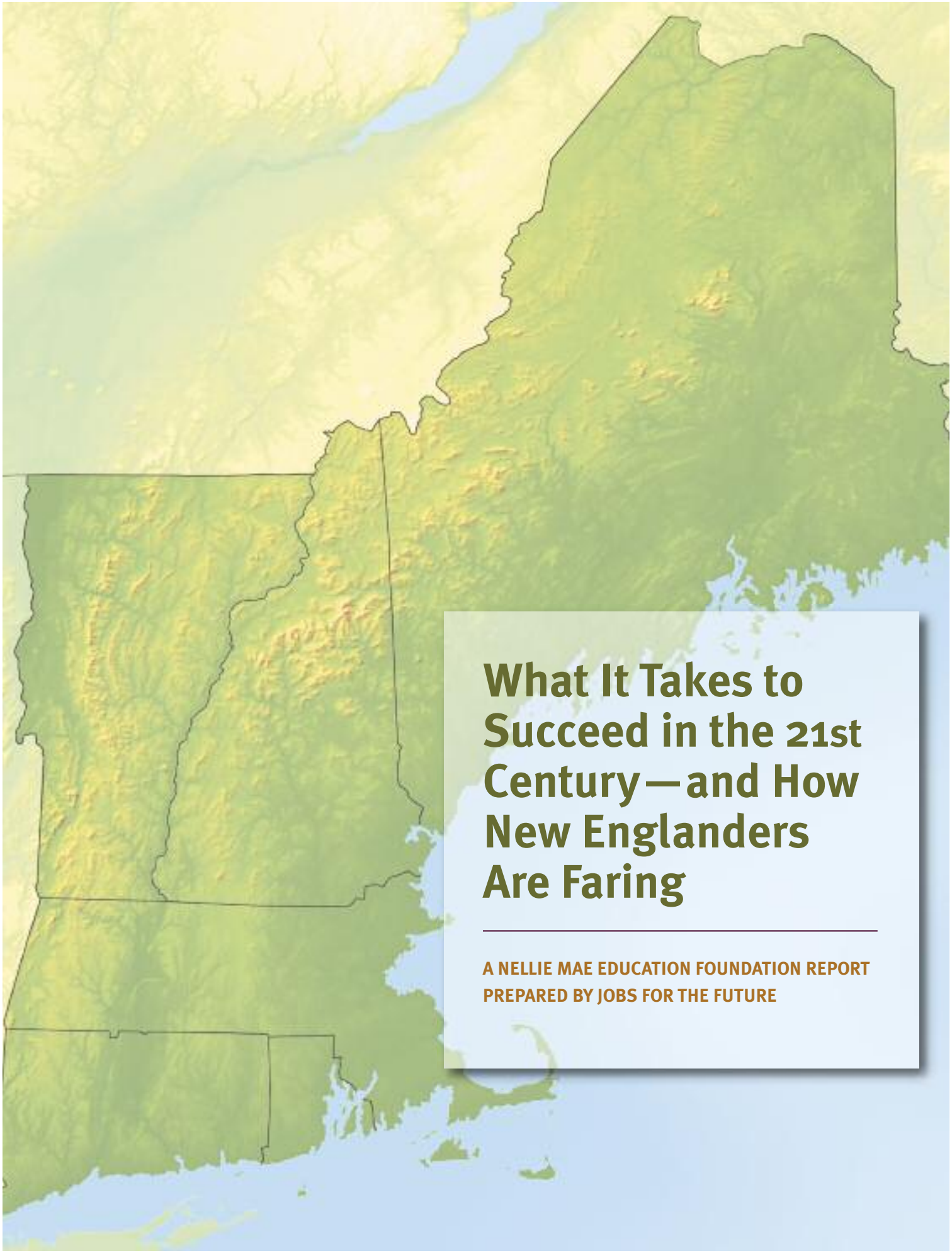

What It Takes to Succeed in the 21st Century—and How New Englanders Are Faring

A NELLIE MAE EDUCATION FOUNDATION REPORT
PREPARED BY JOBS FOR THE FUTURE

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BY JOBS FOR THE FUTURE

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Executive Summary

Who are the New Englanders of the 21st century and how are they faring in a rapidly changing society and economy? What knowledge and skills can we confidently predict will be required for future success in work and civic life? This background discussion paper, commissioned by the Nellie Mae Education Foundation, answers these complex questions through a data-rich assessment of the educational and economic prospects of New England residents—particularly those traditionally underserved by our region's educational and economic institutions—in light of rising demand for skills and knowledge across the region.

The ultimate conclusion is clear: New England, as a region whose competitive advantage nationally and internationally depends upon the skills, knowledge, and entrepreneurial instincts of its residents, cannot afford complacency.

The region's population growth is slow; new population and labor market growth are concentrated in immigrant and other groups whose educational achievement and attainment lag; educational and economic disparities are significant, by racial, ethnic, and socioeconomic status. Our educational and economic institutions have left a significant proportion of the region's population ill-prepared for advancement in education and the labor market.

In the 21st century, poor preparation for learning and for career advancement is a serious disadvantage. The skills and knowledge required to be able to make sound career choices, pursue good jobs, and adapt to economic realities have been rising steadily. A high school diploma alone cannot guarantee a path to a decent standard of living—and the lack of a high school credential makes economic hardship all but certain.

Success in today's economy requires academic skills that signal college-readiness in reading, writing, and math at a minimum. In addition, though, quality employers increasingly look for a broad set of non-academic skills: intellectual skills such as critical thinking, problem-identification and problem-solving skills; practical work-related skills such as time management, the ability to work in teams, and the ability to adapt effectively to changing work situations. A consensus has formed that the most reliable way to learn and use these skills is by earning a postsecondary credential valued by other education institutions and by employers. Postsecondary education is the gateway to advancement and success.

In this environment of rising expectations from both colleges and employers, educational institutions are under great stress and face great challenges. They must accomplish for all their students what they once only had to do well for about one-third of them: graduate young people ready for college and career. To do this will require a very different commitment to motivating and supporting all students to succeed—starting with enriched learning experiences early in their educational trajectories, creating options and programs to help those who fall behind get back on track, and making college-going culture a routine component of schooling for all youth. This will also require creative collaborations to stimulate deep innovation in how we organize and deliver educational opportunities, from early childhood through young adulthood and beyond. Collaborations need to bring together not only educational institutions but also non-school stakeholders in learning, including employers, civic leaders, community-based organizations and agencies, and government.

Demographics, Educational Outcomes, and Employment Trends

As in the country as a whole, New England's population base is becoming increasingly diverse. By 2020, minorities will comprise more than a quarter of the working-age population. Immigrant populations are on the rise, particularly in southern New England states.

New England is also becoming an older region. The number of young people entering the workforce is projected to decline, and all states in the region except New Hampshire rank among the top 15 "grayest" in the nation.

By some indicators of social welfare, New England states fare well compared to other regions. However, these relative strengths obscure serious challenges: child poverty rates hover between 12 and 18 percent across the region. Opportunity and economic advantage are unevenly distributed across states, communities, and population groups.

As New England's residents become a more diverse group, the region continues its transformation into a highly skilled, knowledge-based economy. New England has always lived by its wits and the innovative and entrepreneurial skills of its residents. This is true today as well: two New England states place among the nation's top ten on the Progressive Policy Institute's New Economy Index, which measures capacity for innovation and growth in a knowledge and innovation-based economy. Over the next decade, the region will continue to generate demand for more workers with baccalaureate and advanced degrees; at the same time, the largest segment of the region's employment base, as in other regions, will still be comprised of jobs requiring some postsecondary training and education, even if not necessarily a Bachelor's degree.

In today's increasingly complex economy many New Englanders are prospering and benefiting, but many are slipping further behind. For less-skilled workers, it is becoming more difficult to find good, steady jobs. Men, particularly those with limited education, are leaving the workforce in troubling numbers. A recent Massachusetts study shows that teen employment there, which is a strong predictor of future workforce participation, has been falling—and that black and Hispanic male teens are far less likely than their white counterparts to find summer employment.

Education attainment and achievement indicators show that important segments of the population are not prepared for success in a knowledge-based economy. The region's urban minority and immigrant populations have unacceptably low rates of academic achievement beginning in the elementary and middle school years. They lag in high school completion and achievement, and they also trail their white peers in persistence to and through college. Low-income New Englanders, no matter where they live, are far less likely to complete high school, enter and complete college, and secure family-supporting jobs and careers than are their more affluent peers.

These trends pose serious problems for the region's economic growth and vitality. New England's residents, employers, and economy cannot afford for these inequities and inefficiencies to persist or deepen.

Changing Demand for Skills and Knowledge

If more skills and knowledge are a prerequisite for educational, economic, and civic success, just which skills matter most? How important are postsecondary credentials to individual and regional productivity and prosperity?

A considerable body of research suggests that the demand for skills and knowledge is rising steadily. The wage premium for a college credential over a high school diploma has risen from 34 to 56 percent in recent decades, even as the supply of college educated workers has tripled. Occupational trends also show a steady increase in the proportion of jobs within occupational categories that require at least some college education.

The best indicator of the skills that employers want to see—in terms of academic skills and also non-academic knowledge, skills, experience, and maturity—is a postsecondary credential of some kind. A consensus has emerged that a two-year credential or its equivalent (such as a formal apprenticeship or one year of college credits plus an industry-recognized certificate) should be the minimum goal for all individuals in today's economy. A credential has a much greater

economic value—particularly in a technical field and particularly for lower-income students—than taking some college courses without obtaining the credential.

Success in the 21st century workplace and society requires a higher level of academic achievement than in the past but not only that. Individuals who advance also demonstrate and make productive use of an array of important non-academic skills, many of which are difficult to measure and not easily taught in a formal classroom setting. But they are increasingly valued by quality employers. These include skills related to problem-solving, critical thinking, communication, working in teams, and technology-related competencies. Employer surveys also suggest that creativity and the capacity to innovate are increasingly valued.

Implications for the Region's Educational and Economic Institutions

New England will rise and fall, as it has in past eras, on the ingenuity, entrepreneurship, and quality of its residents' human capital. But making sure that the stock of skills and knowledge needed for economic vitality and growth are cultivated broadly and that gaps in preparedness of different segments of the population are redressed will require significant creativity and commitment from New England's educational institutions and other stakeholders in the region's future.

The region's educational institutions are not well-equipped to help all students graduate high school ready to succeed in college and to develop additional work-related skills and knowledge valued in the labor market. Too many young people and working adults leave school academically underprepared for the new economy, particularly individuals from low-income and other traditionally underserved groups who have had weak education experiences.

A much more varied range of schools, programs, supports, and opportunities for learning, inside and outside traditional school buildings and time constraints, will be needed if the opportunity gaps facing New England residents are to be overcome. And multiple pathways to mastery of academic and other 21st century skills will be needed so that the region's young people and underprepared workers who want to advance can learn what they need to succeed in postsecondary learning and careers. New routes are needed that can help the underprepared advance quickly and efficiently from wherever they start—and enable them to meet the higher expectations of colleges and employers. This will be a major undertaking, but one that the region cannot afford to ignore.

The confluence of demographic change and rising educational and skill expectations demands a concerted effort to overcome current gaps in performance of our educational institutions before they become even more acute. This response cannot come solely from educators and schools. Rather, a long-term political and public-will campaign is needed across the region.

What is needed is a combination of *messaging* about the challenges we face, improvements and innovation in *practice* that can help more underprepared youth and adults advance and succeed, and *policy* changes that can spread and sustain more effective learning opportunities and outcomes. These can be thought of as efforts to end the *invisibility* of the most at-risk members of our society, spur a wave of *innovation and invention* of new options and models for serving struggling and underprepared individuals and enabling them to benefit from college learning, and invest in the *infrastructure* of policies and partnerships for change that can be sustained over time and lead to significant upgrading of knowledge, skills, and economic success. Philanthropic organizations can play a critical role in helping the region respond to these challenges and plan strategically to improve the educational and economic prospects of the region's residents, particularly its low-income, minority, and underprepared young people and working adults.

Part 1.
The New England Terrain

To understand the skills that New Englanders will need in the 21st century, we first must understand who lives in New England and what challenges they face. New England is becoming significantly more diverse, especially among young adults in southern New England, nearly half of whom will be minorities by the year 2020. At the same time, the number of young entrants to the workforce is expected to decline.

These workers enter a rapidly changing economy that demands advanced knowledge and skills. Massachusetts in particular is transforming into a knowledge economy at an accelerated pace. However, four years of college is not a requisite for success—jobs requiring some postsecondary training less than a Bachelor's degree will continue to comprise a majority of the region's employment base. Meanwhile, opportunities for those without education beyond high school are rapidly diminishing. Those with no postsecondary education, particularly men, are dropping out of the workforce as their employment prospects decline.

Although New England states appear to lead the nation in educational attainment, certain groups of students are not well served. Low-income, minority, and urban students are achieving at far lower rates than their peers, and in some cases the gap is more pronounced in New England than nationwide. This is particular cause for concern given that these underserved populations are growing in an economy that demands ever more skill.

The following pages provide a brief, data-rich portrait of New England today in terms of key trends in the region's demographics, economy and workforce, and residents' educational attainment and achievement.

Demographic Trends

In the years to come, minority populations and immigrants will become increasingly prominent among the people of New England.

By 2020, minorities will comprise more than a quarter of the working-age population in Massachusetts, Connecticut, and Rhode Island (Coelen & Berger 2006). The share of minorities also will increase in the northern-tier states but less dramatically so. Minority populations will be especially prominent among young workers by 2020, making up nearly half of people age 25 to 29.

New England's immigrant populations are also expected to grow rapidly. Immigrant populations have swelled since 1990 in every New England state. Over the past 25 years, the share of immigrants in the Massachusetts workforce has nearly doubled, reaching 17 percent of the total in 2004 (Sum et al. 2005).

Table 1: Minority Percentage of New England's Working-Age Population, 1990–2020

	1990	2000	2010	2020
Connecticut	17.0%	19.9%	24.1%	27.7%
Maine	2.2%	2.6%	3.2%	4.0%
Massachusetts	12.5%	15.2%	19.1%	27.7%
New Hampshire	2.9%	4.0%	5.9%	7.9%
Rhode Island	10.8%	14.2%	19.8%	25.1%
Vermont	2.0%	2.8%	4.5%	7.5%

Source: Coelen& Berger (2006)

Table 2: Minority Percentage of New England's Young Workforce Age 25–29, 1990–2020

	1990	2000	2010	2020
Connecticut	22.1%	31.0%	43.1%	47.8%
Maine	2.6%	3.9%	6.7%	8.1%
Massachusetts	15.9%	22.8%	31.9%	47.8%
New Hampshire	3.4%	7.0%	14.0%	17.1%
Rhode Island	13.9%	22.5%	37.5%	46.1%
Vermont	3.0%	4.6%	8.7%	13.4%

Source: Coelen& Berger (2006)

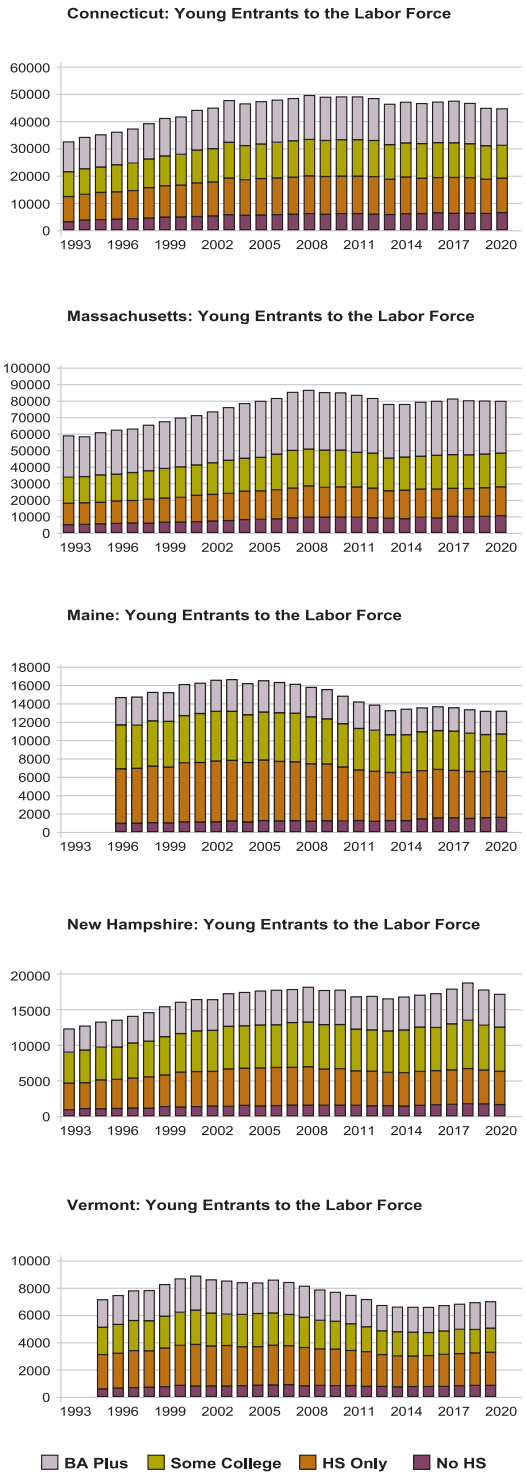
Table 3: Foreign Born, as a Percentage of the New England Population, 1990–2006

	1990	2000	2006
Connecticut	8.5%	10.9%	12.9%
Maine	3.0%	2.9%	3.2%
Massachusetts	9.5%	12.2%	14.1%
New Hampshire	3.7%	4.4%	5.4%
Rhode Island	9.5%	11.4%	12.6%
Vermont	3.1%	3.8%	3.9%

Source: U.S. Census American Community Survey (2006)

At the same time, the number of young people entering the New England workforce is projected to decrease between now and 2020.

Figure 1: Young Entrants to the New England Labor Force through 2020



Source: Coelen& Berger (2006)

This decrease reflects a general graying of the U.S. population over the next two decades as a result of longer life spans and declining fertility. New England's population in 2006 was already considerably older than the rest of the nation, with all New England states except New Hampshire ranking within the 15 "grayest" states.

Table 4: Population 65 and Older, New England, 2006

	Percent 65 or older	National Rank
Maine	14.6%	4
Rhode Island	13.9%	9
Connecticut	13.4%	12
Massachusetts	13.3%	15
Vermont	13.3%	15
New Hampshire	12.4%	31

Source: U.S. Census (2006)

Health and poverty indicators show New England states rank high among the nation, but a significant number of the region's young people are underserved.

By some indicators of social welfare, New England states are faring best in the nation. The child advocacy group Every Child Matters ranked five New England states as the top five in the nation in a child vulnerability index based on 10 measures, including child deaths, child poverty, and births to teen girls. However, a significant number of New England's young people are not well served. Eighteen percent of children live in poverty in Maine. Rhode Island places 29th in juvenile incarceration rates. Child poverty is particularly endemic among racial minority groups. In Rhode Island, 26 percent of black and Hispanic children are in poverty, compared to 7.8 percent of white children. More than two-thirds of female-headed families in Rhode Island earn less than twice the poverty level (Poverty Institute at Rhode Island College 2006).

Table 5: Measures of Social Welfare, New England, 2006

	Overall Child Vulnerability Ranking	Percent Children in Poverty	Percent Uninsured Children	Juvenile Incarceration Rate per 100,000	Births to Mothers, Ages 15–19 per 1,000
Vermont	1	13%	8%	72	21
Massachusetts	2	12%	7%	216	22
Connecticut	3	11%	6%	210	24
Rhode Island	4	15%	4%	295	33
New Hampshire	5	13%	8%	72	21
Maine	10	18%	6%	153	24

Source: Every Child Matters Education Fund; U.S. Census American Community Survey (2006)

Economic and Workforce Trends

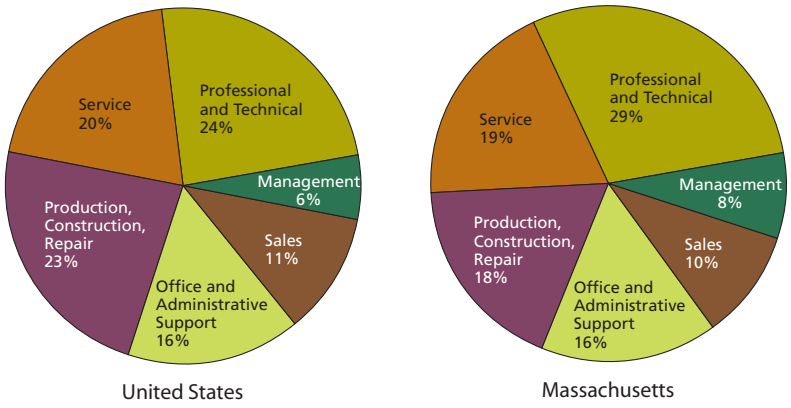
New England is becoming a knowledge-based economy composed of jobs that demand increasingly advanced skills from workers.

The extent of this transformation—and the skills workers will need to prosper within it—varies among the New England states. The economic structure of northern New England is changing in step with the nation, while southern New England—especially Massachusetts—appears to be doing so at an accelerated pace.

In contrast to the nation, for example, the Massachusetts economy is more skilled, containing a larger professional sector and fewer production jobs.

Nationwide, five of the top ten fastest-growing jobs require a Bachelor's degree, but in Massachusetts, eight of those jobs do. In contrast, Bachelor's degrees are required for only three of the fastest-growing jobs in Vermont, which will see the greatest demand for health care support workers with a moderate level of postsecondary training.

Figure 2: Differences in Job Structure, Massachusetts and the United States



Source: Massachusetts Department of Workforce Development

Table 6: Ten Fastest-Growing Jobs: Massachusetts, Vermont, and the United States

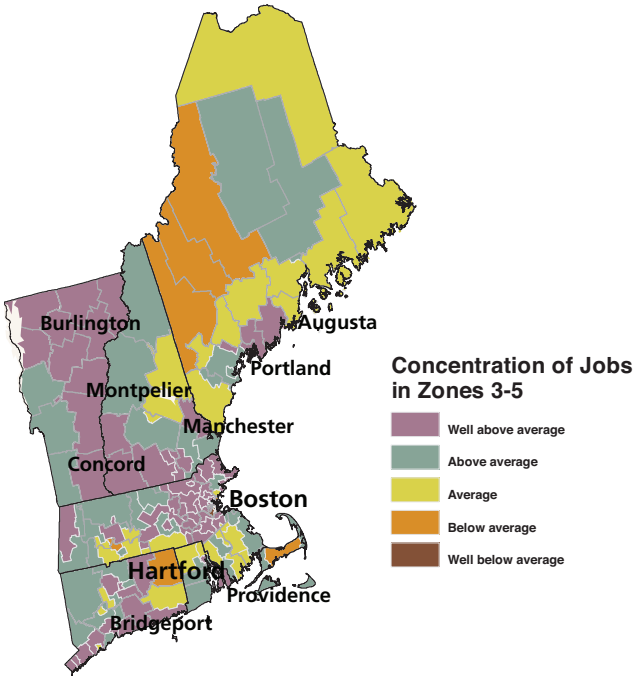
Rank	Massachusetts Jobs	Education Required	Vermont Jobs	Education required	U.S. Jobs	Education Required
1	Network systems and data communications analysts	Bachelor's degree	Personal and home care aides	Short-term on-the-job training	Network systems and data communications analysts	Bachelor's degree
2	Computer software engineers, systems software	Bachelor's degree	Network systems and data communications analysts	Bachelor's degree	Personal and home care aides	Short-term on-the-job training
3	Computer software engineers, applications	Bachelor's degree	Medical assistants	Moderate-term on-the-job training	Home health aides	Short-term on-the-job training
4	Home health aides	Short-term, on-the-job training	Physician assistants	Associate's degree	Computer software engineers, applications	Bachelor's degree
5	Biomedical engineers	Bachelor's degree	Community and social service specialists	Bachelor's degree	Veterinary technologists and technicians	Associate's degree
6	Biochemists and biophysicists	Doctoral degree	Computer software engineers	Bachelor's degree	Personal finance advisers	Bachelor's degree
7	Medical scientists, except epidemiologists	Doctoral degree	Home health aides	Short on-the-job training	Makeup artists, theatrical and performance	Postsecondary vocational award
8	Medical assistants	Moderate-term, on-the-job training	Healthcare practitioners and technical workers	Associate's degree	Medical assistants	Moderate-term on-the-job training
9	Database administrators	Bachelor's degree	Dental hygienists	Associate's degree	Veterinarians	First professional degree
10	Atmospheric and space scientists	Bachelor's degree	Social and human service assistants	Moderate-term, on-the-job training	Substance abuse and behavioral disorder counselors	Bachelor's degree

Source: U.S. Bureau of Labor Statistics, Massachusetts Department of Workforce Development, Vermont Department of Labor

Desirable jobs are heavily concentrated in southern New England, as shown on a map constructed by the Editorial Projects in Education Research Center. The map (Figure 3) shows the distribution of desirable jobs that command good wages, as defined by the Bureau of Labor Statistics. Such jobs typically require substantial education or training beyond a high school diploma.

Massachusetts, followed closely by Connecticut, leads the Progressive Policy Institute's New Economy Index, which takes into account knowledge jobs, globalization, economic dynamism, digital advances, and technological innovation. A 2007 MassINC report characterizes Massachusetts as an emerging "boutique economy," a highly specialized economy with great rewards for those with high education and skills and fewer options for everyone else (Sum et al. 2006). Meanwhile, Maine and Vermont remain more firmly rooted in old economic ways, ranking in the middle of the index.

Figure 3: This map displays the percentage of desirable jobs within local geographical areas. Desirable jobs are defined as occupations falling in Jobs Zones 3 through 5, as defined by the Bureau of Labor Statistics.



*Source: EPE Research Center analysis of civilian labor-force data from the 2005 American Community Survey (U.S. Census Bureau) and occupational characteristics from O*NET (Bureau of Labor Statistics). Retrieved May 27, 2008 at: www.edweek.org/media/ew/dc/2007/40jobs-map-large.pdf.*

Table 7: New England in the New Economy

	New Economy National Rank
Massachusetts	1
Connecticut	7
New Hampshire	15
Rhode Island	21
Maine	25
Vermont	28

Source: Progressive Policy Institute (2002)

Over the next decade, jobs requiring postsecondary training but not a Bachelor's degree will continue to comprise the largest part of New England's employment base.

Despite growing demand for specialized skills, there is still a significant need for workers with moderate skills. Middle-skilled jobs—those requiring more than a high school diploma but less than a four-year degree—are projected to make up roughly half the labor market in the three northern-tier states through 2014, while less than a third of jobs will require four or more years of college.

Table 8: New England Jobs, by Skill Level, 2004 and 2014

	High Skill		Middle Skill		Low Skill	
	2004	2014	2004	2014	2004	2014
Connecticut	33%	34%	48%	46%	19%	20%
Maine	29%	30%	49%	47%	22%	23%
Massachusetts	36%	38%	45%	42%	19%	20%
New Hampshire	30%	32%	51%	49%	19%	19%
Rhode Island	31%	33%	48%	45%	21%	22%
Vermont	29%	30%	50%	48%	21%	22%

Source: Skills2Compete.org

Many of these middle-skilled jobs, such as registered nurse, truck driver, or carpenter, pay enough to support a family. Meanwhile, low-skilled jobs are fairly limited in number and garner low wages. Thus, while significant numbers of people will not need a Bachelor's degree to attain a satisfying career, nearly everyone will need postsecondary training.

Table 9: Examples of High-Demand, Middle-Skilled Jobs in New Hampshire

	2006 Median Annual Earnings
Registered nurse	$54,400
Truck driver	$35,500
Auto mechanic	$35,700
Carpenter	$35,900
General maintenance and repair worker	$32,600

Source: Skills2Compete.org

Other data analyzed for New Hampshire also suggest that workers will need substantial skills associated with knowledge and service jobs. Using descriptors from the Standard Occupational Classification system, New Hampshire projects demand to 2014 will grow most for reading comprehension, active listening, speaking, and writing skills, as well as customer and personal service, English language, clerical, and mathematical knowledge. Jobs that require workers to maintain relationships and learn on the job are projected to grow significantly.

Table 10: New Hampshire Top Projected Skill Demands, 2014

Skills	Knowledge	Work Activities
Reading comprehension	Customer and personal service	Establishing and maintaining interpersonal relationships
Active listening	English language	Getting information needed to do the job
Speaking	Clerical	Communicating with supervisors, peers and subordinates
Writing	Mathematics	Organizing, planning and prioritizing work
Critical thinking	Education and training	Updating and using job-relevant knowledge

Source: Bartlett &Josten (2006)

As a result of these economic trends, men, particularly those with limited education, are leaving the workforce.

A large number of Massachusetts's male workers, especially those with limited education, have stopped working and are not actively looking for work (Sum et al. 2006). Workforce participation fell for Massachusetts workers with every level of education from 1990 to 2000, but most markedly for men with a high school diploma or less, as the state's economic structure shifted from goods-producing to service-providing. As options for unskilled workers decrease across the region, those already at the bottom of the economic ladder will enjoy fewer prospects.

Table 11: Trends in the Labor Force Participation Rates, Massachusetts 16- to 64-year-olds, Percentages by Gender and Educational Attainment, 1990-2000 (excluding students)

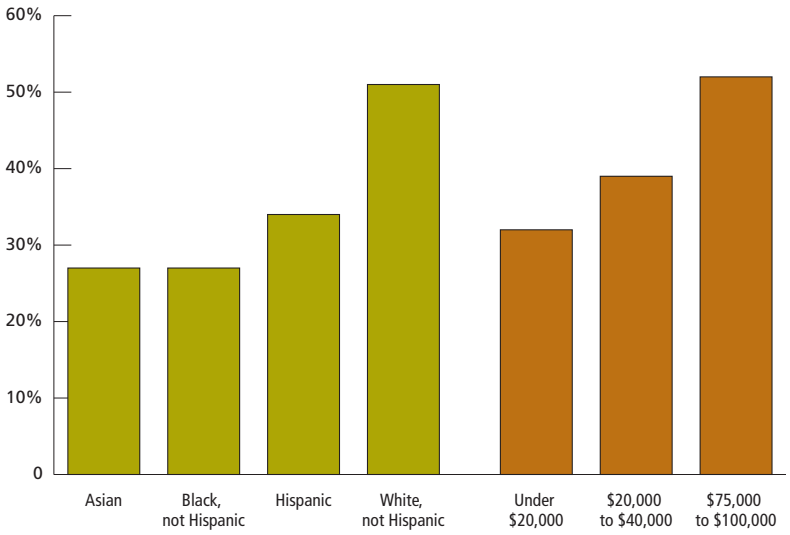
	Men		Women	
	1990	2000	1990	2000
No high school diploma	75.8%	65.5%	53.5%	51.9%
High school diploma/GED	89.6%	82.9%	71.4%	69.6%
13–15 years	91.9%	88.2%	79.2%	77.8%
Bachelor's degree	95.5%	93.6%	83.3%	81.1%
Master's degree or higher	96.2%	94.4%	88.5%	85.6%

Source: Sum et al. (2006)

Teen employment, a predictor of future workforce participation, has been falling in Massachusetts.

The Center for Labor Market Studies at Northeastern University characterizes teen employment as an initial foothold into the labor market. Somewhat counter-intuitively, the likelihood that teens age 16-19 will work during the summer months increases with their family income (Sum, McLaughlin, & Khatiwada 2006). Teen summer employment rates vary significantly by racial and ethnic group; white teens are nearly twice as likely as black or Asian-American teens to work in the summer.

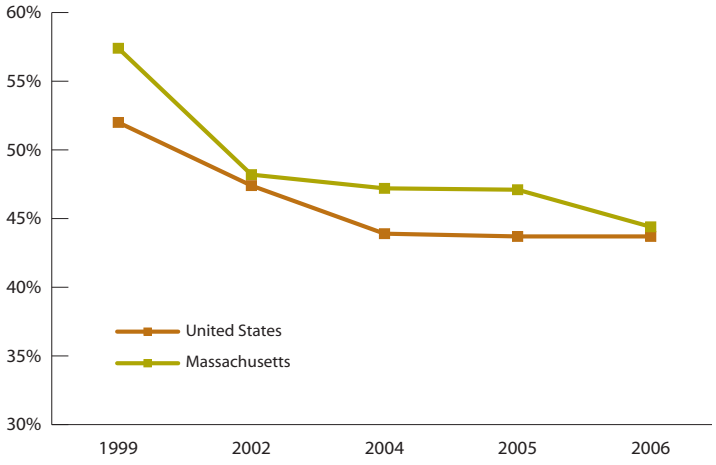
Figure 4: Summer 2006 Employment Rates, U.S. Teens, by Race-Ethnic Group and Selected Family Income



Source: Sum, McLaughlin, & Khatiwada (2006)

State-specific data is available in Massachusetts, where the teen employment rate is higher than nationwide. However, the state's share of working teens has declined steadily since 1999. Teen employment programs present one opportunity to enhance the early work experiences of the region's underserved youth.

Figure 5: Teen Employment Rates, Massachusetts and the United States, 1999–2005



Source: Sum et al. (2007)

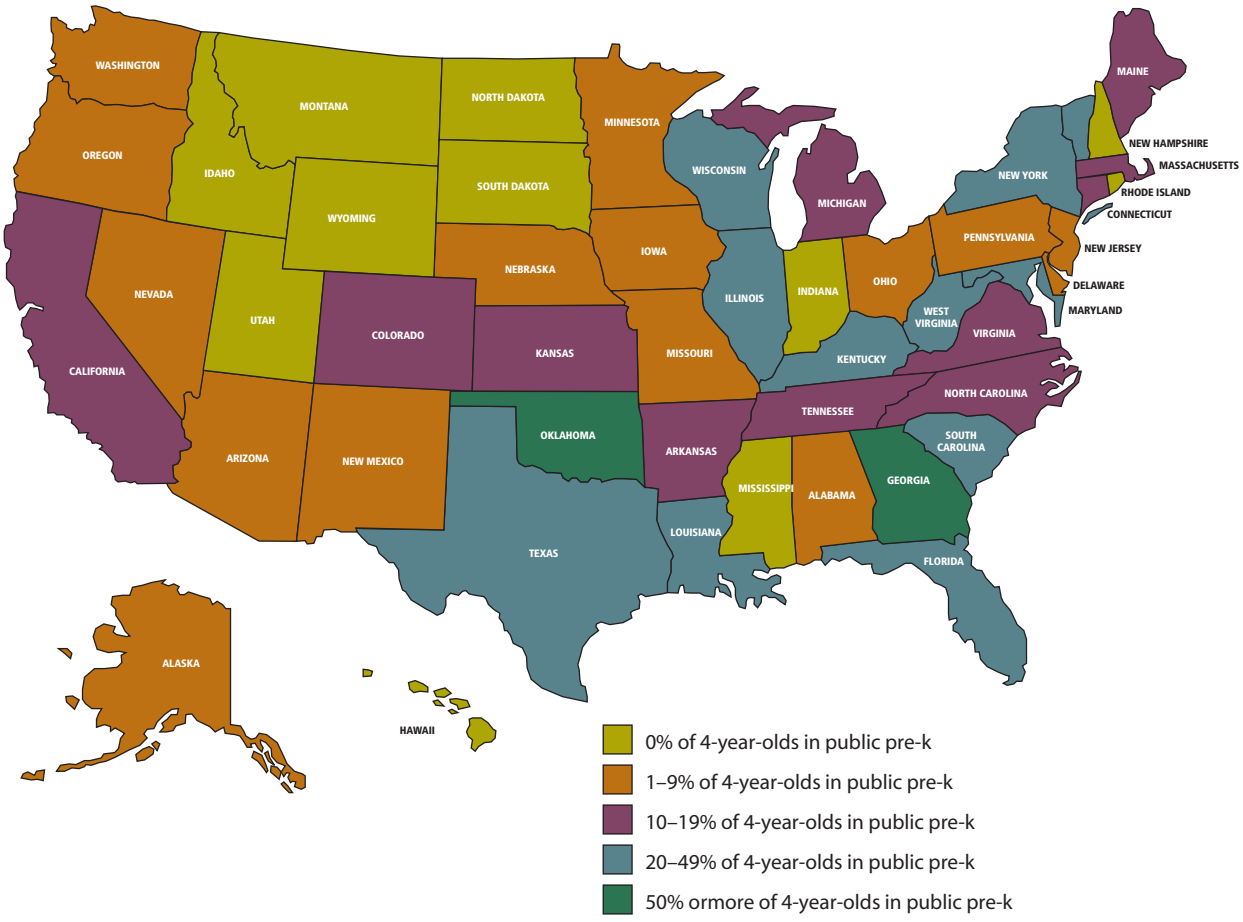
Education Trends

New England's young children have limited access to early childhood education and care.

State education-funded pre-kindergarten is most widely available in Vermont, where 45 percent of four-year-olds are enrolled in a state-funded pre-K program. The other New England states trail the national average of 22 percent. Sixteen percent of four-year-olds are enrolled in Maine and Connecticut and 10 percent in Massachusetts, while Rhode Island and New Hampshire are two of the twelve states that offer no such programs.

Figure 6: Availability of Pre-Kindergarten Programs

This map illustrates the wide-ranging disparity in pre-K availability among the 50 states and the District of Columbia. Certain states—Oklahoma and Georgia, for example—offer their four-year-olds extensive opportunities to participate in pre-K, while other states—such as Rhode Island and New Hampshire—offer no state-funded pre-K services.



National Institute for Early Education Research, Rutgers University, New Brunswick, N.J. Map data exclude four-year-olds served by federally-funded Head Start or special education programs. State percentages are based on 2006–07 enrollmnt as a percentage of total state population of four-year-olds. Source: www.preknow.org/resource/mapping/accessmap.cfm

Table 12 further illustrates the limits of state-funded pre-K. Of young children attending school, those enrolled in a public program make up a small proportion, which suggests that access to formal preschool in New England depends significantly on ability to pay.

Federal Head Start programs for low-income children and special education programs serve a small portion of New England preschoolers.

Table 12: Young Children Enrolled in School, Overall and in Public Programs

	3- and 4-Year-Olds Enrolled in Preschool	4-Year-Olds Enrolled in State-Funded Pre-K
Connecticut	61%	16%
Maine	44%	16%
Massachusetts	60%	10%
New Hampshire	51%	0%
Rhode Island	52%	0%
Vermont	49%	45%
Nation	49%	22%

Source: Barnett et al. (2007)

Table 13: Estimated 2006-07 Enrollment of New England 3- and 4-Year-Olds in Head Start and Special Education, as a Percentage of All 3- and 4-Year Olds

	Head Start		Special Education	
	4-year-olds	3-year-olds	4-year-olds	3-year-olds
Connecticut	8.2%	6.5%	5.9%	3.2%
Massachusetts	7.8%	6.1%	7.2%	4.9%
Maine	13.1%	8.7%	11.3%	7.7%
New Hampshire	5.5%	3.7%	6.5%	5.1%
Rhode Island	11.6%	4.6%	8.4%	5.6%
Vermont	10.0%	8.8%	8.8%	6.4%

Source: Barnett et al. (2007)

Another significant source of support is child care spending, funded largely through the federal Child Care and Development Fund, which promotes school readiness for low-income children. State data suggest that demand for child care far exceeds resources. In Massachusetts, 36,260 babies, toddlers, and preschoolers receive state-subsidized child care, while another 12,663 remain on waiting lists (Massachusetts Department of Early Education and Care 2008). Vermont estimates that overall capacity in regulated child care can meet only 50 percent to 60 percent of estimated need (Vermont Agency of Human Services). And in Connecticut in 2005-06, parent requests for child care placement increased 30 percent from the previous year. Of those inquiries, 65 percent were for infant, toddler, or preschool care (Connecticut Department of Social Services 2006).

These measures, although a partial picture of the multifaceted landscape of support for the development of young children, suggest that significant numbers of New England's underserved children lack access to any kind of formalized early childhood education and care.

Results from the 2007 National Assessment of Educational Progress reveal sizeable racial and income achievement gaps in the middle grades.

Only half (51 percent) of Massachusetts eighth graders scored proficient or above in math—compared with an even lower average of 31 percent nationwide—but that share falls to 25 percent for low-income students, 19 percent for Hispanics, and a dismal 13 percent for black students. Math proficiency for Rhode Island eighth graders was at 38 percent, with proficiency rates in the single digits for blacks and Hispanics.

Table 14: New England Public School Performance, NAEP Grade 8 Mathematics, 2007 (percent at or above proficient)

	All	White	Black	Hispanic	Asian/Pacific Islander	Low-income
Connecticut	34%	44%	7%	10%	61%	24%
Maine	34%	35%	—	—	—	21%
Massachusetts	51%	58%	13%	19%	74%	25%
New Hampshire	38%	39%	—	14%	—	18%
Rhode Island	28%	35%	9%	7%	31%	10%
Vermont	41%	42%	—	—	—	24%
Boston	27%	58%	12%	20%	57%	21%
Nation	31%	42%	11%	15%	50%	15%

Source: U.S. Department of Education (2007)

Nearly a quarter of New England's children are unsupervised after school.

School-based measures of educational success illuminate the needs and challenges facing the region, but the picture is far from complete. Outside of school, tremendous opportunities for learning exist. In New England, only 14 percent of school-age children participate in structured after-school programs, and 22 percent are alone and unsupervised during the hours after school (Afterschool Alliance 2006).

Minority and low-income youth are completing high school at very low rates, and the white-Hispanic gap is wider in New England than nationwide.

Even though New England states are graduating students from high school at rates that are higher overall than the national average, some groups in the region are faring quite poorly. Graduation rates calculated by the Editorial Projects in Education Research Center show minority and low-income populations in New England are graduating at especially low rates; this is particularly the case for Hispanics, who do worse than Hispanics nationwide. Girls outpace boys significantly in high school completion.

Table 15: Graduation Rates in New England, by Gender and Race, 2003–04

	All	Male	Female	Asian/Pacific Islander	Hispanic	Black	White
Connecticut	79.8%	75.9%	82.9%	79.3%	45.5%	54.8%	85.5%
Maine	76.2%	73.4%	77.4%	57.2%	—	—	76.1%
Massachusetts	73.2%	69.8%	76.4%	70.1%	37.4%	47.9%	76.8%
New Hampshire	76.0%	—	—	—	—	—	—
Rhode Island	70.6%	66.0%	74.8%	53.7%	54.4%	57.2%	74.3%
Vermont	81.0%	71.0%	76.6%	77.7%	—	—	80.9%
Nation	69.9%	66.0%	73.6%	80.2%	52.3%	46.2%	72.3%

Source: Editorial Projects in Education Research Center

Table 16: Graduation Rates in Urban, Rural, Suburban, and High-Poverty School Districts, 2003–04

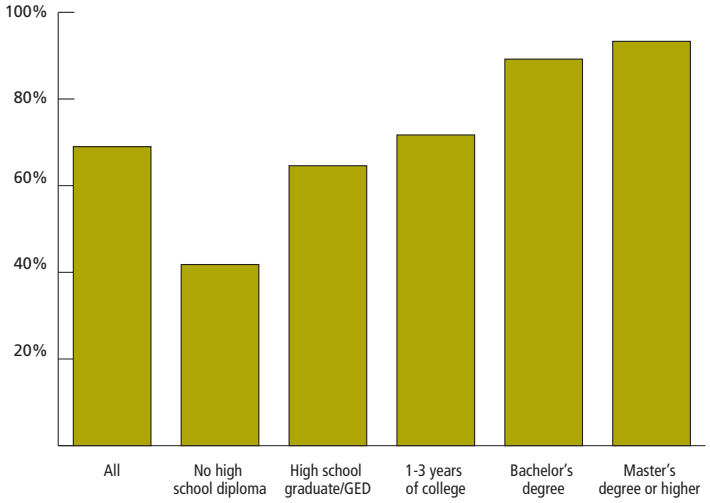
	Urban Districts	Rural Districts	Suburban Districts	High-Poverty Districts
Connecticut	60.6%	82.3%	81.8%	Not available
Maine	66.1%	74.3%	75.4%	68.3%
Massachusetts	55.3%	77.2%	77.8%	49.1%
New Hampshire	70.8%	75.5%	72.4%	64.8%
Rhode Island	69.3%	74.8%	75.3%	69.5%
Vermont	59.4%	77.1%	75.7%	59.1%
Nation	57.5%	71.9%	72.7%	57.6%

Source: Swanson (2004)

Urban areas show concentrations of problems with high school completion.

Urban students in New England graduate from high school at far lower rates than their suburban and rural counterparts. In Boston, as many as a third of students do not graduate from high school (Boston Youth Transitions Task Force 2006). This is especially alarming because the prospects for dropouts in Boston are grimmer than almost anywhere else. Boston ranks 44th out of the 50 largest central U.S. cities for employment among young dropouts (Khatiwada, McLaughlin, & Sum 2005).

Figure 7: Employment Rate, Boston 16- to 24-Year-Olds Not in School, by Educational Attainment, 2000



Source: Khatiwada, McLaughlin, & Sum (2005)

Table 17: Percent of Dropouts, Age 16–19, Who Were Employed in 50 Largest U.S. Cities, 2000

	Rank	City	Employment rate
TOP 10 CITIES	1	Austin, TX	55.5%
	2	Colorado Springs, CO	54.8%
	3	Mesa, AZ	54.3%
	4	Omaha, NE	53.1%
	5	Charlotte, NC	52.7%
	6	San Jose, CA	51.3%
	7	Nashville-Davidson, TN	50.7%
	8	Dallas, TX	50.0%
	9	Portland, OR	49.7%
	10	Seattle, WA	49.0%
BOTTOM 10 CITIES	41	Detroit, MI	31.7%
	42	Fresno, CA	31.3%
	43	El Paso, TX	30.7%
	44	**Boston, MA**	**30.1%**
	45	New York, NY	29.7%
	46	St. Louis, MO	28.8%
	47	Miami, FL	27.4%
	48	Philadelphia, PA	25.8%
	49	Baltimore, MD	24.2%
	50	New Orleans, LA	21.7%

Source: Khatiwada, McLaughlin, & Sum (2005)

High school students in southern New England lead the nation in rigorous coursework, while students in the northern states leave high school less well prepared.

The relative disadvantage of Boston dropouts is unsurprising in light of the competitive academic environment of southern New England. Massachusetts and Connecticut rank high in terms of preparing students for college, while New England's northern-tier states lag. Two-thirds of students in Massachusetts and Connecticut take upper-level math in their senior year, compared to just over a third in Vermont. Massachusetts and Connecticut also lead the nation in the share of students who score 3 or higher on Advanced Placement exams; Rhode Island, Vermont, Maine, and New Hampshire trail far behind.

However, even in the leading states, a disproportionate number of students from underserved populations leave high school ill-prepared for college and work. In the Connecticut high school Class of 2007, only 5.8 percent of those taking Advanced Placement exams were black, though black students made up 12 percent of the class. Likewise, in Rhode Island, Hispanics made up 14.7 percent of the Class of 2007 but just 4.1 percent of those taking Advanced Placement exams (College Board 2007).

Table 18: Measures of Rigor, 2006

	Twelfth Graders Taking at Least One Upper-Level Math Course	Number of Scores in the Top 20% Nationally on SAT/ACT per 1,000 High School Grads	Number of Scores 3 or Higher on an AP Test per 1,000 High School Juniors and Seniors
Connecticut	68%	234	217
Maine	Not available	161	129
Massachusetts	66%	253	210
New Hampshire	Not available	217	99
Rhode Island	Not available	157	106
Vermont	38%	189	150
Best states	66%	237	217

Source: National Center for Public Policy and Higher Education (2006)

New England ranks high in terms of Bachelor's degree completion, but Associate's degree attainment is weak, and college participation is poor among low-income and minority students.

The five lower New England states are among the best in terms of students who complete Bachelor's degrees. On the other hand, with the exception of Maine, New England has lagged in the conferring of Associate's degrees. All of the five lower states trail Maine in persistence of community college students. This difference could in part reflect the differing structure of the Maine economy, in which middle-skill jobs are more prevalent.

Again, New England's relatively high rates of degree attainment should not obscure the fact that large numbers of students from underserved populations do not have access to higher education. Among young adults age 18 to 24 in Massachusetts, the gap in college participation between whites and other ethnic groups is substantial. In 2006, 39 of 100 white young adults were enrolled in college, compared to 28 of 100 young adults from other ethnic groups. Young adults from high-income families in Massachusetts are about twice as likely as those from low-income families to attend college (National Center for Public Policy and Higher Education 2006).

Table 19: College Persistence and Completion in New England, 2006

	First-Year Community College Students Returning Their Second Year	Freshmen at Four-Year Colleges Returning Sophomore Year	First-Time, Full-Time Students Completing Bachelor's Within Six Years	Certificates, Degrees and Diplomas Given at All Colleges per 100 Undergrads
Connecticut	51%	82%	62%	16
Maine	62%	75%	56%	16
Massachusetts	53%	83%	67%	18
New Hampshire	58%	79%	64%	20
Vermont	46%	79%	63%	19
Rhode Island	54%	81%	64%	20
Top states	62%	82%	64%	20

Source: National Center for Public Policy and Higher Education (2006)

Likewise, college completion rates are bleak for those from underserved populations. Table 20 shows significant disparities in degree attainment between white students and underrepresented minorities at New England's flagship public universities. Although troubling, college completion rate disparities are actually worse. The flagship universities have higher graduation rates than less selective two- and four-year public colleges and universities, which tend to enroll higher proportions of minority students.

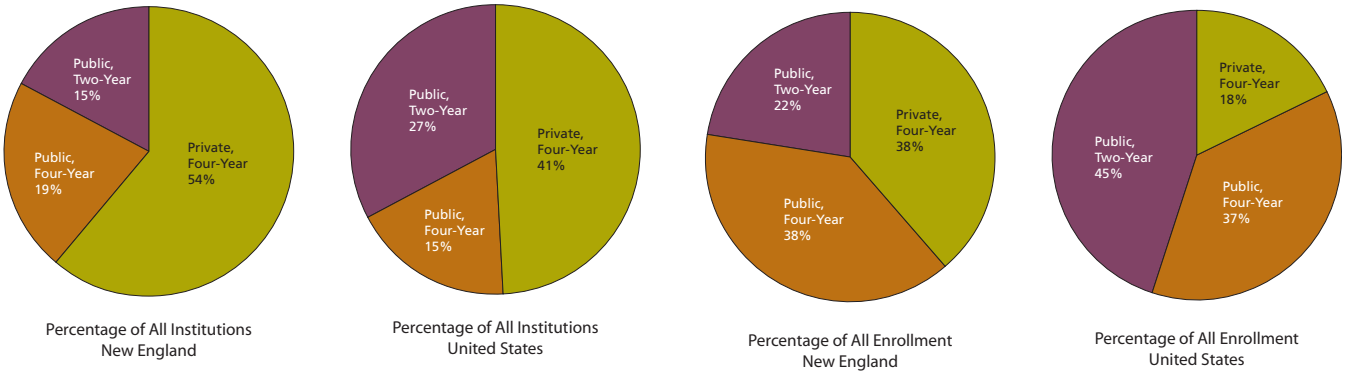
Table 20: Six-Year Graduation Rates at New England's Flagship Public Universities

Flagship Public University	Overall Graduation Rate	White Graduation Rate	Underrepresented Minority Graduation Rate
University of Connecticut	72%	73%	63%
University of Maine	53%	54%	37%
UMASS Amherst	66%	68%	57%
University of New Hampshire	73%	74%	69%
University of Rhode Island	56%	58%	44%
University of Vermont	65%	65%	63%

Source: Gerald & Haycock (2006)

Currently, four-year colleges dominate the higher education sector in New England. More than three-quarters of New England's college students were enrolled in four-year institutions in 2004, while 22 percent were at two-year colleges.

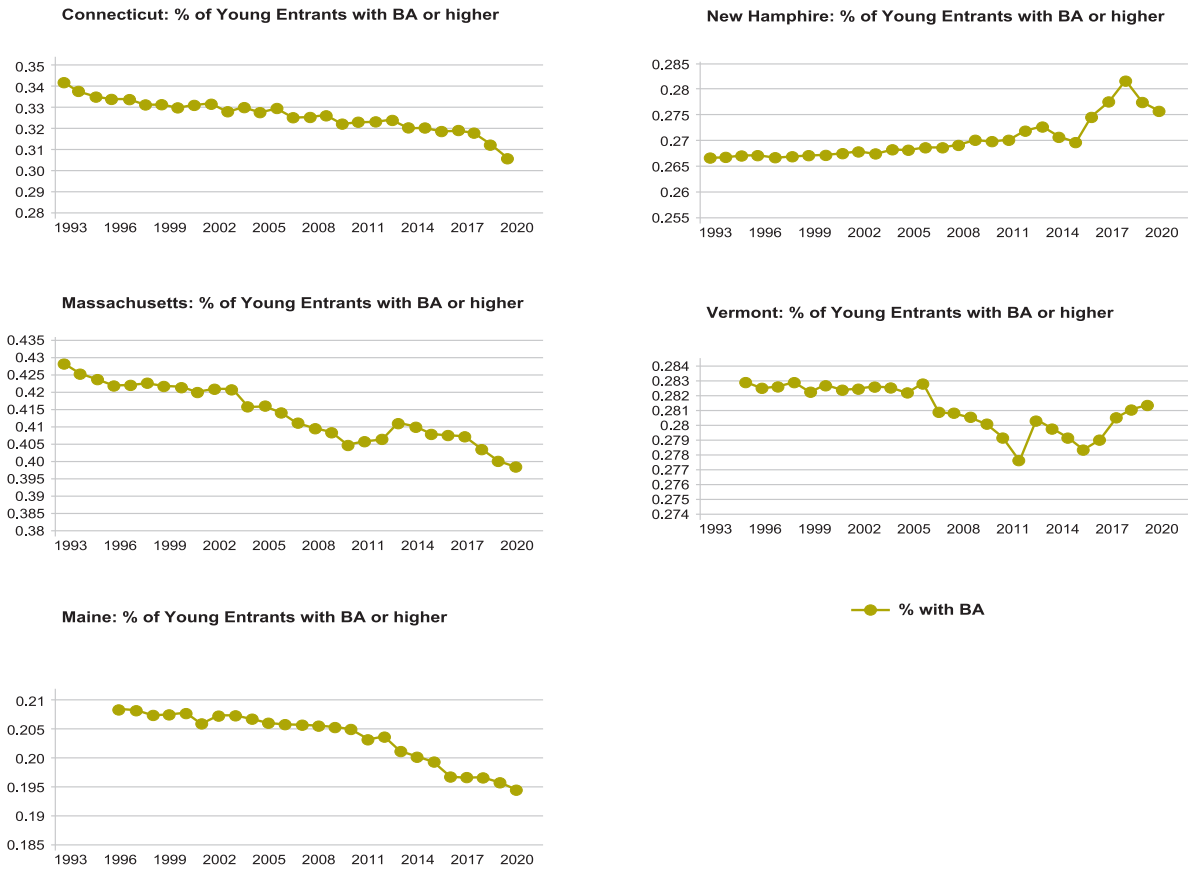
Figure 8: Percentage of Postsecondary Institutions and Enrollment by Sector, New England and the United States, 2004



Note: Excludes institutions in other categories, such as proprietary insitutions.
Source: Couturier & Cunningham (2006).

In years to come, however, projections suggest that among young entrants to the workforce, the percentage who hold a Bachelor's degree or higher will decline in every New England state, with the possible exception of New Hampshire. This prediction emphasizes the need to strengthen pathways to Associate's degrees and certificates, many of which will continue to lead to jobs that pay well.

Figure 9: Educational Attainment of Young Entrants to the New England Workforce through 2020



Note: Data for Rhode Island not available.
Source: Coelen & Berger (2006)

Participation in adult education is inadequate to meet the need or demand.

The vast majority of adults who lack the basic skills to advance in careers and education are not connected with adult education. The participation rate is particularly poor in Massachusetts, where those who need training are enrolled in basic adult education and English as a Second Language at roughly half the rate of the nation. Even in Maine, where participation rates are relatively high, fewer than a third of adults who lack English proficiency are enrolled in formal language classes.

Table 21: Enrollment in State Basic Adult Education Programs per 1,000 Adults Age 18–64 with Less than a High School Diploma, 2005

Connecticut	152.9
Maine	112.6
Massachusetts	53.7
New Hampshire	79.3
Rhode Island	79.0
Vermont	61.2
Nation	101.7

Source: Council for Adult and Experiential Learning (2008)

Table 22: GEDs Awarded per 1,000 Adults Age 25–44 with Less than a High School Diploma, 2005

Connecticut	8.9
Maine	16.0
Massachusetts	7.5
New Hampshire	10.8
Rhode Island	7.0
Vermont	7.0
Nation	8.7

Source: Council for Adult and Experiential Learning (2008)

Table 23: Enrollment in English as a Second Language per 1,000 Adults Age 18–64 with Little or No English Proficiency, 2006

Connecticut	159.5
Maine	305.8
Massachusetts	59.3
New Hampshire	190.3
Rhode Island	82.8
Vermont	241.0
Nation	113.8

Source: Council for Adult and Experiential Learning (2008)

Summary

By many indicators, too many members of New England's minority, urban, low-income, and immigrant populations are not thriving academically. They are well behind by middle school and are graduating high school and college at unacceptably low rates. These disparities are even more troubling considering that New England is expected to grow remarkably more diverse in coming years, while its economy demands increasingly higher skills. For both their personal success and the region's future prosperity, these young people must be equipped with a richer set of knowledge and skills.

Part 2. What Knowledge and Skills Are Needed for Success in a Global Economy?

What knowledge, skills, and dispositions are most important in preparing New England residents for success in a increasingly complex, innovation- and knowledge-driven global economy? Researchers agree that an engaged, productive individual must be equipped to:

- Succeed in postsecondary education and continued learning throughout one's life, both formally and informally;
- Contribute effectively in a competitive, fast-changing work environment; and
- Meet broader responsibilities as a citizen of an increasingly global society.

There is no shortage of recommendations and policy prescriptions for how the nation—and New England—should respond to the challenges implicit in this vision of the future. Business and education groups, government commissions, researchers, and many others have weighed in on what success in the 21st century demands—and how New England and other regions can get there. What emerges from the spate of recent reports and analyses is a broad consensus that we distill in this section.

We conclude from research that a postsecondary education credential of some kind is the minimal requirement for success in the 21st century economy—and that success requires a combination of academic, conceptual, and practical knowledge and skills that form an integrated package. With greater demand for a more diverse variety of knowledge and skills, particularly in workplaces that pay decent wages or provide clear ladders to better opportunities, the stakes for all individuals are getting higher, whether they are just preparing to enter the workforce or have been there for some time. The minimum expectations for academic basics and for other skills that make for productive, creative employees are rising, and the relationship between economic prospects and postsecondary educational credentials is tightening.

The increasing demand for skills and knowledge has an impact on individuals across the economy—and it places demands upon institutions of education and employment. New England is competing against other states and internationally, based increasingly upon the stock of human capital available to existing employers and to entrepreneurs eager to create new ventures and institutions. Most significant, the ratcheting up of skill and knowledge expectations poses a serious risk to those from population groups typically underserved by our educational institutions. They risk falling further behind and being caught on the wrong side of the education divide if our region's private, public, and nonprofit leaders fail to respond to the need for ambitious and varied skill development efforts that can help people advance from where they are toward what they need, quickly and efficiently, through both traditional and other learning institutions and contexts.

21st Century Knowledge and Skills—Trends and Bottom Lines

The late 20th and early 21st centuries mark the transformation of the global economy to what has been referred to, somewhat interchangeably, as the *knowledge society*, the *information age*, or the *innovation economy*. In this new world, competitive pressures, technological change, and market deregulation have put a premium on speed, flexibility, and the ability to innovate continuously and boldly. To survive, organizations must be able to adapt nimbly and transform themselves in response to external pressures. Work in general, not just that of high-technology enterprises, is organized differently than in the past, and these new forces require higher levels and a broader range of academic and non-academic skills and knowledge.

Preparation for a rapidly changing economy requires high levels of educational attainment—including a postsecondary credential.

The demand for skills and knowledge is rising steadily, although that increase is modest in any given year.

The world of work in 2008 and beyond requires more education. Numerous government and private-sector studies conclude that many more jobs will require some postsecondary education than in the past. Postsecondary credentials—at the baccalaureate and graduate levels, but also Associate's degrees and industry-recognized credentials—will be increasingly necessary for entrance into jobs and careers with wages that can keep families in the middle class. The long-term trend is unmistakable.

Americans have recognized the importance of more formal education and they have both demanded and responded to expanded educational opportunities. High school completion rates increased from less than 10 percent at the turn of the last century to between 70 and 75 percent by the 1950s (National Research Council 2000; Alliance for Excellent Education 2008). As recently as 1960, more than half of prime-age workers (ages 30-59) had not finished high school, and fewer than one in ten had received a Bachelor's degree. By the late 1990s, only 11 percent had not finished high school or received a General Equivalency Diploma (GED); 28 percent had at least a Bachelor's degree; and an additional 28 percent had at least some postsecondary education (Carnevale 2003). The proportion of all workers who are college educated tripled between 1960 and 2005.

Consider how the distribution of educational attainment within particular occupations has changed in recent decades. For example, in 1973, 63 percent of office workers had only a high school diploma or less and another 17 percent had some college up to an Associate's degree; by 2001, the percentage of office workers with a high school diploma or less had dropped to 31 percent, and the percentage with an Associate's degree or some college had climbed to 31 percent. In low-wage service jobs, the percentage of workers with a high school diploma or less dropped from 86 percent to 61 percent, while those with some college through an Associate's degree rose from 9 to 26 percent (Carnevale and Rose 1998). While less pronounced, the trend also has been true in manufacturing.

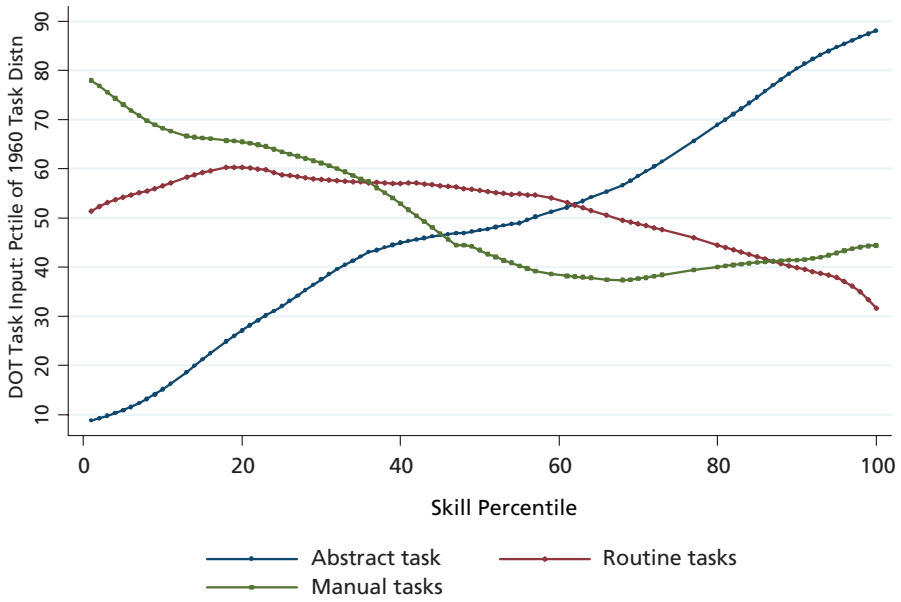
Of course, a better-educated workforce might not be a workforce with the skills and knowledge needed to succeed in today's economy. An increase in educational attainment can result in an oversupply of qualified workers if the demand for skill is not rising at least as quickly. However, there has indeed been a significant increase in the demand for more skilled workers in recent decades. Data on the wage premium that goes to college-educated workers provide strong evidence for this trend. If the wage differential between college-and high school-educated workers had narrowed as the supply of college-educated workers tripled, there would be reason to believe that supply was outstripping demand and that a college credential was not really critical to economic success. This has not been the case: wages for college-educated workers rose significantly during most of the period. In 1979, the median hourly wage of college-educated workers was 34 percent higher than that of high school-educated workers. By 2005, the advantage to the college-educated reached 56 percent (Lerman 2008).

This data is suggestive but should be interpreted with caution: long-term supply and demand trends are still only trends; they are not automatically sustained. In the 1970s, the supply of college-trained labor outstripped demand, and the wage premium has changed little in the past few years (Osterman 2008). Moreover, wage trends alone are a proxy for whether the demand for productive skills and knowledge is indeed increasing.

Bureau of Labor Statistics occupational trends and projections reinforce the conclusion that skill demands are rising steadily. Without going into methodological debates, the general conclusion from government occupational projections is that there is a steady, modest trend toward more jobs that require at least some college education. Projections for the next decade point to the continuation of this trend. The projections actually may understate the case, because they include all jobs in the economy, including those held by young people. If youth jobs (where skills and knowledge requirements are typically lower) are excluded, then the shift to jobs with greater educational and skill requirements appears more rapid (Osterman 2008).

Trends in work organization and technology point to important sources of increased demand for more education that are unlikely to be reversed. Paul Osterman's research on "high performance work organizations" has shown rapid diffusion of these workplace practices in the 1990s, changes that demand higher levels of education and skill from workers. The diffusion of computer technology is having a powerful impact on the distribution of demand for skill across the economy. Computers directly substitute for the routine tasks found in many traditional middle-wage jobs and most strongly complement the non-routine, abstract cognitive tasks of high-wage jobs *(see Figure 10)*. Economist David Autor and his colleagues (forthcoming) argue that this shift in the skills required to perform different jobs and in the mix of jobs available in the economy pushes employment opportunity toward those with more education, which exacerbates the economic divide between the haves and have-nots.

Figure 10: Task Intensity by Occupational Skill Percentile, Defined as Occupations' Rank (in Percentiles) in Mean Years of Schooling



Source: Autor, Katz, & Kearney (forthcoming)

A postsecondary credential appears to be the gateway to economic opportunity and success. The two-year degree is both an important threshold credential for individuals and a recognized signal to employers of readiness to succeed in mid-skilled employment.

The view that skills and knowledge requirements have risen to the point that a high school diploma is no longer adequate for economic success is often called the "college for all" argument. This view is widely accepted by researchers and should be embraced by policymakers, although with important qualifications and caveats. A summary of the evidence can be distilled as follows:

- College credentials matter and the credential itself has real economic value. Moreover, credentials matter particularly as a route to economic advancement for youth and adults from low-income families and underserved communities.
- Degree attainment does not guarantee cognitive skill increases: at least at the level of international comparisons, according to economist Eric Hanushek and his colleagues (2008), economic growth is more consistently explained by increased cognitive skills (as measured on international tests) than by the average postsecondary attainment of a nation's residents. The quality of post-secondary learning matters.

- Some researchers predict a shortage of baccalaureate degree holders in the years ahead. However, "college" is not synonymous with "baccalaureate." While a Bachelor's degree confers an additional premium in the labor market, an effective two-year college sector is becoming increasingly important to regional economic vitality and individual economic success.
- Postsecondary attainment and credentials are not the only determinants of income and of the likelihood of low-income individuals and families escaping poverty. Other policies—improved child and maternal health care, minimum wage increases, easier unionization, earned income tax credits—are also important strategies for improving the prospects of low-income Americans and reducing income inequality. However, given U.S. political realities and culture, efforts to expand access to and success in higher education resonate with the public and with policymakers in powerful ways. Education is broadly seen as a fair, relatively non-controversial route to opportunity, greater choice, and a better economic and social future for individuals who work hard.
- Most college-goers are not in a position simply to enroll in college and attend full time. Part-time schooling squeezed in between the demands on work and family is the typical situation facing most students in college, particularly the huge proportion of students who are above traditional college-going age. For these students, college credentials are often a long-term goal. Creative ways to accelerate their progress, promote structured learning at work, and break degree programs into shorter modules may be important strategies to increase access and success.

College learning generates human capital that is valued in the labor market—and postsecondary credentials embody that value. There is growing evidence that credentials are not just signaling devices that help employers sort employees but that credentials are indicators of productive human capital that pays off for individuals and for the communities and regions in which they live and work.

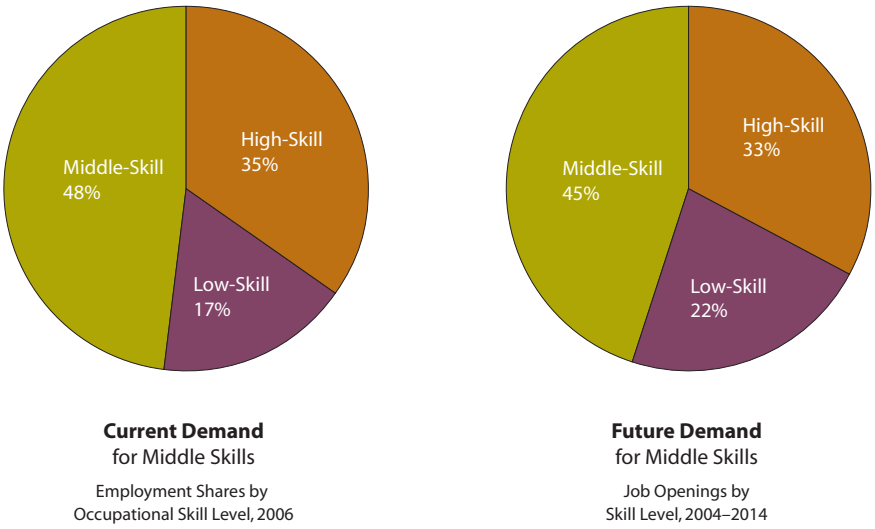
A recent study of cities with the fastest growth rates concludes that the proportion of college-educated residents is driving that trend: between 1980 and 2000, metropolitan areas with fewer than 10 percent of adults holding college degrees grew by only 13 percent compared to those with at least 25 percent of residents holding degrees, which grew by a remarkable 45 percent (Glaeser & Saiz 2003). The authors conclude that college education raises productivity by making individuals better able to adapt to and take advantage of changing conditions and opportunity. Similarly, recent research suggests that those with more education can use information technology more productively: while high school graduates' use of information technology can boost their productivity by 15 percent;

workers with at least some college experience who use information technology on the job can raise theirs by nearly twice that (Carnevale 2008). Postsecondary attainment not only improves individual prospects; it contributes to economic productivity and growth.

The most recent evidence of the economic value of cognitive skill development comes from Eric Hanushek (2008) of the Hoover Institution and several colleagues. Through a careful analysis of PISA test results across participating nations and the relationship of PISA scores to a nation's economic growth over the past three decades, the authors conclude that the most important factor in economic growth of nations is the quality, not just the amount, of schooling students have. That is, cognitive skills—not attainment—drive growth. Hanushek and his colleagues ask an important corollary question: should nations invest in the high flyers (e.g., the rocket scientists and major intellectual talent), or should they invest in bringing up the basic skills of the general workforce? They conclude that both are needed: a long-term strategy must support and raise the skill levels of students and workers at all levels. The importance of extending more people's education and preparation for careers beyond what they can learn in high school does not mean that the national goal should be a Bachelor's degree for everyone. The education system cannot easily absorb such a dramatic change. Moreover, from a national economic perspective (as opposed to an individual's point of view), it would be overshooting. There is no question that a baccalaureate generates more economic value for an individual than an Associate's degree or some college credits without a credential. The additional value is significant. And economist Anthony Carnevale (2006) warns that there is likely to be a serious shortage of workers with baccalaureates in the years ahead, given trends in the technology and knowledge-rich segments of the economy.

At the same time, while some have argued that the middle has been hollowed out of the job structure, Harry Holzer and Robert Lerman (2007) of the Urban Institute argue that about 48 percent of today's employment opportunities are middle-skill jobs—that is, jobs that require more than high school but less than a four-year degree (typically a two-year credential). They contend that replacement needs as older workers retire will keep this group of jobs an important target for less well-prepared youth and adults and that filling those jobs is an important national goal *(Figure 11)*. There are shortages of people for many of these middle-skill jobs, such as construction workers and inspectors, medical technicians, nurses, and firefighter/EMTs. Efforts to increase the supply of postsecondary credentialed Americans should support expansion in both the two- and four-year sectors.

Figure 13: Demand for Middle Skills



Current Demand for Middle Skills

Employment Shares by Occupational Skill Level, 2006

Future Demand for Middle Skills

Job Openings by Skill Level, 2004–2014

Source: Holzer & Lerman (2007)

Does a two-year credential have significant economic payoff? Thomas Bailey and colleagues at the Community College Research Center at Teachers College Columbia University used national data sets to assess the economic return to sub-baccalaureate attainment and credentials. While a complicated story, the general conclusion is positive. Students benefit from sub-baccalaureate education compared with those achieving only a high school diploma. Sub-baccalaureate students in occupational programs do at least as well economically as students in academic programs and sometimes significantly better. Obtaining a credential improves the return to education compared to those who have similar attainment but no credential. Women generally experience much greater economic benefit from schooling and credentials than men, particularly women who complete occupational programs and even more so academically challenged and economically disadvantaged women who complete two-year degrees (Bailey et al. 2004).

Twenty-first century success requires additional, non-academic skills, many of which are neither easily defined nor easily taught in formal classroom learning settings.

U.S. policymakers are rightly concerned with the need for strategies to raise academic skills, attainment, and achievement. This makes sense, given the changing cognitive and academic skill demands of better jobs. However, for various reasons—ranging from definitional challenges to the biases of policymakers—we probably have overemphasized the academic skills of reading, writing, and mathematics relative to other skills that are critical to workplace success and advancement, particularly for workers at the lower end of the labor

market. Employers seek not an "either/or" of academic or non-academic skills but rather "both/and"—an "academics plus" package of knowledge, skills, and attitudes that can increase an employee's ability to contribute productively over time.

Urban Institute economist Robert Lerman (2008) is passionate on this issue. He writes:

> The emphasis on schooling and academic test scores as skill enhancement strategies results partly from a failure to conceptualize and measure a broader array of skills that are critical to success in the workplace. Without institutions that specify and document a range of well-accepted generic and occupational skills, public statistical agencies regularly quantify only schooling and occasionally measure verbal and math skills based on test scores. These indicators are meaningful but incomplete and sometimes inaccurate or contested. As a result, we lack comprehensive measures of the job skills of the nation's workforce. We know little about the share of workers who have attained, for example, communication skills or the ability to allocate resources and to work effectively in a team environment.

As a result, insufficient attention has been paid to supporting the traditional ways these skills have been acquired—for example, through on-the-job training and apprenticeships. Policy tends to undervalue the variety of learning approaches that promote success. By devaluing the power of learning at and through work, our education strategies tend to be weakly connected to employers and to miss some important ways to help less-skilled youth and adults accelerate their education, skill development, and advancement.

Three sets of non-academic skills are increasingly important to quality employers seeking to compete on quality, service, and innovation as well as price. These are:

- Skills needed to perform in complex work environments under conditions of incomplete knowledge;
- Understanding and use of technology; and
- Creativity and abilities to innovate and be entrepreneurial.

There may be variation at the margins in the specification of these 21st century skills, but there is broad agreement on the growing importance of these broad categories of skills and knowledge in today's economy. There is also widespread agreement that today's educational systems—and our very conception of education—will have to change significantly if individuals are to internalize both the higher academic expectations and the broader range of non-academic skills that are becoming the minimum requirement in today's world.

Employers place a high value on work-related skills that are non-academic, particularly the skills related to problem-solving, critical thinking, communication, and working in teams.

In late 1980s, the Secretary's Commission on Achieving Necessary Skills (SCANS) made great headway in identifying the range of skills that employers wanted to see in their entry-level employees. The commission was tasked with identifying skills needed for employment proposing proficiency levels; recommending ways to assess proficiency; and creating outreach strategies for schools, employers, and families. The lasting impact was in conceptualization rather than implementation, which was limited. SCANS put a framework on the "soft skills" that employers consistently say they seek. The commission focused on competencies in the areas of resource use, interpersonal skills, manipulation of information, understanding of systems, and application of technology. It concluded that competent workers in the high-performance workplace need a combination of basic academic skills, thinking skills, and personal qualities that drive them toward accomplishment and success (Secretary's Commission on Achieving Necessary Skills 1991). The bulk of these skills are not generally viewed as traits that can be formally taught without opportunity to develop them in context and experientially, include the capacities to work in a team, budget time, listen and communicate effectively, and locate and apply information.

Since the SCANS Commission, various reports and studies have highlighted the importance to employers and economic success of these same skills, attitudes, and workplace behaviors: the ability to think, learn, and adapt quickly, and the ability to apply broad competencies supported by discipline-specific and technical expertise in ways that can be transferred to new situations and problems.[1] While these skills are often called "soft skills," they can be the difference between a workplace that is flexible, adaptable, and productive and one that is not (Karoly & Panis 2004). And they can be the key to individual advancement, as well. Some researchers argue that non-cognitive capacities, such as persistence, self-discipline, and dependability, may contribute at least as much to individual long-term success than IQ (Heckman & Krueger 2004; Rosenbaum 2004). Across these analyses, there is a common emphasis on a set of skills, knowledge, and ways of approaching a problem that is highly valued by both postsecondary educators and employers: critical thinking, which has been defined as "the sort of mental activity that uses facts to plan, order, and work toward an end; seeks meaning or an explanation; is self-reflective; and uses reason to question claims and make judgments" (Noddings 2008).

A characteristic synthesis can be found in this comprehensive framework, developed by Georgetown economist Anthony Carnevale (2003):

Basic Skills: Reading, Writing, and Mathematics

Foundation Skills: Knowing How to Learn

Communication Skills: Listening and Oral Communication

Adaptability: Problem Solving and Creative Thinking

Group Effectiveness: Interpersonal Skills, Negotiation, and Teamwork

Influence: Organizational Effectiveness and Leadership

Personal Management: Self-Esteem and Motivation/Goal Setting

Attitude: Cognitive Style

Applied Skills: Occupational and Professional Competencies

Technology competencies will undergird education and performance for all people at all levels of institutions.

A critical set of skills and knowledge in today's economy center around the understanding and use of technology. Technological change is perhaps the strongest underlying driver of the 21st century economy: technology allows for both asynchronous and synchronous learning, access to information 24/7, quick communication across the globe, and the powerful combination of personalized information and service delivery on a mass scale that is at the heart of much innovation today. Appreciation of and comfort with the power and dynamics of technology and with its uses are increasingly important to social and economic well-being.

More than a decade ago, economist Harry Holzer (1996) found that only 5 percent of even low-wage jobs did not require some computer use. The impact of computers on the skill levels required in different jobs is likely a key factor in growing income inequality in the United States. And, as noted above, recent research suggests that those with more education can use information technology more productively: while high school graduates' use of information technology can boost their productivity by 15 percent, workers with at least some college experience who use information technology on the job can raise theirs by nearly twice that (Carnevale 2008).

The National Academy of Engineering defines technological literacy in terms of capabilities, knowledge, and ways of thinking and acting that are widely applicable—well beyond the context of science- and technology-based fields.[2] According to the academy, a technologically literate person:

- Recognizes the pervasiveness of technology in everyday life;
- Understands basic engineering concepts and terms, such as systems, constraints, and tradeoffs;
- Is familiar with the nature and limitations of the engineering design process;
- Knows some of the ways technology shapes human history and people shape technology;
- Knows that all technologies entail risk, some that can be anticipated and some that cannot;
- Appreciates that the development and use of technology involve tradeoffs and a balance of costs and benefits; and
- Understands that technology reflects the values and culture of society.

Employers are increasingly interested in and concerned about the ability of employees to be creative, innovative, and entrepreneurial.

In 2007 testimony before the U.S. House Science and Technology Committee, the president of the Council on Competitiveness, Deborah Wince-Smith, called "insight, imagination, and ingenuity" the essential drivers of the 21st century economy. Studies of employers' views and of the future of work find that creativity and the capacity to innovate will be especially valuable in employees.

A recent Conference Board and Americans for the Arts survey of school and business leaders found overwhelming agreement that creativity is increasingly important in American workplaces (Lichtenberg 2008). At the same time, though, this belief does not often translate into school curricula or workplace training: findings indicate that most high schools and employers only provide such training and studies on an elective or "as needed" basis, despite the recognition from both businesses and schools of the critical role of creativity as a workforce skill, and the role each group has in fostering it. Few schools include arts training as a mandatory part of the curriculum, and most businesses only provide creativity-fostering training to very few employees. Employers and educators have somewhat different views of the highest priorities: while school leaders place problem solving at the top of creativity-related skills, employers give that place to problem identification and articulation. The bottom line, though, is the same in either case: while the basics of English and math competency are more

and more critical, education cannot simply be about mastering basics. This reality demands new collaboration among schools, postsecondary institutions, employers, and other institutions and their leaders—and a commitment to a more varied set of quality options and opportunities for learning.

The Challenges Facing Schools, Postsecondary Institutions, and Employers—and the Road Ahead

Educational institutions and the employers who ultimately hire and compensate their students are beginning to adapt to these new demands and expectations.

High schools, postsecondary institutions, and employers all recognize the need to produce a higher level of preparation for college or career among our nation's young people coming out of high school and among older individuals who wish to improve their position in the labor market and their ability to contribute. These institutions are groping toward new standards and instructional approaches that can accomplish this challenging task and ensure that the nation's less academically prepared and less employment-ready residents are brought along. This section the highlights efforts of K-12 systems, higher education, and employers to adjust to the new reality and to define and then address the need for more and different knowledge, skills, and habits of mind.

High schools are ratcheting up high school graduation requirements, with the ultimate goal of aligning high school completion requirements with the expectations of colleges and world-class employers for graduates who are ready for postsecondary academics and have the "habits of mind" that are critical to college success and career navigation.

The most important determinant of postsecondary education success is the academic rigor of one's prior education—in terms of both academic intensity and quality. Success in college depends upon being able to demonstrate and put to use knowledge and skills that few high schools impart to all their students. The American Diploma Project (2004), organized by a consortium of national education policy groups, has highlighted the limits of high school graduation requirements in many states. Moreover, ADP is working with almost three dozen states to help them implement higher academic standards for *all* students, particularly in English and mathematics. ADP researchers argue that the academic skills and knowledge needed for college success are the same as those needed for career success in an increasingly demanding economy. This view has been echoed by ACT, Inc., which used an analysis of jobs in the "middle" (those that require more than a high school diploma but less than a Bachelor's degree) to develop a

map of the minimal skills necessary for educational and economic success. Using data about job requirements from the federal government's Occupational Information Network (O*NET), ACT concludes that employers and higher education institutions require both proficiency in reading for information and applied mathematics, including algebra, geometry, and statistics (American College Testing 2006).

David Conley of the Center for Education Policy and Research in Oregon has been working with several states to introduce college-ready assessments and curricula to their high schools. His analysis emphasizes not only high levels of academic expectations but also serious attention to instilling the pacing, candid feedback, and habits of mind that are critical to college success, such as interpretation, problem solving, critical thinking, analytic research, and accuracy (Conley 2007).

The pressure for higher graduation requirements will continue to drive states to raise standards for graduation completion, so that the number of graduates who require remedial courses in college or who cannot meet employer expectations is dramatically reduced.[3] This is a welcome development, but it poses significant challenges for our K-12 system, and for our high schools, in particular. Without special efforts to help lower-performing students accelerate their progress and master the higher standards, the educational and economic gulf will widen. To raise academic expectations without leaving the most vulnerable students behind will require new and different supports, schools, learning programs, and opportunities that engage students, motivate their learning, and instill in them a sense that they can learn and succeed. A college-going culture can be created and sustained—as can a career-focused learning environment built around active, engaged inquiry. This will not happen automatically, but if our educational systems and institutions do not adjust to this challenge, regional opportunity will polarize and regional growth runs the risk of stagnating.

Higher education institutions have begun to recognize the need to include more than academic skills and knowledge in their formal and implicit curricula.

Higher education institutions and the associations that represent them are engaged in a wide array of initiatives designed to examine the needs of the 21st century economy, the role of the academy therein, and options for curriculum, teaching and learning, research, and service. Colleges and universities start from an emphasis on academic rigor, but they increasingly realize that academic skills alone are not sufficient preparation for many students. In one of many such examples, Virginia Commonwealth University has shifted its definition of academic goals for its students from discipline-specific formulations to a broader

set of six cross-cutting skill areas: communication, critical thinking, information fluency, collaborative work, ethical and civic responsibility, and quantitative literacy (Strauss 2008). The Association of American Colleges and Universities recently issued a report describing a consensus-based definition of the essential preparation for work, life, and citizenship that college should provide (Association of American Colleges and Universities 2007). The AACU framework reflects a creative synthesis of academic and non-academic skills and knowledge that together form the foundation for success in today's economy, ranging from knowledge of human cultures and the physical and natural world, to intellectual and practical skills, personal and social responsibility, and integrative learning across disciplines *(see Appendix 1, "AACU Essential Learning Outcomes Framework")*. These reformulations point toward new priorities for two- and four-year institutions that may change the college experience for both traditional and non-traditional students.

Employers are beginning to see the need for a workforce that combines academic foundations with non-academic and even non-cognitive skills, knowledge, and dispositions.

Employers and their organizations have made a cottage industry of commissions and pronouncements on the rising skill needs and challenges facing business. The Chamber of Commerce and the National Association of Manufacturers have business arms that focus exclusively on the skill and training needs of their members. Employer rhetoric often outstrips the reality of change in employment or workplace practices—and some employers and sectors are competing successfully on price rather than quality, on volume rather than innovation. But there are signs of a new concern and some creative new formulations of the challenge and the direction of change. A recent survey of 400 employers from across the nation asked about the skills they want new hires to have (Conference Board et al. 2008). While respondents said they valued academic skills, they rated four types of more general skills as most important: professionalism/work ethic; oral and written communication; teamwork/collaboration; and critical thinking/problem solving.

The Partnership for 21st Century Skills is a provocative, fledgling, business-led effort to define the skills that young people need to develop if they are to succeed economically. Led largely of major technology and education-related major companies, such as Apple, Cisco, Dell, Microsoft, and Oracle, the partnership advocates that all young people have access not just to rigorous academics—as specified in most state testing and assessment regimes—but to a quality, integrated, "academics-plus" learning program that includes:

- *Core subjects*—English, reading, or language arts; mathematics; science; foreign languages; civics; government; economics; arts; history; and geography;
- *21st century content*—Global awareness; financial, economic, business, and entrepreneurial literacy; civic literacy; health and wellness awareness;
- *Learning and thinking skills*—Critical thinking and problem solving; communication; creativity and innovation; collaboration; contextual learning; information and media literacy;
- *Information and communication technology literacy*—the ability to use technology to develop and use 21st century content knowledge and skills; and
- *Life skills*—Leadership, ethics, accountability, adaptability, personal productivity, personal responsibility, people skills, self-direction, social responsibility.

(*See Appendix 2 for a graphic representation for this framework*.)

The formulation is quite creative and far-reaching. This provocative effort to reframe current policy and practice, led by employers who feel the current solution set is too limited, has begun to get some attention and traction. Coalitions in six states, including Massachusetts and Maine, have signed onto efforts to integrate the partnership's ideas around skills and knowledge into state policy and school practice.

The quest for knowledge and skills is not exclusively the purview of the formal education sector.

We have emphasized that a range of different academic and non-academic skills and knowledge are needed to succeed in the 21st century economy—and that postsecondary learning and credentials are critical to that success. We recognize, though, that traditional education needs to be augmented in a number of ways if more people, particularly those traditionally underserved in education and the economy, are to be in a position to advance and succeed. Starting in PreK-12 and moving through postsecondary institutions and employers, a world that demands lifelong learning and experiences that can raise both academic and other critical work-related skills requires a more comprehensive and varied set of learning options for young people and adults. Schools are at the heart of efforts to educate—but the formal education sector cannot be left on its own: the task is too great and the resources and opportunities that exist outside formal education are quite rich.

The six- or seven-hours-per-day, nine-month school calendar cannot provide all the preparation students need. Students, especially disadvantaged ones, lose ground academically during the summer, and programs that take advantage of

out-of-school time, both during the summer and after school, have shown significant promise in building achievement (Cooper 2003; Miller 2007). For younger students, after school and the summer provide opportunities to deepen academics and also to instill leadership, communication, creativity, and other important social and thinking skills. For high school age students, coordination of school and work—through internships, work experiences, and other opportunities—can help students stay engaged, become more realistic about career options, develop relations with caring adults outside school, and understand how some of what they learn in school is applied in the world of work. For the older high school student—and the college-going student—international examples such as Germany and Japan provide additional models for thinking about ways of building students understanding of the world of work, of the options that exist, and of the steps they must take to reach their goals. In both countries, employers take on part of the responsibility, through hiring and training programs, and through ongoing relationships with individual schools (Rosenbaum 2004).

Learning outside the formal school system can also provide a boost to less-skilled and academically underprepared adult workers. The workplace can be a powerful learning place: workplace literacy efforts funded by the U.S. Department of Education over the years have demonstrated great potential; ESL classes offered at work are growing in popularity as immigrants make up an increasingly large proportion of lower-wage workers; and work-based learning in learning-rich occupations, such as health care and IT, is being used in innovative ways to help workers advance in knowledge, skills, and often compensation.

The education landscape of tomorrow will be more diverse than today's, given the need for varied and new pathways for underprepared individuals to advance, become college-ready, and succeed in education and the economy. Multiple pathways will be needed—and are beginning to emerge: pathways that help struggling students catch up and succeed in high school; pathways that recapture out-of-school youth or that combine GED programs with additional learning that links seamlessly to college-level courses and programs; pathways for older youth, 18-24, who may need a shorter avenue to a skilled job and that creatively combine academic, technical, and soft skill learning in a package including paid work and formal instruction. More fluid and flexible expectations of time to completion are likely to gain traction: shorter time for those who can move quickly into and through college experiences and courses; longer time for those who start so far behind that they need extra supports and time to catch up. New partnerships of schools, colleges, learning-rich cultural institutions, employers, and community-based organizations will be needed as schools are no longer expected to "do it all themselves."

The contours of the new landscape are only beginning to emerge. Additional experimentation, innovation, testing of alternatives, and support for approaches that work for distinct populations are needed—for the sake of those who are most at risk and also for the well-being and vitality of the region, its states, and its communities.

Characterizing What Preparedness and Success Demand: An Integrated Framework

Preparing young people for success in the 21st century demands a higher level of academic skills than in the past but also a mix of academic and non-academic skills that employers want to see and that make for better and more engaged citizens. High school education, even a more rigorous high school education than students now get, will not be enough. So strategies that smooth the transition to postsecondary learning are critical. And academic knowledge is not enough. Academic skills, work-related skills, and the dispositions that promote inquiry, engagement, collaboration, and creativity are all part of what the successful individual will bring to the economy.

The data and evidence summarized in this background paper underscore several core themes about the skills and knowledge that students need, and that our education reforms should promote. The primary skills and knowledge needed for success in the 21st century can be organized and summarized under four headings, or competencies: content knowledge; intellectual skills and habits of mind; practical knowledge; and practical skills and behaviors *(see Table 24)*.

Table 24: 21st Century Core Competencies

Content Knowledge For example: • Language literacy • Quantitative literacy • Scientific literacy • Understanding of the world, past and present • Technological literacy	**Intellectual Skills and Habits of Mind** For example: • Critical reasoning • Creative thinking/innovation • Analysis • Commitment to learning • Problem identification and problem solving
Practical Knowledge For example: • Understanding of career pathways and knowledge applications • Understanding of the responsibilities of citizenship	**Practical Skills and Behaviors** For example: • Time management • Workplace conduct • Working cooperatively • Self-direction/persistence • Communication

A young person who is prepared for success as an adult will have developed skills, knowledge, and ways of dealing with new challenges and situations in each of these areas, through formal and informal learning opportunities and through structured and unstructured experiences. The 21st century learning system must be able to help young people and working adults to develop and improve their skills and knowledge across these domains. To meet 21st century goals, a model of education that is more multidimensional than some current policy and rhetoric offers will be needed. An alternative to the "zero sum" approach of academic versus practical, hard skills versus soft is to view the preparation of young people for adulthood as a marble cake or mosaic that reflects the interests, goals, and aspirations of each individual.

How different institutions and stakeholders collaborate so that development of these varied skills becomes more attainable and routine for more individuals, particularly those for whom higher education and skilled employment have traditionally been out of reach, is perhaps the greatest challenge facing New England and the nation today. Philanthropy can play a critical role in shining a light on the problem, seeding new approaches and solutions, and spurring policymakers to invest and sustain what works, in general and in particular for society's most vulnerable groups.

Part 3. Preparing New England Residents for the Future: How Can the Odds for Success be Improved?

This report has depicted some of the challenges facing New England in terms of economic health and direction, with a focus on the skills and educational attainment the future is likely to require and the gaps in preparation of the New England population. The overarching challenge is clear: The region's economy requires increasing levels of education and preparation, but large numbers of New Englanders lack the skills and knowledge they will need to succeed in the years ahead. More specifically, the scan conducted for this background paper leads to the following conclusions:

- Some postsecondary education credential is essential for all students and increasingly will be the gateway to jobs with decent income and career potential. At the same time, academic skills are not the only skills that employers value and seek from new employees.
- Existing educational institutions are not equipped to help all students to graduate from high school ready to succeed in college without remediation. Nor are they well equipped to help all students develop additional work-related skills and knowledge valued in the labor market. Too many young people and working adults leave school academically underprepared for success in the new economy, particularly individuals from low-income and other traditionally underserved groups who had weak educational experiences.
- To overcome the opportunity gaps facing New England residents will require a much richer and more varied range of new schools, learning approaches, programs, supports, and opportunities, inside and outside traditional school buildings and time constraints. In addition, transparent, high-quality pathways to postsecondary readiness and success are needed, particularly in urban areas where many adolescents are disengaging early from their educational experiences. These pathways should be designed to help individuals advance quickly from where they are, enable them to reengage with powerful and relevant learning, and support them as they work towards higher expectations that will lead to success in postsecondary education and the workforce.

If New England's educational, civic, and political leaders want to drive dramatic improvement in student preparedness for 21st century success, a multidimensional strategy will be needed: a combination of ***messaging*** about the challenges we face; improvements and innovation in ***practice*** that can help more underprepared youth and adults advance and succeed; and ***policy*** changes that can accelerate and sustain the spread of more effective and diverse learning opportunities and outcomes. The extent of the challenge and its implications for the economic and civic well being of the six New England states are still not fully understood, nor is the urgency truly felt by policymakers or the public. At the same time, solutions, in terms of promising approaches to practice and policy, need further experimentation and specification. A comprehensive effort would: end the ***invisibility*** of the numbers of youth that are not succeeding in our education and workforce systems; spur a wave of ***invention*** of new options, approaches, and models for serving the many struggling and underprepared youth in our systems and enabling them to benefit from college learning; and invest in the ***infrastructure*** of policies and partnerships for change that can be sustained over time and lead to significant upgrading of knowledge, skills, and economic success.

A postsecondary credential is essential for all students, regardless of their background or aspirations. At the same time, academic skills are not the only skills that employers value and seek.

A high school education is no longer a sufficient credential for economic success. Numerous studies, including those cited earlier in this report, specify the correlation between a postsecondary credential and access to high-growth, high-wage jobs, a trend that is expected to broaden and continue. Too few jobs with potential for advancement and decent wages are available to those with a high school diploma, a GED, or less. Moreover, a weak high school experience—one that does not prepare graduates for success in first-level, college-credit courses without remediation—is a wasteful disservice to individual students and to the region's economic base. Particularly in New England, where demographics and economic trends make it imperative that the skills of every potential and current worker be raised, the ultimate goal of a college credential for all, coupled with steps to increase college success rates right away, must become a regional priority. And, as noted above, successful education must incorporate valued non-academic skills, such as critical thinking, problem identification and solving, and working collaboratively in complex teams.

Sophisticated academic and non-academic skills and knowledge needed.

The key to long-term economic growth and well being in New England will be innovation and brains. New England residents may not be unique in needing a

full complement of skills and knowledge if they are to prosper in the 21st century, but New England states have few resources other than human capital upon which to build and plan for prosperity. The region, its states, and its communities face sizeable gaps between residents' skills and knowledge and the rapidly changing and increasingly demanding needs of employers competing in a global economy.

Academic skill levels must be ratcheted up, as states and K-12 systems are trying to do, so that high school graduates are ready for college success and so that college-going and *completion* become a more routine expectation. But this is not enough. In a 2004 survey, employers reported that significantly more than half of applicants coming to them were deficient in knowledge and skills needed for the jobs they sought. High school graduates were weak in the academic skills of writing in English, mathematics, and reading comprehension, although applicants with two- or four-year degrees were better prepared than those with just a high school diploma. Employers surveyed on skill needs note a need not just for good basic skills but also creativity, the capacity to think critically, and associated skills that are transferable to varied work settings—skills that also equip young people to learn, adapt, and grow.

New England residents compete in an economic environment characterized by rapid technological developments and complex interactions among such factors as globalization, trade imbalances, wage competition, and global climate change. The uncertainty and rapidity of change is likely to increase employers' call for flexible, adaptable, quick learners who have a solid base of reading, writing, and math skills and a set of problem-identification and problem-solving skills and can respond efficiently.

Bottom Line Implications

A college credential is increasingly important as the gateway to a good career—and increasing the overall stock of human capital in the region is critical to long-term economic growth. This does not mean that everyone needs a four-year Bachelor's degree. Middle-skill jobs that pay well demand large numbers of workers with two-year degrees, industry-recognized credentials, or apprenticeships. Moreover, given that most college (and many high school) student's work, the route to a college credential does not have to be the traditional linear pattern of schooling first, then work. More varied combinations are possible, as long as all educational programs are geared toward advancing students to higher levels of academic and other work-related skills and knowledge, and not to a lesser set of standards.

The changing economic reality and its implications for individuals and for our learning systems pose profound challenges. The first priority for the region is to ensure that those challenges are well understood—that the public and policymakers understand that New England's future depends on rising aggressively to the education and skills challenge. We cannot afford to be complacent. Nor can we afford to believe that some segments of our youth and adult populations are expendable and that we can succeed economically as a region if we simply take care of the top performers and the educated elite.

This shift has important implications for civic and public leaders. They will need to embrace a more consistent, coherent message about the collective imperative to design a broad skills framework and then raise skills across the region. Policymakers will need to build and make the case for the full range of skills that are needed to succeed in the 21st century—and why this challenge demands reducing disparities in skill throughout our education and learning sectors, not just for the most advanced learners. They will also need to champion and make visible the varied kinds of formal and informal opportunities that can help the region, its residents, and its institutions make the transition to delivering on a more demanding and challenging set of expectations.

If disadvantaged youth and working adults are to access the instruction and supports they need to master 21st century skills and knowledge, existing institutions will need to be supported, challenged, augmented, and given clear incentives to improve outcomes.

Disadvantaged young people, and underserved individuals more generally, need both enriched learning experiences and a range of supports and guidance if they are to move through and complete K-12 education equipped to succeed. New England's cities and rural areas have significant pockets of poorly performing schools that are unable to help all their students achieve at high levels. Existing educational approaches may have been adequate for an economy that only expected a quarter to a third of high school graduates to complete college, but they no longer suffice. Efforts to spread quality and success more broadly and evenly will require new approaches in practice and policy—starting with early education and moving through the elementary, middle, and high school years.

Significant opportunity gaps must be overcome.

Although New England states lead the nation in educational attainment as measured by standardized tests, it is clear that some groups are poorly served. Low-income, minority, and urban students achieve at far lower rates than do their

peers, and on some indicators the gaps are more pronounced in New England than in other regions. This is cause for concern, given the increase in the proportion of the region's population that is less prepared for academic success at exactly the time when skill and knowledge requirements are rising.

The different New England states have somewhat different profiles—both in terms of employment opportunities and the distribution of educational attainment and achievement. The highest-wage, knowledge-economy jobs, for example, are concentrated in southern New England, while roughly half of employment opportunities in the three northernmost states are projected to be middle-skill jobs. More immigrants have settled in the southern states, but some of the fastest-growing immigrant communities are located in northern New England.

However, none of these variations alter the basic fact: current educational institutions and systems are ill-equipped to help a significant segment of young people and adults meet high academic and other work-related skill development standards—or to help them overcome poor academic preparation or workforce inexperience and get back "on track." This population is concentrated in low-income, immigrant, and minority communities and families.

Bottom Line Implications

Our region's educational institutions must be supported and prodded to do a better job of reaching and teaching all. To meet this goal, the all-too-separate systems of education—PreK-12, community college, and higher education—need to be in much closer communication and alignment in terms of expectations, signals, mutual support, and accountability. In a significant number of schools that have adequate capacity to improve instruction, learning, and supports, improvement is possible: with better tools and more focused professional development and support, teachers and administrators will be able to help many more young people achieve, advance, and earn a postsecondary credential. Investments in proven approaches for raising achievement and motivating students to succeed can and will make a difference, as will policy interventions that create the right incentives for educational institutions to help all students succeed.

However, an incremental approach to change will not be enough, especially in large or underperforming districts that are experiencing dismal rates of academic preparation, school completion, and postsecondary success. Traditional high schools in many areas are simply unable to provide the supports and instructional approaches struggling students need to experience and maintain academic success. While some alternative schools or GED options exist, they are typically inadequately staffed or funded to address their students' serious learning defi-

ciencies and needs. And research shows that earning a GED is, by itself, inadequate preparation: only when a GED is a stepping stone to additional learning and credentials does it have a labor market payoff.

A more varied and robust set of schools, experiences, programs, supports, and opportunities for learning—inside and outside traditional school buildings and traditional time constraints—is needed to overcome opportunity gaps facing less advantaged New England residents.

The challenges facing New England's education and learning institutions are two fold: to accelerate and raise academic achievement of large numbers of students so they graduate high school ready to succeed in postsecondary learning and careers; and to provide more systematic exposure to and experience with non-academic skills that employers want to see in 21st century employees. We are asking our institutions to do more for all students—and to prepare weaker students to higher standards and expectations of colleges and employers. Success will require changes up and down our educational system, starting in early childhood years. And it will require collaborations and partnerships between educational and non-educational institutions that can augment school learning with opportunities for knowledge and skill development that reflect the breadth of 21st century standards and expectations.

The "invention challenge" requires a broader vision of education and pathways to success.

The challenge facing our systems is what to do to: keep all students moving forward with opportunities that engage, motivate, and support their learning; early and effectively help those who fall behind with extra instruction, attention, and educational and social services; and support all young people with the range of experiences that build a broad and flexible skill base needed for success in their future lives.

As students age, accumulated disadvantage becomes increasingly difficult to overcome. On the one hand, this argues for ongoing monitoring of students' progress and effective intervention that helps them from falling off track or disengaging. On the other, it argues for a set of learning options and programs, starting in the earliest years, that help all youth stay in school and develop their capabilities, accelerate their learning when needed, and graduate able to attend and succeed in postsecondary education (e.g., summer experiences, project-based approaches, better use of out-of-school time during the year, career or work-based explorations, community service, arts opportunities). For young people from less-advantaged families and communities, this requires providing opportu-

nities for growth, development and learning that more affluent families regularly provide to their children in summer and during the school year.

By high school, young people need different pathways that can support their progress to the common goal of 21st century academic and non-academic skills and knowledge. Some young people will have acquired the necessary academic skills and knowledge and "habits of mind" needed for college success long before the end of the twelfth grade. They should be allowed to accelerate their progress. But young people who have not been successful in, or well served by, the traditional school model are likely to need a range of supports, advice, influences, and learning environments that are not typical within traditional high schools. They should have options for connecting with opportunities that interest them, accelerate their learning, and provide transitions to postsecondary and work place settings. This is not an appeal for a new form of tracking or sorting; rather, it is an acknowledgment that individuals develop intellectually at different paces and respond to instruction in varied ways. By high school, a single curriculum and instructional approach will leave behind too many students who can accelerate to college-readiness if their individual interests, passions, and weaknesses are more directly addressed.

As a society, we don't yet know what these pathways should look like if more young people—particularly minority and low-income students—are to leave K–12 education ready to succeed. Michelle Cahill, formerly a top official in the New York City school system, notes that there is an "invention challenge" of huge proportions in most communities. We don't have enough great schools—at the elementary or high school level—for struggling students. As high schools remain stubbornly resistant to improvement in test scores and student performance compared to elementary schools, the need to create, test, and spread more effective high school models that target the needs and interests of particular groups of students stands out as a key challenge.

At the same time, we know that diagnosing and acting to "remediate" academic skills gaps in the middle of the high school experience is too late. Foundational academic skills are built through well-aligned P-16 standards, curricula, and instruction that allow students to gradually build conceptual understanding and expertise, and then to branch out (and differentiate), depending upon individual interests and goals. Non-academic skills also develop progressively, through multiple opportunities to observe and model behaviors and strategies, apply skills and knowledge, and explore and build on developing strengths. An effective educational strategy will require commitment to improvement from the earliest school and family experiences, not just in the later pre-college years.

Policymakers can help to better align and support quality standards, assessments, curricula, and instruction across school systems. Progress is being made, though slowly, in this arena. Policymakers can also create incentives for schools and districts to incorporate the critical thinking skills, creativity, and habits of mind identified earlier as critical for success in the 21st century. Efforts in this direction are less well developed in New England and nationally, partly because of the technical difficulty of specifying standards for these skills and incorporating them into accountability systems, and partly because of the very different relationships with individuals and institutions outside schools required—with responsible adults, community institutions, authentic issues, and places of work.

But until we create new and stronger educational programs and institutions that are more responsive to the varied needs, strengths, passions, and weaknesses of individual students, the opportunity gaps identified above will persist, and neither postsecondary institutions, business leaders, nor policymakers will achieve their common goal of college and career readiness for all.

Bottom Line Implications

The challenge of breaking through the inability of current educational and other institutions to help more low-income, minority, and immigrant students succeed in K-12 education and graduate high school prepared for 21st century college and career success is acute in all New England states. And how best to propel significant improvement is not yet fully clear. The "invention challenge" is real. It begins in the early years of education. We need much better ways of identifying students falling behind and intervening to help them stay on track. As students age and progress, they need a more varied range of experiences, programs, schools, and pathways to college and career readiness than currently exist.

The first critical step is to acknowledge the challenge in its fullness and several dimensions. Once policy leaders agree on the goals—broad skill development and some college for all—then our states and districts/communities need to design ways of getting there that are responsive to individual student and community needs and circumstances.

We need a period of aggressive development, testing, and promotion of approaches and models that challenge traditional constructs of education delivery with different combinations of engaging and rigorous in-school and out-of-school learning. These new approaches will have to encourage experimentation with time, sequence, and content (when and how learning occurs) as well as space (where learning happens). This will not happen without policies that provide incentives to innovate and a willingness to challenge long-held notions

about the allocation of funds (so resources can be used in different ways, rather than advocate solely for new investments). And it will not happen without new alliances and partnerships across education sectors and with other stakeholders in the education enterprise.

Highly successful schools and programs serving at-risk youth, adolescents, and adults do exist—and there are many to learn from in the New England states. But there are not enough. If we want rigorous learning programs that are able to hold struggling or low-income students and keep them moving forward, there needs to be investment in innovation and evaluation and also continual support for and testing of new models. These models have great potential for changing our core ideas about quality education and its delivery. They might be self-contained; they might cut across sectors and engage varied partners. Some might combine formal learning with supports that engage health, nutrition, and social welfare systems, or housing and economic development and juvenile justice systems. Some might engage employers in close partnerships designed to prepare students who are not quite academically or otherwise college-ready for quality employment and further learning. The challenge for policymakers, educators, and philanthropy is how best to prioritize needs and opportunities for improvement that is sustainable and scalable.

Conclusion

The next phase of education reform will require continued progress in implementing the standards-based reforms and accountability initiatives that have become central to states' efforts to narrow the achievement gap. While necessary, these efforts are not sufficient. Standards-based reform principles must be expanded and augmented to encompass a more multidimensional view of education. Such an approach would create a more powerful push for the development of the kinds of innovative and cross-sector learning programs that are essential to meeting the needs of both individuals and employers.

The key messages of this analysis can be distilled down to these:

- If New Englanders need both more rigorous academic preparation and opportunities to master other critical work-related skills to succeed in tomorrow's economy, then New England state leaders face a particularly complicated challenge: to expand access to postsecondary learning for many more students, but also to improve P-12 educational opportunities to help all young people meet these foundation goals, including the region's low-income, minority, and immigrant youth who are becoming an increasingly large segment of New England's population—and its future.

- If disadvantaged individuals need enriched learning experiences, as well as targeted, intensive support to increase their likelihood of success, then policy leaders need to better understand the barriers to broader educational attainment. They can then support the development of a much wider range of early and sustained interventions and opportunities—not just improvements in what goes on in the classroom and the school house, but also affordable access for lower-income learners to the kinds of quality out-of-school learning opportunities that are available to the more affluent, such as afterschool enrichment, camps, tutors, travel, and reading.
- If a more varied and targeted set of pathways to postsecondary learning and credentials are needed to help low-income and at-risk individuals advance and succeed, then educational leaders must be willing to revisit core beliefs about the structure and alignment of educational institutions and systems, the use of time in school and out of school for learning and skill-building, and the importance of targeting new school and program options to those with particular needs, talents, and circumstances.

Many exciting initiatives in New England currently support struggling students, help facilitate transitions from high school to college, and provide alternative pathways for struggling and off-track students (and for older individuals already working). These proof points provide important guidance for strategies to help New England move forward. New England's history of K12-postsecondary partnerships, business-education alliances, and other collaborations is a positive platform on which to build. Existing cross-sector partnerships can be leveraged to achieve more ambitious ends—and more and stronger collaborations can be built and nurtured.

Much has been learned in recent decades across New England about what it takes to help struggling students advance and succeed—the kinds of learning environments, schools, curriculum and instruction, supports from caring adults, opportunities to use out-of-school time to learn, grow, and develop leadership skills, and experiences in the community and at work that can help those who are off track to get back on track to success and quality employment and careers. These lessons can and must be built upon and extended.

Philanthropy has a critical role to play. Over time, the way out of the current difficult moment will require a combination of the following: ending the ***invisibility*** of low-income and minority students who are ill served by the existing institutions and systems; stimulating the ***invention*** of new and effective ways to help accelerate learning for all, broaden out the understanding of necessary skills and competencies, and reduce systematic gaps in performance; and putting in

place the institutional, governmental, and public/private ***infrastructure*** that can support and sustain these efforts.

Foundations and individuals of means can shine a light on the problem and its specification, helping opinion leaders understand its dimension and potential impact. They can help change core understandings and assumptions and begin to shape new public messages. Foundations can also help seed innovation and experimentation with approaches designed to help reduce gaps in opportunity and performance and help more individuals succeed. Finally, they can support and advise policymakers as they navigate difficult political terrain and make difficult choices about incentives and rules in ways that can promote improved performance and strengthen practice. Through a thoughtful but ambitious and risk-taking set of investments, philanthropy can help build and sustain practice, policy, and public will in ways that spur and sustain long-term improvement in 21st century readiness for many more low-income and low-skill New England residents.

Appendix 1. AACU Essential Learning Outcomes Framework

Beginning in school, and continuing at successively higher levels across their college studies, students should prepare for 21st century challenges by gaining:

Knowledge of human cultures and the physical and natural world:

- Through study in the sciences and mathematics, social sciences, humanities, histories, languages, and the arts

Focused by engagement with big questions, both contemporary and enduring

Intellectual and practical skills, including:

- Inquiry and analysis
- Critical and creative thinking
- Written and oral communication
- Quantitative literacy
- Information literacy
- Teamwork and problem solving

Practiced extensively, across the curriculum, in the context of progressively more challenging problems, projects, and standards for performance

Personal and social responsibility, including:

- Civic knowledge and engagement—local and global
- Intercultural knowledge and competence
- Ethical reasoning and action
- Foundations and skills for lifelong learning

Anchored through active involvement with diverse communities and real-world challenges

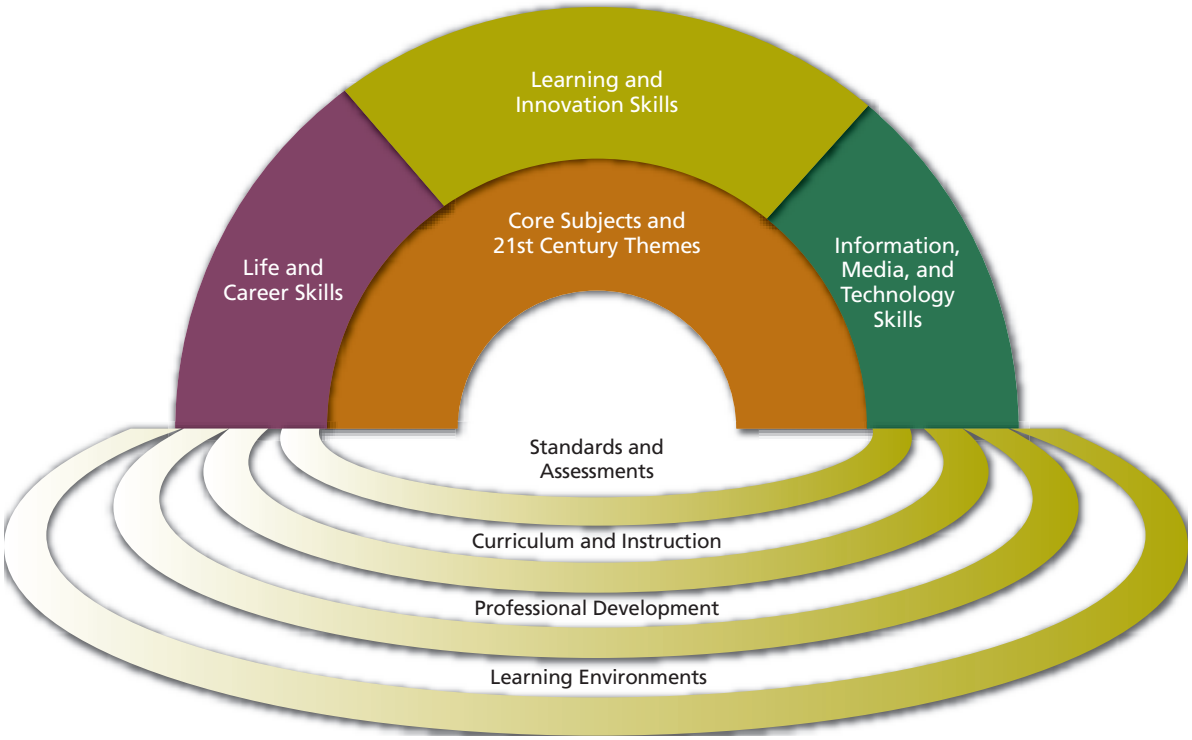
Integrative learning, including:

- Synthesis and advanced accomplishment across general and specialized studies

Demonstrated through the application of knowledge, skills, and responsibilities to new settings and complex problems

Source: Association of American Colleges and Universities (2007)

Appendix 2.
Partnership for 21st Century Skills Framework: Graphic Representation



Endnotes

[1] See: Public Agenda Online, www.publicagenda.org/specials/rcheck2002/reality5.htm.

[2] See: www.nae.edu/nae/techlithome.nsf/weblinks/KGRG-55SQ37?OpenDocument. Retrieved May 2008.

[3] See, for example, Core 40 in Indiana, www.doe.in.gov/core40/welcome.html. Retrieved May 2008.

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