valley High School was “developed in partnership with business, organized labor, and government to be a resource for the region’s evolving technology ecosystem”. It currently enrolls 125 students from 46 school districts. Students are selected by lottery; they include youth in the following categories—18% minority, 45% female, 40% free or reduced price lunch, and 18% with disabilities.<sup>57</sup>

The school has a STEM focus and a project-based learning environment. Courses are team-taught and integrated with a real world context. Over 150 partners from business and the high-tech community work with teachers to co-design, co-teach, and co-assess curriculum projects.<sup>58</sup>

Results are impressive. Of two graduating classes, all students graduated (97% Regents diploma, 3% local diploma), all were accepted to college (some chose military or employment), 68% are attending four-year colleges, and nearly 50% pursued STEM studies or employment (compared to 7% nationally). All students leave with a digital portfolio of their learning, including documentation of the ability to collaborate and work in teams, innovation and creativity, critical thinking, tech and information literacy, and self-direction. In addition, Tech Valley High School trained over 100 educators in 2011-12.<sup>59</sup>

In addition to assessments, in order to affect student outcomes, we also need stronger curricula, compatible with the CCLS. Better pre- and in-service training will also be necessary, including support for teachers and leaders learning how to use the CCLS assessment data effectively.<sup>53</sup> As assessments will be

computer-based, schools must also have sufficient hardware and bandwidth to accommodate the assessments. However, current spending will cover a significant proportion of the costs of implementing the CCLS.<sup>54</sup>

The CCLS can help ensure that students are receiving a high-quality education consistently, from state to state. The new educational standards and assessments will not magically turn things around overnight. Because the CCLS are more rigorous than New York’s prior standards<sup>55</sup>, the new assessments are going to be tougher than previous state tests. At first there is likely to be a decrease in test scores, not because students are doing worse, but because we will be accurately measuring how well students are meeting higher standards. With rigorous standards and assessments our students will be better prepared for success in post-secondary education and the workforce.

## Developing Skills Businesses Need through High School Education Models

One of the best – and proven – ways to impact the skills gap is to equip high school students for success in both post-secondary training and/or education and their future careers. Students need to understand how education is relevant to a career, understand their options and what is expected in the work place, and develop communication, collaboration and critical-thinking capabilities. Innovative models and approaches are achieving these goals.

A common element to these proven and promising high school education models is the integration of rigorous academics, career-relevant instruction, support services for students and real-world, work-based learning experiences supported by industry and community partners over a three- or four-year period. A number of schools have also adopted educational approaches that focus on problem-solving, communication, and collaboration skills.

### Career Academies and Pathways

Career Academies is a proven approach found throughout the United States and in New York that incorporates real-world, work-based learning. Although some programs are stand-alone schools, including charter or magnet schools, most are pathways within larger comprehensive high schools. Often called a “school-within-a-school,” pathways typically comprise no more than 200 students who stay together with the same teachers for the duration of the program. That continuity helps create close relationships among the students, their peers and their teachers. It creates the kind of “team player” mentality employers too often find lacking in their younger employees.<sup>56</sup>

Key elements in proven and promising high school education models, such as Career Academies, are:



# Enhancing Deeper Learning Skills

## Master Core Academic Content

Students must be able to demonstrate a baseline understanding of core content knowledge and apply facts, processes and theories to real-world situations.

## Think Critically and Solve Complex Problems

Students must be able to apply tools and techniques learned from core subjects to formulate and solve problems, using them to evaluate, integrate and critically analyze multiple sources of information. Students must be able to learn to reason and construct justifiable arguments creatively, encompassing non-linear thinking and persistence.

## Work Collaboratively

Students should demonstrate the ability to cooperate together to identify and create solutions to social, vocational and personal challenges. This includes the

ability to identify common goals; to organize resources necessary for meeting group goals; and to learn to communicate and incorporate multiple points of view to better achieve goals.

## Communicate Effectively

Students must be able to organize their thoughts and findings in clear, meaningful and useful ways and express themselves in both written and oral forms. They must be able to listen well and present others' concepts, as well as their own.

## Learn How to Learn

Students must be aware of their strengths and weaknesses and be able to monitor and direct their own learning. They should understand and be prepared to meet changing expectations in a variety of academic, professional and social environments.

- *Work-based learning* such as mentorships, job shadowing opportunities and internships with local employers brings actual career relevance to the students, deepening their understanding of how traditional academics are used in careers. This helps direct them toward training and education opportunities that will get them the skills New York employers are seeking.<sup>60</sup>
- *Project-based learning* helps students make connections across subjects and brings greater relevance to classroom learning. Students work together on projects, developing academic and technical skills, as well as more experience with collaboration, communication and critical thinking.<sup>61</sup>
- *School-based enterprise*, like student-led businesses or community service initiatives, is another form of work-based learning. It allows students to design, produce and deliver real products and services.
- *Support services*, including counseling as well as additional instruction in reading, writing and mathematics, help students keep their grades up and stay on track for graduation.<sup>62</sup>

the computer, engineering or media technology sector eight years after graduation, thus helping to increase the supply of STEM workers.<sup>63</sup> Young people who went through Career Academies earned more and were more productive than those not in the program.<sup>64</sup>

## Other Innovative Education Models

A number of schools around the nation have adopted educational approaches to promote deeper learning and help ensure that students focus on these critical problem-solving, critical thinking, communication, and collaboration skills. Included among the educational models that focus on developing these skills are Expeditionary Learning, EdVisions Schools, Big Picture Learning, and New Tech Network. Although evaluation research has not yet assessed the effectiveness of these models, their focus on these key learning skills that businesses need shows promise for helping students be better equipped for problem-solving, critical thinking, communication and collaboration.

In New York, there are several school models that focus on cultivating deeper learning skills.

- Expeditionary Learning (EL) is a comprehensive school reform model that uses project-based learning to help students cultivate critical thinking, problem-solving, and

In a well-designed study of Career Academies across America, students were twice as likely as nonparticipants to be working in





## INNOVATIVE NEW YORK PROGRAMS THAT IMPLEMENT DEEPER LEARNING

### Smart Scholars

The Smart Scholars/Early College High School initiative is targeted to students from groups that are generally underserved and under-represented in post-secondary education (70% qualify for free and reduced price lunch). Initiatives begin no later than 8th grade and occur in either an autonomous school or a school-within-a-school. This is an important point—in order to build a college-going culture, they must be more than simply “programs”.<sup>75</sup>

In 2009, private funding paid for 11 initiatives (\$6M). In 2011, State funding paid for 12 new initiatives, plus funding for four of the original cohort to expand (\$6M). This year, there is an investment of \$4M in the State Budget. Governor Cuomo has proposed opening 10 new P-Tech schools in the 10 Economic Development Regions.

### NanoHigh and Girls Inc. Eureka!®

The College of Nanoscale Science & Engineering (CNSE) is the first college in the world dedicated to research, development, education and deployment in nanoscience, nanobioscience, nanoengineering, and nanoeconomics. In 2004, CNSE awarded the world's first PhD degrees in nanoscience.

CNSE understands that, in order to continue to award such high honors, we must invest in students' education long before they enter into post-secondary studies. That is why CNSE has created two programs, NanoHigh and Girls Inc. Eureka!®, to cultivate talents in the STEM fields.<sup>77</sup> NanoHigh is the first program of its kind in the U.S. Since 2007, 90 Albany High School students

Data collected in Fall 2010-Summer 2012 showed that 3,105 students earned 8,723 transferrable college credits. Ninety-eight percent of current students are on-track to graduate high school. They have been offered 177 college courses.<sup>76</sup>

There are three initiatives in the Capital Region, with a total of 487 students participating. They are: Albany Smart Scholars ECHS (City School District of Albany partnering with Hudson Valley Community College, University at Albany, and RPI), Clean Technologies Smart Scholars ECHS (Ballston Spa School District partnering with Hudson Valley Community College, Saratoga Springs CSD, and several CBOs), and Schenectady ECHS (Schenectady County Community College partnering with the Schenectady City School District).

have received certificates for successful completion of the program, which combines classroom work at Albany High with hands-on laboratory activities at CNSE.<sup>78</sup>

The Girls Inc. Eureka!® program encourages young women to pursue opportunities in nanotechnology. The program began with a cohort of 30 8th grade girls in 2012. Over the next five summers, the program will continue to work with that cohort, as well as another 150 girls, at no cost. The program is co-sponsored with SEFCU, which is also providing wrap-around programs related to leadership development, workforce preparation, financial literacy, and service to the community.<sup>79</sup>



collaboration. A hallmark of this school reform model are learning expeditions, which are interdisciplinary real-world projects which serve as the primary curriculum units in EL schools. Student success is assessed using three indicators: academic achievement, quality of student work, and evidence of student engagement.<sup>65</sup> Expeditionary Learning has a network of 165 schools in 29 states, including 25 schools in New York State.<sup>66</sup>

- In New Tech High Schools, students engage in project-based learning focused on exploration and inquiry.<sup>67</sup> Students work in four-person peer groups to master all state graduation requirements.<sup>68</sup> Technology is fully integrated into instruction and supports the entire school community.<sup>69</sup> Students attending New Tech high schools have stronger academic, high school graduation, and college enrollment outcomes than the national averages for high school students.<sup>70</sup> There are 15 New Tech High Schools in New York.<sup>71</sup>
- The Big Picture Learning education model focuses on five learning goals: empirical reasoning, quantitative reasoning, communication, social reasoning, and personal qualities, with an emphasis on work-based learning.<sup>72</sup> Students earn the same number of credits, take the same Regents exams, and graduate with a New York State Regents diploma just like students in traditional school settings. Unlike traditional schools, Big Picture School students earn their credits through individual learning plans that are based upon their interests and passions.<sup>73</sup> Students spend two days a week working alongside a professional mentor in the workplace and publicly present their learning four times a year. Big Picture Learning (BPL) was established in 1995 and now has served over 26,000 students nationwide, with six Big Picture Schools in New York.<sup>74</sup>

Although evaluation research has not yet assessed the effectiveness of models such as these, their focus on key learning skills that businesses need shows promise for helping students be better equipped for problem-solving, critical thinking, communication and collaboration.

Through these promising models, New York high school students understand the skills they will need in a particular occupation and can make more informed decisions about post-secondary education and training. Whether they go directly into the workforce or pursue advanced education, these students will ultimately enter the workforce much more prepared to hit the ground running, potentially reducing the time and cost of on-the-job training.

## CareerZone

CareerZone is the New York State career exploration and planning system developed and maintained by the NYS Department of Labor and provided at no cost to users. Students, parents and educators across the State are increasingly turning to CareerZone to find out what is happening in the labor market and how to plan for education and career opportunities in the future.<sup>80</sup>

CareerZone is designed to help students explore career information in a fun and easy way. It's also designed to introduce students to opportunities in careers with which they are not familiar. For example, a STEM Portal in CareerZone helps connect students with a broad range of STEM careers, STEM workshops, internships and events in local communities across the state. This STEM Portal provides career videos, labor market information and job postings to bring these STEM careers to life and provide a full picture of these exciting opportunities.

CareerZone also includes lesson plans for educators to use. The plans are linked to State Learning Standards and will soon be crosswalked with the P-12 Common Core Learning Standards.<sup>81</sup>

## Conclusion

New York State – and the Capital Region – runs the risk of falling behind when it comes to preparing the future workforce to compete successfully in a global economy. To meet the future demands of a more skilled and educated workforce, policy-makers should make sure we invest in what really works and include promising and evidence-based approaches that will ensure young people enter the workforce with the skills New York businesses need. State school districts should be encouraged in fully implementing the New York Common Core Learning Standards and aligned assessments, and the state should grant its school districts greater flexibility to incorporate proven or promising education models using deeper learning into their high schools. They can draw on their existing resources, and state funding, to follow these approaches. If we are serious about securing New York's economic future we must act now to get our businesses the highly-skilled workforce we need to innovate and grow in the global marketplace.





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