



# Ensuring North Carolina's Global Success

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Reducing our "skills gap" through proven  
investments in kids

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

## Acknowledgements

This report was authored by Stephanie Schaefer, Lindsay Warner, and Susan L. Gates.

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AMERICA'S EDGE commissioned an analysis by Chmura Economics and Analytics of the educational and occupational trends in the state of North Carolina and selected communities.

### 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 policymakers 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.

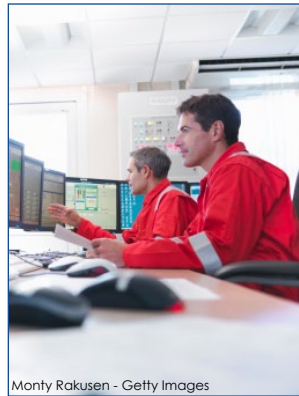
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## Ensuring North Carolina's Global Success

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### Executive Summary

If current education and labor market trends continue, North Carolina could face a shortage of 46,000 workers. Some areas of our state are already experiencing a deficit of highly educated and "middle-skill" workers. Looking forward, experts estimate that approximately 77,000 middle-skill workers are at risk of being "under-employed" but lack the education to move into occupations that typically require a bachelor's degree or higher.



Monty Rakusen - Getty Images



Extensive research demonstrates that high-quality early learning lays the foundations for the development of both the hard skills and the soft skills, with children who participated in the programs more likely to graduate from high school, earn a post-secondary degree, and earn more as adults. But North Carolina will not have to wait 20 years to benefit from investments in early learning. This report shows these investments provide an immediate and

surprisingly big boost to North Carolina's economy through sales of local goods and services. In fact, investments in early learning out-perform investments in other sectors in our state, including manufacturing, construction, transportation, and wholesale and retail trade.

To more immediately address the lack of hard and soft skills, particularly in younger workers, our high school students must have greater access to innovative education models that can equip them for success in both college and career. Today, education is too often separated from real life, so it can be hard for students to see how education will be relevant to them as adults. This is one reason why one in five of North Carolina high school students does not graduate high school on time, and less than 30 percent of residents have a bachelor's degree. These promising and proven education models provide relevant and core academic curricula, while also incorporating project-based learning, numerous communication activities, critical thinking exercises, and work-based learning opportunities.

**THE BOTTOM LINE:** The future of North Carolina's economy depends upon the caliber of our workforce. We must invest in what works in our education system if we are going to develop the skilled workforce our businesses need today and into the future. As we continue the debate on strengthening the education system in our state, the conversation must include laying the foundations for success in school through quality early care and education and expanding access to education approaches that help students develop the skills our businesses expect – and need – from their workforce.

The jobs of the future will require much higher numbers of individuals with an associate's degree or higher. But today, only 38 percent of working-age adults in our state have that level of educational attainment. North Carolina jobs requiring post-secondary education are expected to grow 65 percent faster than jobs for high school dropouts. Twice as many new jobs requiring post-secondary education will exist as compared to jobs for those with a high school education or less. Positions in science, technology, engineering and math (STEM) are growing particularly fast, and 91 percent of these jobs will require post-secondary education by 2018.

The deficiencies go beyond those related to specific occupations. North Carolina businesses are also concerned about the lack of the increasingly important "soft skills" – communication, collaboration and critical thinking – required for virtually any occupation in today's global marketplace. Six out of 10 surveyed North Carolina employers reported communications skills gaps among job applicants, and close to half reported deficiencies in critical thinking and problem-solving abilities. 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

To reverse these skills gaps, the North Carolina business leaders of *America's Edge* urge that we strengthen two parts of that education system: high-quality early care and education and high school education models that will help develop crucial skills needed to produce a world-class, competitive workforce.



# Ensuring North Carolina's Global Success

## Reducing our "skills gap" through proven investments in kids

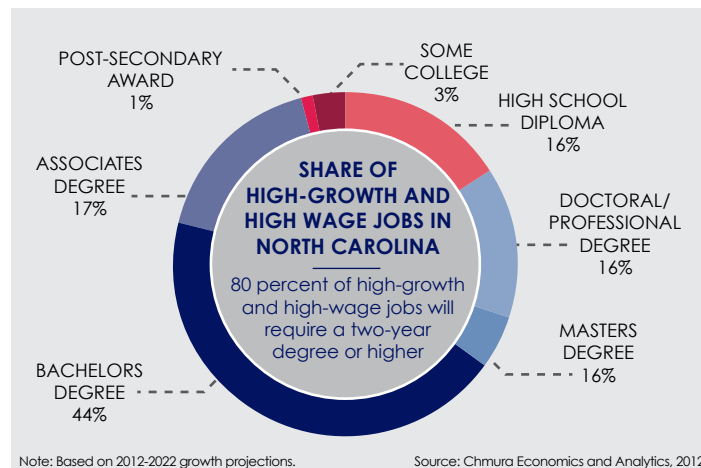
**Unprepared Students, Unprepared Workers:** Although businesses have always needed workers proficient in the "3 Rs" – reading, writing and arithmetic – today's fast-paced, international marketplace requires even higher proficiency levels in these hard skills. But they are too often lacking, especially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

Consider these facts in North Carolina:

- In 2001, North Carolina ranked 4<sup>th</sup> in the nation in terms of per capita degrees granted in science and engineering. In the latest rankings, North Carolina has fallen to 31<sup>st</sup> in the nation.<sup>1</sup>
- Only 38 percent of North Carolina workers ages 25 to 64 have at least an associate's degree. An additional 23 percent have some college education, but no degree.<sup>2</sup>
- Only 30 percent of North Carolina Class of 2012 graduates taking the ACT college admissions test met college readiness benchmarks in all four core areas tested – English, math, reading and science. Students were least prepared in science.<sup>3</sup>
- 22 percent of high school students do not graduate on time;<sup>4</sup>
- 63 percent of eighth graders are below grade level in math and 74 percent are not proficient in science;<sup>5</sup> and

- 66 percent of fourth graders read below grade level.<sup>6</sup>

These statistics do not bode well for the ability to fill jobs that have increasingly higher education and/or training requirements.



In fact, if current education and labor market trends continue, North Carolina could face a long-run shortage of 46,000 workers.<sup>7</sup> The Winston-Salem MSA is already experiencing a deficit of highly educated workers, as well as middle-skilled workers – those with an associate's degree or other professional or vocational certificate. An analysis of occupational trends in North Carolina also shows that

approximately 77,000 middle-skill workers are at risk of being under-employed but lack the education to move into occupations that typically require a bachelor's degree or higher.<sup>8</sup>

What is driving these estimates? The highest annual job growth projected over the next ten years in North Carolina will be for jobs requiring a two-year degree or higher – constituting 80 percent of high growth and high-wage jobs in our state. Experts predict these jobs may be difficult to fill.<sup>9</sup>



Between 2008 and 2018, North Carolina jobs requiring post-secondary education are expected to grow 65 percent faster than jobs for high school dropouts. In occupations that are expected to have the highest deficits of skilled workers through 2022, 30 percent of positions will require post-secondary education.<sup>10</sup> Twice as many new jobs in North Carolina will require post-secondary education as jobs for those with a high school education or less.<sup>11</sup>

Jobs that are heavily reliant on technology are also growing quickly. The number of STEM jobs in North Carolina is expected to grow by 17 percent between 2008 and 2018, on par with the national average.<sup>12</sup> About 20 percent of the fastest growing occupations over the next ten years in North Carolina will be jobs that require an education foundation in STEM.<sup>13</sup> Of those STEM jobs, 91 percent will require post-secondary education by 2018 – 65 percent will require a bachelor’s degree or higher.<sup>14</sup>

Technology is also increasingly central to many jobs in manufacturing, which has shifted to more advanced, computer-assisted production, replacing the manual labor force with automation on the shop floor. To remain viable, workers in manufacturing facilities must now have a technical skill or trade-based skill that machines cannot adequately perform, such as knowledge of mechanical and electrical engineering processes, the ability to operate automated manufacturing systems, and the ability to work with computerized systems and read and write machine programming code.<sup>15</sup>

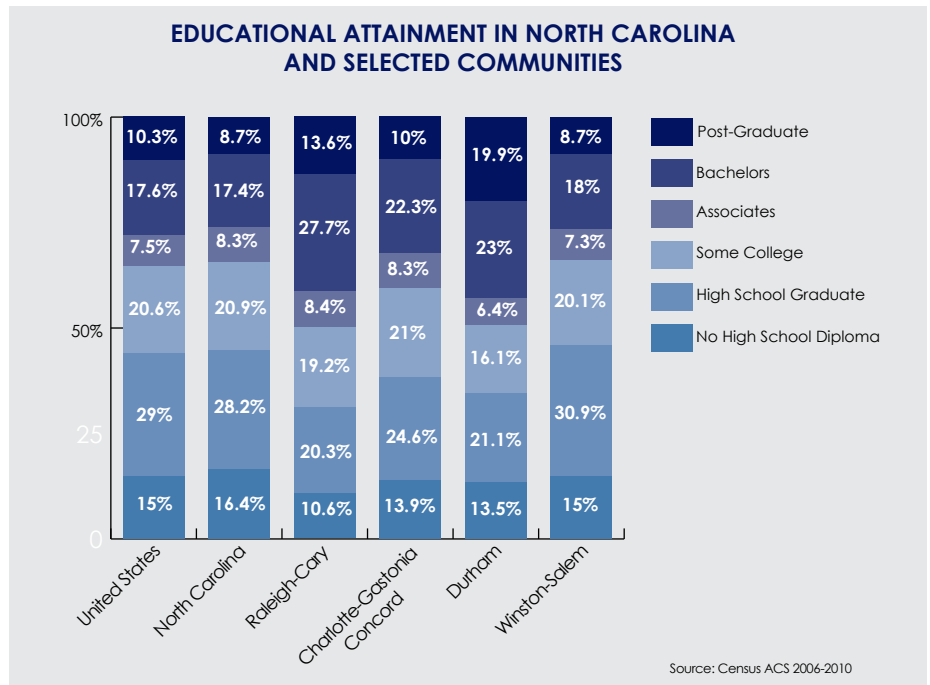
Health care jobs are also growing rapidly in North Carolina, with 33 percent growth expected between 2010 and 2020. But only 18 percent of North Carolina health care jobs in 2020 will be for those with only a high school diploma – 82 percent will require some post-secondary education.<sup>16</sup>

The inability to find skilled workers will hurt North Carolina’s competitive readiness. Workforce shortages or skills deficiencies will have a significant impact on the ability to expand operations or improve productivity – perhaps even forcing companies to move operations out of the state.

**“Too many young people simply are not getting the training and education they need, and too many young people are dropping out of school. That’s costing our business, and that’s costing our economy.”**

**Machelle Sanders**  
Vice President and  
General Manager,  
Biogen Idec

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 shows



## Deficiencies in "Soft 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.



that “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>17</sup> All of this goes beyond “textbook” learning to provide students with the skills now needed in a competitive global market.<sup>18</sup>

While recognizing their importance, North Carolina employers report major gaps in the soft skills. Six out of 10 surveyed North Carolina employers reported communications skills gaps among job applicants. Close to half of those surveyed reported deficiencies in critical thinking and problem-solving abilities. 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.<sup>19</sup> But in a 2010 survey of 2,000 executives conducted by the American Management Association, nine out of 10 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>20</sup>

**“By working in teams and gaining real work experience, students begin to understand the importance of professionalism, reliability, teamwork and clear communication skills.”**

**Drew Schwartz**  
President and CEO,  
Fluid Flow Products, Inc.

## High Cost of the Skills Gap

The lack of a skilled workforce comes at a high cost for individuals, businesses and the economy. In North Carolina, workers with an associate’s degree earn annually almost \$15,000 more than a high school graduate and nearly \$25,000 more than a high school dropout.<sup>21</sup> High school dropouts are so much less productive than high school graduates that each new class of

## 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

North Carolina dropouts will earn \$4.4 billion less over their lifetimes than their high school graduate peers.<sup>22</sup> The returns from a college degree are even greater. The average lifetime earnings of an individual college graduate are \$2.1 million dollars higher than those of a high school dropout.<sup>23</sup> These staggering earnings losses translate into less spending power, fewer contributions to the tax base and lower productivity.

Higher levels of education can also help protect against unemployment. In 2011, 14 percent of high school dropouts nationwide were unemployed. Those without a diploma who were employed were only making an average of \$451 per week. In contrast, only five percent of those with a bachelor’s degree were unemployed, and employed college graduates could expect to make an average of over \$1,000 per week.<sup>24</sup>

Graduating just an extra 1,000 of North Carolina’s high school dropouts – less than 2 percent of the class of 2010’s dropouts – could result in impressive economic benefits. These 1,000 extra graduates would likely:

- collectively earn \$11 million more in an average year than they would have without a diploma;
- spend \$1.1 million more each year purchasing vehicles;
- buy homes worth \$24 million more by the time they reach the midpoint of their careers;



- support 100 new jobs in the state;
- increase the gross state product by \$14 million; and
- increase state revenues by \$1 million annually through their increased spending and investments.<sup>25</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. One third of recent North Carolina public high school graduates transitioning to community colleges enrolled in at least one remedial class, along with five percent of four-year college students. North Carolina students who place into remedial coursework are far less likely to complete their degrees, with only 10 percent of community college students graduating within three years and half of four-year college students graduating within six years.<sup>26</sup> In North Carolina, remedial education costs students and the state an estimated \$113 million annually, and up to \$168 million annually after factoring in the reduced lifetime wages of students taking remedial courses.<sup>27</sup>

## Changing Course

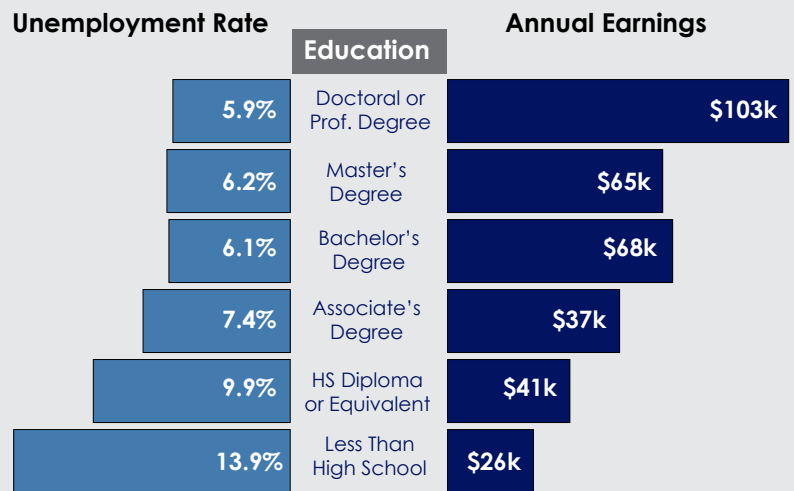
As North Carolina and the nation wrestle with the vitally important debate on strengthening our education system, businesses know that students need to understand *why* they need to know what they are being taught, stay engaged in school, graduate, and develop the skills employers expect them to have. We can better achieve those goals in two ways:

- Lay the foundations for success in school and the development of hard and soft skills through high-quality early care and education; and
- Expand access to high school education models that provide project-based and work-based learning experiences, while developing critical thinking and communications skills.

## Laying Foundations for College-and-Career-Readiness Skills

Extensive research demonstrates that high-quality early learning lays the foundations for the development of both the hard and soft skills. But North Carolina will not have to wait 20 years to benefit from investments in early learning. Those investments will boost our state's economy today.

## Unemployment and Earnings by Education Level in the State of North Carolina



Note: Analysis of 2011, 2012 BLS data. Unemployment rates are for adults age 5 and up. Earnings for ages 25 - 64.

Source: Chmura Analytics, 2012

## Short-Term Impact: Increased Sales of Local Goods and Services

New research by AMERICA'S EDGE found that attracting skilled employees, strengthening local and state economies now and improving businesses' bottom lines can be achieved through cost effective and proven investments in quality early childhood care and education programs.<sup>28</sup> This report used IMPLAN, a system first developed 19 years ago, that is widely used for conducting a variety of economic impact and related analyses and adheres fully to standard input-output and IMPLAN conventions.<sup>29</sup>

This economic impact modeling system found that, for every additional \$1 invested in early care and education in North Carolina, \$1.91 is generated in total spending within the state. This strong economic boost for local businesses is higher than investments in other major sectors such as retail trade (\$1.87), transportation (\$1.85), construction (\$1.81) and manufacturing (\$1.57).<sup>30</sup> Research shows that among North Carolina's major economic sectors that will spur economic growth, early care and education offers one of the smartest ways to create additional buying power for consumers and help local companies stay in business.

A word of caution, however. This "multiplier" works in reverse. Thus, every \$1 cut from early learning programs in North Carolina will result in a loss of a total of \$1.91 in sales of goods and services from North Carolina businesses.



## The Early Learning sector in North Carolina generates more additional spending in the economy than other major economic sectors

### Economic Sectors

### Output Multipliers

<b>Early Care and Education<sup>1</sup></b>	<b>\$1.91</b>
Retail Trade	1.87
Transportation	1.85
Farming, Logging, Fishing, Hunting	1.81
Construction	1.81
Wholesale Trade	1.69
Mining, Oil, Gas	1.64
Manufacturing	1.57
Utilities	1.31

Every \$1 invested in the early learning sector generates an additional 91 cents in the local economy.

1. The early care and education sector is part of the larger services sector, which on average generates a multiplier of \$1.91 for every \$1 invested.

Source: IMPLAN, 2010 analysis of Type SAM Output Multipliers for North Carolina

To ensure all North Carolina children under age 5 have access to quality early care and education would ultimately require an investment of an additional \$2.3 billion – a goal for the future as funding becomes available. That investment would yield annually \$2.1 billion in additional sales in North Carolina’s economy outside of early care and education, for a total of \$4.4 billion of new money infused into the state.<sup>31</sup> And most of these dollars generated in North Carolina would stay in North Carolina – helping local businesses improve sales in almost every sector. Here are some examples of the impact that investing in early learning would have on the major economic sectors in North Carolina:

- **Over \$470 million in new sales in the state’s services sector**, which employs the largest proportion of workers in North Carolina. The additional dollars would benefit many small businesses including dry cleaners, mobile phone and cable companies and numerous professional firms such as accounting, law and tax offices.<sup>32</sup>

- **Over \$400 million in new sales in real estate and construction** – providing a boost to the slumping real estate market and helping many low- and middle-income families keep up with their mortgage or rental payments.<sup>33</sup>
- **Over \$360 million in new dollars to North Carolina’s insurance and finance sectors**, including local banks and insurance companies.<sup>34</sup>
- **Over \$290 million in new sales in North Carolina’s retail and wholesale trade sectors**, including grocery stores, department stores and auto dealers.<sup>35</sup>
- **Over \$220 million in new sales in North Carolina’s health services sectors**, including hospitals and doctors’ offices.<sup>36</sup>

“How do we ensure our graduates have the skills that are key to sustained economic growth? The answer may surprise you: Start educating our children earlier and do it better.”

**Harvey Schmitt**  
President & CEO,  
Greater Raleigh Chamber  
of Commerce

The \$2.1 billion in additional spending outside of early care and education will be generated in over 400 economic categories. Of those 400-plus categories, here are just a few concrete examples of increased sales for North Carolina businesses:





- Over \$100 million in sales from local restaurants, the cost for over 29,000 families of four to eat out for one year;<sup>37</sup>
- Over \$50 million in sales from telecommunications companies, equal to the annual cost of telephone services for over 34,000 families of four;<sup>38</sup>
- Over \$26 million in sales from local electric companies, the cost of monthly electric bills for over 14,600 families of four for one year;<sup>39</sup>
- \$17 million in sales from local supermarkets, the cost of a year of groceries for 3,300 families of four;<sup>40</sup>

Investments in the early learning sector are very competitive with investments in other major sectors, and these investments create an immediate generation of economic activity throughout North Carolina.

### Long-Term Impact: Economic Growth and Security

In addition to boosting North Carolina's economy today, investments in high-quality early learning programs would also have significant long-term benefits that would establish a foundation for sustained economic growth and security.

High-quality early care and education is a critical step to support the development of the skills North Carolina businesses now require in their workforce. Research studies demonstrate that children who participate in high-quality early learning can do better on a range of outcomes:

- **Better preparation to succeed in elementary school** – for example, children who attended Tennessee's pre-kindergarten program had overall gains in literacy that were 50 percent greater than for children who did not attend.<sup>41</sup>
- **Less special education** – children who attended the Chicago Child-Parent Centers program were 40 percent less likely to need special education;<sup>42</sup>
- **Lower rates of retention in school** – children participating in the Abecedarian early education program in North Carolina were 43 percent less likely to be held back in school;<sup>43</sup>
- **Higher rates of high school graduation** – children attending the High/Scope Perry Preschool Program in Michigan were 44 percent more likely to graduate from high school;<sup>44</sup>

## The Abecedarian Project

One of the best studies of comprehensive early learning for young children is the Abecedarian Project, conducted right here in North Carolina. Led by researchers at the University of North Carolina at Chapel Hill, the project studied a group of 111 infants who were provided high-quality early care and early learning up to age 5 or were randomly assigned to a control group without the high-quality Abecedarian Project. This intensive intervention was studied using a randomized trial, the gold standard for research evidence. The researchers returned to study the children as they grew up, following them through age 30.<sup>49</sup>

The results from participating in high-quality early learning were impressive. Children who participated in the early learning program were 43 percent less likely to be held back in school.<sup>50</sup> By age 30, Abecedarian project participants were four times more likely to have earned a four-year degree than those not in the program. By age 30, participants were 42 percent more likely to have been consistently employed than those not in the program.<sup>51</sup>

- **Higher rates of college graduation** – by age 30, Abecedarian project participants were four times more likely to have earned a four-year college degree than those not in the program.<sup>45</sup>
- **Less crime** – children not offered the Perry program were five times more likely to become chronic offenders by age 27;<sup>46</sup> and
- **Higher rates of employment** – children in the High/Scope Perry Preschool Program were 22 percent more likely to be employed at age 40.<sup>47</sup>

Studies of high-quality early education programs for at-risk children have shown that these programs can save as much as \$16 for every dollar invested.<sup>48</sup> These long-term benefits are realized when the children who receive high-quality early learning grow up and become better educated and more productive workers, with far less remedial education or criminal costs to society. That is a return on investment that cannot be matched by almost any other public investment.



## Early Care and Education in North Carolina: An economic snapshot

Early care and education programs serve young children from birth through age 5. These programs take several forms, including child care centers, family child care homes, private preschool programs, and publicly funded and regulated early education programs including public pre-kindergarten, Head Start and early childhood special education programs provided by the public schools. In North Carolina, approximately 450,000 young children under age 5 are not served by regulated early care and education settings.<sup>52</sup>

Early care and education is an important economic sector in North Carolina, making significant contributions to the local economy:

- 65 percent of children under the age of 6 in North Carolina have both or their only parent in the work force.<sup>53</sup>
- North Carolina' early care and education sector generates more than \$1.7 billion dollars annually in gross receipts (including both public investments and parent fees).<sup>54</sup>
- In 2011, North Carolina invested \$327 million on state-funded early care and education programs, which in turn generated an additional \$298 million in economic activity, for a total of \$625 million in economic activity for the state.<sup>55</sup>

## 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 is a proven approach found throughout North Carolina and the United States 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:

- *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 North Carolina employers are seeking.<sup>57</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>58</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>59</sup>

In a well-designed study of Career Academies across America, students were twice as likely as nonparticipants to be working in the computer, engineering or media technology sector eight years after graduation, thus helping to increase the supply of STEM workers.<sup>60</sup> Young people who went through Career Academies earned more and were more productive than those not in the program.<sup>61</sup>

Included among the educational models that focus on developing these skills in North Carolina are Expeditionary

“Everyone seems to be talking about the need for education reform. Do what works. Giving more students access to programs that bring career relevance into our North Carolina classrooms will move our state forward as a leader in our global economy.”

**Tom Haffner**  
President,  
P.T. International Corp.

Learning and New Tech Network. These education models focus on cultivating the skills North Carolina businesses need:

- Expeditionary Learning (EL) is a comprehensive school reform model that uses project-based learning to help students cultivate critical thinking, problem-solving, and 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>62</sup> Expeditionary

## Enhancing Deeper Learning Skills

### Skills Necessary for Success

To be equipped with the knowledge and abilities businesses now require, students must:

#### 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.

# INNOVATIVE HIGH SCHOOL MODELS

## Academy of Engineering Charlotte, NC

The Charlotte-Mecklenburg Schools offer several high school Career and Technical Education Academies to prepare students for college and professional careers, including the Academy of Engineering program. The Academy of Engineering program is offered at five local high schools: Hopewell, Mallard Creek, Phillip O. Berry Academy of Technology, East Mecklenburg, and Vance High Schools. These schools offer academic learning experiences combined with a themed curriculum designed to help students develop the critical thinking and problem-solving skills today's businesses need. The Academy of Engineering schools educate students in the principles of engineering, offering students the opportunity to earn college credit and participate in work-based learning experiences.<sup>65</sup> The Academy of Engineering curriculum was developed by Project Lead the Way, and are part of a national network of academies with the National Academy Foundation, following the Career Academies model.

Five years ago, four of these high schools (Hopewell, Mallard Creek, Phillip O. Berry Academy of Technology, and Vance) began planning efforts to implement their engineering academy programs. In Spring 2013, these four initial schools will graduate their first classes of Academy of Engineering students, a group of over 150 students. More than 900 students in grades nine through twelve participate in the Academy of Engineering program at all five local schools.<sup>66</sup>

## Olympic Community of Schools Charlotte, NC

The Olympic Community of Schools, part of the Charlotte-Mecklenburg Schools, began its conversion in 2005 into a campus with five theme-based small high schools, including a Math, Engineering, Technology and Science school. These small learning communities provide project-based and work-based learning opportunities to prepare students with depth in subject matter, as well as critical thinking, communication, creativity, and collaboration skills.<sup>67</sup>

Olympic has partnered with the business community and post-secondary education institutions to help students be college- and career-ready. For example, Olympic High School, Siemens Energy, and Central Piedmont Community College have together created an apprenticeship program in which students combine coursework with work-based learning at Siemens, gaining valuable skills and experience in skilled technical jobs. Students complete a four-year program with pay, develop skills in mechatronics technology, and are offered full-time employment after successfully completing their apprenticeship.

Since Olympic Community of Schools' transformation into a small schools campus in 2006, student test scores have improved dramatically, with a 65 percent increase in student proficiency. High school graduation rates have risen 22 percent.<sup>68</sup> Olympic has gotten strong results while remaining a neighborhood school, not a magnet school. This is notable because it means that the school improved student performance while serving children from the same local neighborhoods, rather than by recruiting higher-performing students across the school district.



Students at a Career Academy get hands-on technical experience.



Students at a Career Academy collaborate as a team.



Learning has a network of 165 schools in 29 states, including 3 schools in North Carolina: in Shelby, Asheville, and Boone.<sup>63</sup>

- New Tech Network works nationwide with schools to support innovations in education, helping students gain the knowledge and deeper learning skills they need for college and career success. Key features of this instructional approach are project-based learning, use of technology, and maintaining a school culture of trust, respect, and responsibility. New Tech Network supports 120 schools in 18 states and Australia, including 4 schools in North Carolina: in Wadesboro, Durham, Raleigh, and Warrenton.<sup>64</sup>

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.

Through these promising models, North Carolina 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.

## MeckTech

### Charlotte, NC

MeckTech is an initiative that works with Charlotte businesses and schools to identify career pathways for students to help develop the skills today's businesses need. MeckTech helps identify skilled career opportunities including in IT, energy, finance, motorsports, healthcare, and manufacturing. Working with local businesses, MeckTech works to develop partnerships to create a coherent pipeline and successful transition from K-12 to post-secondary education to the workplace.<sup>69</sup>

## Conclusion

North Carolina runs the risk of falling behind when it comes to preparing its 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 are spending our education dollars on what really works and include changes that will ensure young people enter the workforce with the skills North Carolina businesses need. If we are serious about securing North Carolina's economic future, we must act now to get North Carolina businesses the skilled workforce we need.



## Endnotes

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