

THE DEGREE

Honing In on
College Access,
Affordability &
Completion in
Massachusetts



GAP

THE DEGREE GAP

Fourth Annual Report on the Vision Project
to the People of Massachusetts from the
Massachusetts Department of Higher Education
June 2016



We will produce the best-educated
citizenry and workforce in the nation.

We will be national leaders in research
that drives economic development.

MASSACHUSETTS PUBLIC HIGHER EDUCATION

- 29 CAMPUSES
 - 15 COMMUNITY COLLEGES
 - 9 STATE UNIVERSITIES
 - 5 UNIVERSITY OF MASSACHUSETTS CAMPUSES
- 290,000 STUDENTS
- 40,000 FACULTY & STAFF
- 43,000 NEW COLLEGE-EDUCATED CITIZENS & WORKERS ANNUALLY
- \$630 MILLION IN ANNUAL RESEARCH EXPENDITURES

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LETTER FROM THE COMMISSIONER

ONE OF THE HIGHLIGHTS OF MY FIRST YEAR AS COMMISSIONER

of Higher Education has been the time I have spent crisscrossing the state to meet with leaders, faculty, staff and students at our public campuses.

From the Berkshires to the Cape, from Salem to Springfield, people have taken time to share their personal stories and professional achievements with me. I have witnessed the transformative power of public higher education to change the lives of low-income and homeless students. I have seen the results that come from local workforce partnerships and regional collaborations between campuses. There is much good work to be proud of—and as the pages of this report make evident, our public system of higher education continues to “get the job done” even when budgets are tight.

But with this fourth annual report of the Vision Project highlighting both demographic and economic challenges that impact our system’s ability to produce much-needed college degrees, I believe it is necessary for us to redouble our efforts in three specific areas of the Vision Project:

- **College Participation**
- **Closing Achievement Gaps**
- **College Completion**

With the majority of undergraduates in Massachusetts now attending our public higher education institutions, it is incumbent on all of us to ensure greater accessibility, more robust completion, and less variation in outcomes across the diversity of students we serve.

Although there is outstanding work taking place across all seven areas of the Vision Project, we have made the difficult but necessary decision to focus our efforts on achieving better outcomes in these “Big Three” areas of work.



During Santiago’s visits to campuses like Middlesex Community College (above), he listened and talked to students, local board members, political leaders, and business leaders.

As we hone in on a more focused agenda, described in detail beginning on page 20, we must also look for ways to bring our best practices to scale (see Chairman Gabrieli’s Viewpoint on this topic on page 10) and to work more effectively as a system. My campus visits have served to remind me of the unique qualities of each individual institution. But my message to campus trustees and to the readers of this report is the following: To truly live up to its full potential, public higher education in the Commonwealth needs to speak with one concerted voice. It is also necessary that we implement those effective practices that allow us to have the most widespread impact in key areas. My experience in other states has demonstrated that responding to educational challenges as a “system” of institutions, each one unique, yet committed to the overarching goal of serving the educational needs of all citizens of the Commonwealth, will accelerate the good work that is reported herein. ■

Inside the Degree Gap: What the Data Show

Pages 51–63 of this report show how the Massachusetts system of public higher education compares with other state systems by tracking performance across the seven outcome areas of the Vision Project. Overall, the system's performance remains relatively flat, with some areas of improving or worsening performance as noted below.



College Participation

IMPROVING PERFORMANCE ✓

- Massachusetts continues to be a national leader in the overall percentage of recent high school graduates who enroll in college.

FLAT PERFORMANCE ⊖

- Sizeable achievement and opportunity gaps—bigger than the national average—persist between white students and students of color when their ability to do college-level work in math and reading is measured and compared.



Closing Achievement Gaps

WORSENING PERFORMANCE ✗

- The overall gap between the number of White and African American students at community colleges who must take non-credit remedial courses has grown over the past five years.

FLAT PERFORMANCE ⊖

- The overall gap between White and Latino/a students taking remedial courses remains unchanged.



College Completion

FLAT PERFORMANCE ⊖

- Graduation rates for UMass and state university campuses are at an all-time high, with marked improvement shown at individual campuses. Still, at the segment level, overall graduation rates for public higher education are not yet improving at the ambitious, high-growth threshold of one percentage point per year. (See page 9 for a list of campuses that are meeting the threshold.)

IMPROVING PERFORMANCE ✓

- In the last year, the six-year graduation rate gaps between White and African American students has been reduced at the state universities and at the University of Massachusetts. The White-Latino/a graduation rate gap has also been reduced at UMass. These gaps, however, remain in the double digits.

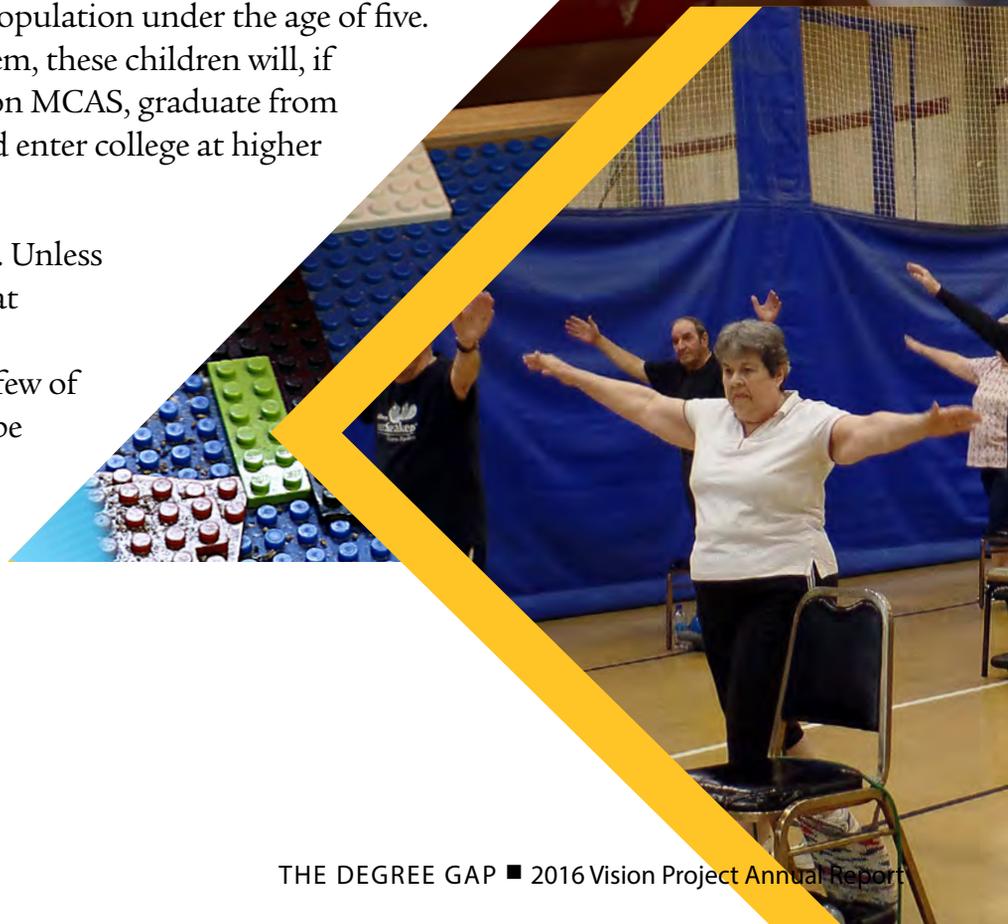
Facing the FUTURE



EVERY PICTURE TELLS A STORY—
and these preschoolers in class
at the **East Boston YMCA** tell an
important tale about
Massachusetts' future.

They represent the African American and Latino/a children who now comprise 30 percent of the state's population under the age of five. As they pass through the K-12 system, these children will, if recent trends hold, perform better on MCAS, graduate from high school in greater numbers, and enter college at higher rates than ever before.

There, the good news typically ends. Unless current rates of degree production at Massachusetts public colleges and universities improve markedly, too few of the preschoolers pictured here can be expected to earn a college degree, creating an unacceptable loss of brainpower in a state with a voracious need for new college graduates.





FIFTY MILES AWAY
at **Mount Wachusett**
Community College's Fitness &

Wellness Center, another vision
of the state's future dances into view.

Participants in the Silver Sneakers® fitness
program glide across a gym floor in their
Wednesday morning exercise class.

No one in this group has come to campus to study or
earn a degree; the seniors are here to relax and enjoy
themselves after long years in the workforce. In
the next decade their ranks will swell, as an
estimated 660,000 college-educated workers
across Massachusetts retire.¹ →



When we look at demographic changes occurring in Massachusetts, we can see that the current metrics on college completion are certainly concerning, especially in under-represented communities like the ones we serve.”

—VALERIE ROBERSON, PRESIDENT, ROXBURY COMMUNITY COLLEGE

Massachusetts’ Changing Demographics

Combined with a seven percent decline in the state’s population of high school graduates, these trends impacting the state’s youngest and senior citizens offer extraordinary challenges for a public higher education system that now educates more than half of all undergraduates—and more than 70 percent of Latino/a and African American students seeking college degrees.

“When we look at demographic changes occurring in Massachusetts, we can see that the current metrics on college completion are certainly concerning, especially in under-represented communities like the ones we serve,” said **Valerie Roberson**, president of **Roxbury Community College**. “At RCC and other campuses that serve our neediest students, we’re working to address the barriers that typically prevent completion.”

Although Massachusetts prides itself on being the state with the most adult degree-holders—51.5 percent of adults ages 25–54—research conducted by the Department of Higher Education shows that demographic changes are taking a toll. **By 2022, the overall rate at which young residents earn college degrees will pivot from growth to decline unless the public higher education system can find ways to raise college completion rates for all students, including those from underserved populations and communities.**

Already, the demand for qualified graduates with degrees in high-need fields such as computer science and nursing has begun to outstrip supply. “Massachusetts’ population projections and educational attainment rates portend critical shortfalls in the supply of labor needed to sustain the state’s leading industries,” declares the *Workforce Innovation and Opportunity Act (WIOA) Massachusetts Combined State Plan*, the state’s official workforce plan released in spring 2016. The warning echoes the finding of a 2014 report from MassINC and the UMass Donahue Institute, which predicted that, for the first time since data was collected, “Massachusetts will end a decade with fewer prime working age college-educated residents than it (started) with.”²² →

Where the Gaps Are

In Massachusetts cities, there is a strong correlation between low rates of bachelor’s degree attainment and high rates of unemployment.

Source for City Populations & Share of Population 25 Years and Older with a Bachelor’s Degree: American Community Survey 2010–14.

Source for Unemployment Rate: Executive Office of Labor and Workforce Development (EOLWD), Labor Market Information, March 2016.

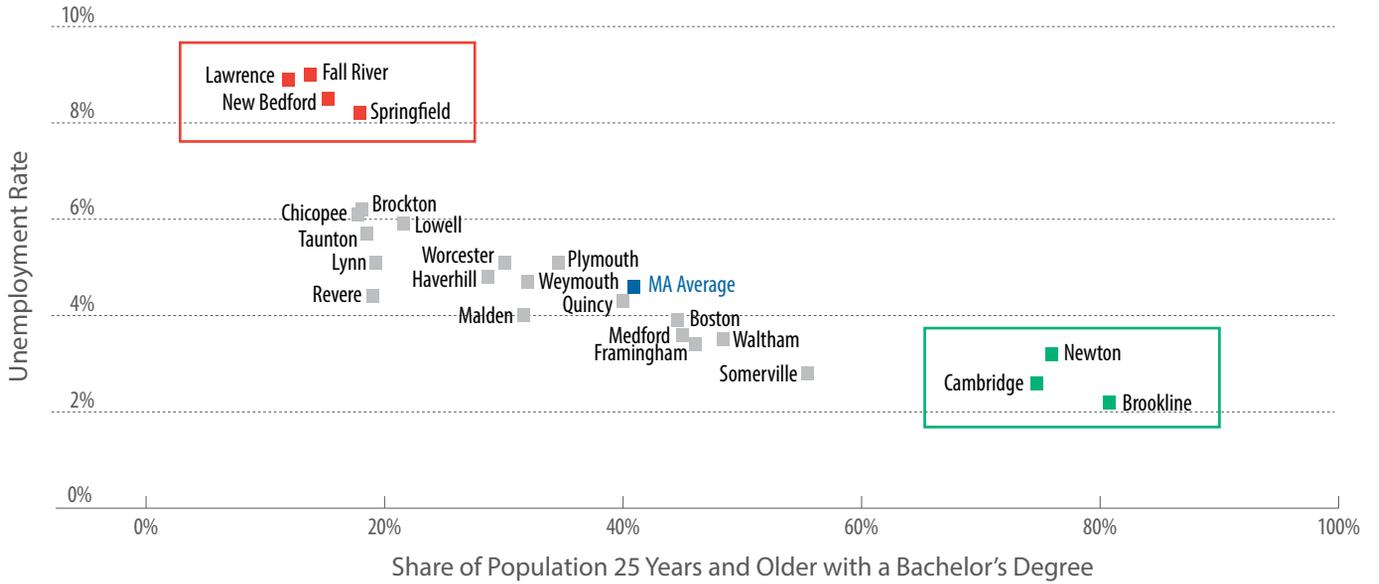
Across all segments of Massachusetts public higher education, White female and White male students consistently have the highest graduation rates compared with Latino/a and African American peers, while Latino males and African American males have the lowest. While graduation rates for some African American and Latino/a subgroups are improving, the disparities remain significant.

Community Colleges Cohort: First-time, degree-seeking students entering in fall 2008; measure examines their rate of success by September 2014. Trend data compares rates for students entering fall 2004–2008 and graduating by fall 2010–2014 respectively. Source: MDHE, NSC.

State Universities & UMass Cohorts: First-time, full-time, degree-seeking students entering in fall 2006–2008; measure examines their rate of graduation within six years of initial enrollment by 2012–2014. Trend data compares three-year averages for students entering fall 2002–2008 and graduating by fall 2008–2014 respectively. Source: USDOE/IPEDS.

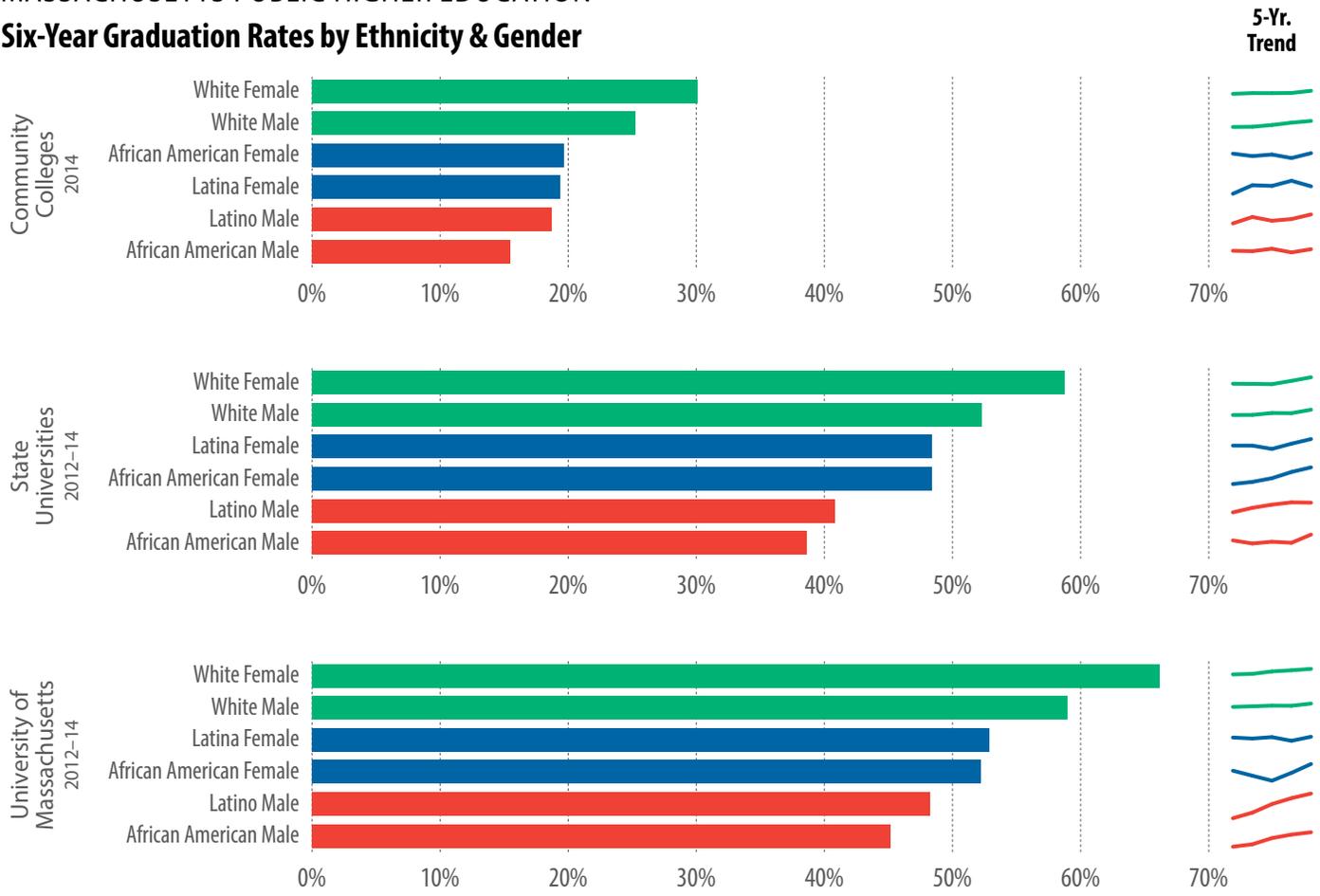
25 MOST POPULOUS CITIES IN MASSACHUSETTS

Unemployment Rate vs. Educational Attainment Rate



MASSACHUSETTS PUBLIC HIGHER EDUCATION

Six-Year Graduation Rates by Ethnicity & Gender



Projected Workforce Shortages— Primarily at Baccalaureate Level

In last year's *Degrees of Urgency* report, the Department of Higher Education projected that by 2025, the state's community colleges, state universities and campuses of the University of Massachusetts would fall short of producing their share of the state's much-needed new college degrees by a minimum of 55,000 to 65,000. **This year, a more detailed analysis shows that 80 percent of those lost degrees will be at the baccalaureate level or higher.**

The specific nature of the Massachusetts economy, with its rapid job growth in health care and science, technology, engineering and math (STEM) fields, helps explain the state's outsized need for more highly educated graduates. An analysis of online job data by the Georgetown University Center on Education and the Workforce shows that Massachusetts leads the nation with 63 percent of its online job postings requiring a four-year degree or higher.³

The size and depth of the Commonwealth's talent pool has direct bearing on the strength of its economy. In February 2016, the New England Economic Partnership forecast that, by 2018, Massachusetts' economic growth rate would drop by half, from 3% to 1.5%, precisely because the state will not produce enough college-educated workers to fill jobs in high-demand industries. Perhaps not surprisingly, Massachusetts communities with the lowest percentages of college-educated workers—Springfield, New Bedford, Lawrence, Fall River—have the state's highest unemployment rates (see graph on page 7).

"Massachusetts is in the midst of its most robust economic expansion of the century, but to date the benefits of this economic growth have yet to be experienced in any meaningful way by our regions outside of Greater Boston," observes **Michael Goodman**, professor and executive director of the Public Policy Center (PPC) at **UMass Dartmouth** and co-editor of *MassBenchmarks*, the journal of the Massachusetts economy published by the UMass Donahue Institute in cooperation with the Federal Reserve Bank of Boston. "In particular, our urban communities and the young and the poorly educated are growing more and more disconnected from our economy and society, and we are paying an increasingly high price for this divergence of destinies. Our aging population and slow-growing labor force are expected to curb job growth significantly in coming years. This makes closing the achievement gap and improving access to affordable and high-quality higher education an essential economic and social imperative."

“If we cannot continue to provide the skilled workers that our growing employers demand, they will look elsewhere and the state economy and its working families will be the poorer for it.”

—MICHAEL GOODMAN, EXECUTIVE DIRECTOR, PUBLIC POLICY CENTER, UMASS DARTMOUTH; CO-EDITOR, MASSBENCHMARKS JOURNAL

“FACING THE FUTURE” SOURCES

¹ Massachusetts Department of Higher Education (MDHE) analysis of 2012 American Community Survey and 2012 BLS Labor Force Projections (*BLS Monthly Labor Review*, December 2013).

² MassINC & UMass Donahue Institute, *At the Apex: The 2030 Educational Attainment Forecast and Implications for Bay State Policymakers*, September 2014.

³ Burning Glass job data 2013 Q2.

⁴ MDHE; National Student Clearinghouse. Calculations by MDHE.

⁵ MDHE, *Technology Talent Initiative Workforce Plan*, 2014.

System Leaders in Raising College Completion Rates

Eight of the 28 public undergraduate campuses have met or exceeded the ambitious Vision Project goal of an annual one percentage point improvement in six-year graduation/success rates and have sustained such growth for the past five consecutive years:

Bridgewater State University

Massachusetts College of Art & Design →

Massachusetts Maritime Academy

North Shore Community College →

UMass Amherst

UMass Boston

UMass Lowell

Worcester State University

Methodology: For community colleges, analysis compared single-year success rates from the entering cohort of fall 2003 through the entering cohort of fall 2008. For the state universities and UMass, analysis compared six successive rolling averages from the entering cohorts of fall 2001–2003 through the entering cohorts of fall 2006–2008. Rolling averages were used where available to moderate the impact of any inconsistent one-year spikes or dips in the data.



Progress, But Not Enough

For graduates holding college credentials, employment prospects are strong. But for students who never earn their college diplomas, the best-paying jobs and most fulfilling opportunities remain well beyond reach. In particular, college graduation rates for students of color remain troublingly low, with little system-level change over the years. **In Massachusetts, 79 percent of Latino/a undergraduates and 72 percent of African American undergraduates attend a public college or university; yet six years after beginning their studies, less than one third of these students earn college credentials.**⁴

“These gaps on their own are a non-story,” says Michael Collins, associate vice president for postsecondary state policy at **Jobs for the Future**. “They’ve been there since Brown versus the Board of Education; we see them in every state, every year. The real story is whether there is actual intention at the state level to close them. Who are the outliers, the deviants who are having success in closing gaps? That’s where we need to look, to see progress.”

In the all-important tech sector, another degree gap is visible along gender lines, creating a further drag on hiring within the industry. Only one in five students earning a

degree in computer science or information technology from a public college or university is female.⁵ (Learn more in the *Demand for Diversity* story beginning on page 16.)

Thanks largely to a boomlet of millennials, Massachusetts public colleges and universities were able to expand baccalaureate degree production by a robust annual average of 4.6 percent from 2011 to 2015. But the number of students who actually finish college—while improving at many individual campuses—is not growing fast enough to offset the overall degree shortage facing the Commonwealth. Meanwhile, low college completion rates for students of color and low-income students continue to exacerbate degree shortages, limiting both human and economic potential.

“If we cannot continue to provide the skilled workers that our growing employers demand, they will look elsewhere and the state economy and its working families will be the poorer for it,” Goodman emphasizes. “In short, we can no longer afford to leave any of our people or communities behind. Extending more and better educational opportunities to our workers and their families is a no-brainer in an economic environment where we rely so critically on our highly skilled workforce and our world-class innovation economy.” ■

Scale Matters

BY CHRIS GABRIELI



Chris Gabrieli is chair of the Massachusetts Board of Higher Education. He is the co-founder of three non-profit education innovation and reform initiatives and a lecturer at Harvard University's Graduate School of Education.

T HIS YEAR'S VISION PROJECT REPORT FOCUSES ON AN ATTAINMENT GAP

that we can see emerging and growing as we look to the horizon. Even in America's leading higher education state, the number of residents attaining a four-year baccalaureate credential lags significantly current demand by employers for those skills, and the gap will grow considerably in the years ahead unless we successfully adjust our course, **in scale**.

There are literally dozens of exciting and intriguing model programs across our 29 campuses, each worth celebrating for the effort and the anecdotes of success. But there is a worrisome lack of scale to the work, taken as a whole.

I have seen this tendency towards exciting, promising but small-scale and often unsustainable programs addressing major needs throughout my career in K-12 education. I think it may even be more the norm in higher education. Because K-12 systems are obliged to educate all students in their catchment areas and students are legally obliged to attend school until they are 16, system leadership is held accountable across the board. By contrast, higher education is voluntary and students choose the schools they attend. Further, Massachusetts has one of the nation's more decentralized higher ed systems with most of the decision making taking place at each campus. No one among us is clearly responsible for the sum of the parts.

I would point to three main issues we must face if we are really serious about taking the most promising practices to scale to the extent needed by our Commonwealth. Firstly, we should

There are literally dozens of exciting and intriguing model programs across our 29 campuses, each worth celebrating for the effort and the anecdotes of success. But there is a worrisome lack of scale to the work, taken as a whole.

only start experimental programs aimed at addressing large-scale problems with a plan for success and for failure. Many will struggle or fail—we should expect that when we try new things—and our goal should be as much to learn from our efforts as to hope we find quick success. Programs should rapidly evolve based on evidence and be improved or shut down. Equally importantly, we should define in advance the level of success sufficient that we would not only sustain the program but shift it from experiment towards mainstream.

That's where change will always hit the real hurdle for scale—to do more of something new in scale will require doing less or even abandoning some of our old ways of doing things. And there are guardians of the status quo and changeover costs that will resist that conclusion. For example, even as we are in the midst of very promising experiments with changing our approach to assessing which students are ready for

At Scale... At What Cost?



‘Mainstreaming’ successful experiments is very costly. If they have proven their worth, these programs should be eligible for funding that will make it possible to take them to scale in a fashion that doesn’t water down the model in order to account for the increased expense. Many small-scale experiments fall apart when they ramp up, not because they couldn’t be successful, but because the implementation at scale is done without level amounts of per capita funding.”

—KATHERINE S. NEWMAN, PROVOST & SENIOR VICE CHANCELLOR FOR ACADEMIC AFFAIRS, UMASS AMHERST

college-level courses, many campuses continue to use Accuplacer as well and many high schools don’t know that the colleges their graduates are most likely to attend now often value GPA and courses taken over Accuplacer scores. While the period of experimentation is not yet complete, every campus and the DHE should be preparing a plan that we will implement if the experiments continue to succeed where we can rapidly change over entirely to a new, better paradigm. Ending a remediation approach which has far too rarely succeeded and trapped thousands of students every year who never go on to degree completion should be very high on our list of areas where scale will matter.

Finally, we need leadership at both the system and campus levels who are able to provide adaptive leadership where it is needed. Leadership gurus define adaptive leadership as the approach needed for thriving in challenging environments “when you realize that your organization’s aspirations cannot be attained through your current approaches” (Heifetz & Linsky). Adaptive leadership focuses on helping organizations diagnose the structures that worked under past conditions but are now barriers to the changes we need.

Large-scale change and gains cannot happen without adaptive change. What worked to make us the leading state in the nation for higher education won’t alone be enough to support the level of success we need in this century. We need the experiments, the commitment to scaling what works and the adaptive leadership such an odyssey will require. Our students, our society and our industry, together truly our Commonwealth, demand no less of us. ■

A photograph of students in a classroom or computer lab, with large text overlaid. The text reads "A SHORTAGE OF CAPACITY" in large, bold letters. The word "A" is white, "SHORTAGE" is black, "OF" is white, and "CAPACITY" is red. The background shows students working at computers, with a blue Apple laptop visible in the foreground.

A SHORTAGE OF CAPACITY

In two high-demand fields—nursing and computer science—Massachusetts faces critical shortages of college graduates trained at the baccalaureate level or higher.

GIVEN MASSACHUSETTS' RISING NEED FOR MORE NURSES AND COMPUTER SCIENCE PROFESSIONALS, a reader might assume that public college and university programs to prepare graduates for these careers would expand to meet demand. In some cases, there is room to grow. Elsewhere, public campuses report that their programs are at or beyond capacity. At the same time, financial pressures on students are slowing their progress toward degree completion.

Nursing Programs: Nowhere to Grow

According to IPEDS data, Massachusetts' public colleges and universities increased the number of graduates with bachelor of science in nursing (BSN) degrees by 34 percent between 2010 and 2013. They did so primarily by focusing on an incumbent workforce with LPN, ADN or RN degrees, nurses seeking a higher level of education and training to stay abreast of changes in the increasingly complex health care field. Massachusetts has set a goal to increase the number of nurses with BSN degrees from 55 to 66 percent by 2020.

But attaining the goal may prove challenging. Take the **University of Massachusetts Boston**, for example. It graduates more students with BSNs than any other college or university, public or private, in the state. But its programs are at capacity and unable to grow further, due in part to a stagnating pool of clinical placements.

"All of the universities are competing for the same placement experiences for students," says **Marion Winfrey**, associate dean of the College of Nursing and Health Sciences at UMass Boston. "We're held up because there are not enough placements—and without a placement, there is no getting through the program."

As profit margins in the health care industry have tightened, pressures to limit or charge for clinical placements have grown—not only in Massachusetts but in other states as well. "You are down the cost of a Medicare reimbursement," Winfrey explains, "because you can't do four 15-minute appointments back to back with a student nurse in tow."

Indeed, clinical placement data from the Massachusetts Centralized Clinical Placement Management System, a web-based program for scheduling and managing clinical education placements, shows that health care organizations in the Commonwealth are beginning to decline a



Seeking Cure for Clinical Woes. A shortage of clinical placement seats is becoming a drain on nursing program capacity statewide. (Top) Students in UMass Boston's BSN program celebrate a much sought-after clinical placement at Massachusetts General Hospital in Boston. (Bottom) A Salem State BSN student gets clinical experience working with a simulation manikin; there is one available for every 100 students in Salem's program.

higher percentage of requests for clinical placement than in prior years. While the actual number of placements is holding steady or even on the rise, the data suggest that is because campus nursing programs are working harder and digging deeper to find clinical placements for students—not because more such placements are available.

The **University of Massachusetts Lowell** has found one solution: its move to offer clinical placements in the summer has helped the University double its nursing program capacity.

Campuses are also using simulation labs and patient manikins to create an alternative clinical placement experience for students. At **Salem State University**, there is one sim lab with four manikins and two additional manikins in a makeshift lab—serving an undergraduate nursing program of more than 650 students. →



← FROM PAGE 13

Like UMass Boston and Lowell, Salem State's nursing program is highly competitive and also "at its limits in terms of classroom and science laboratory space," according to **Neal DeChillo**, Salem's Dean of Human Services. In fall 2016, Salem State's program received 1,165 applications for admission and accepted just 235 students. University staff, also struggling with the issue of clinical placements, are advocating for a higher-quality simulation environment.

"None of our (current) manikins can be used for a sophisticated sim lab experience," says Salem's provost, **David Silva**.

Salem nursing staff envision a new sim lab that could serve as a community resource, providing ongoing professional development for nurses at area hospitals and health care centers. For now, they describe themselves as "pretty desperate" in hunting for space.

"We're working with one of the local high schools to take advantage of space in their chemistry lab for classes, which sends a curious signal to Salem State students who went there," says Silva, noting that most students would expect to find more advanced facilities on a college campus than at the high school they attended.

UMass Boston's Winfrey estimates that up to 50 percent of their clinical placements could be replaced by simulation, but only if another problem is addressed: the need to hire computer-savvy nursing faculty with the skills needed to oversee the new high-tech environments.

Two-thirds of the UMass Boston nursing faculty will retire in the next five years; at Salem State, half the faculty will leave. Such a predicament is fairly typical; statewide, the average age of a nursing professor is 55, according to the

American Association of College of Nursing. Most nursing instructors are women who earn their Doctorate of Nursing Practice (DPN) degrees relatively late in life, at an average age of 40, having first taken time to work in the clinical field or raise children. UMass Boston is using grant funds to "fast track" students from BSN to DPN degrees; nonetheless, students often scale back to part-time status because of financial pressures.

"I've lost students because they are obligated to send money home to family in Haiti, and they need to work more and can't afford to stay in school," Winfrey says. She worries that the sheer volume of students makes it difficult to help those who are struggling to cope with multiple demands from family, employers and the academy.

"In our nursing lab we are working at 117% capacity. That is not the way to prevent students from dropping out. You can't give all your students the help they need at that capacity level."

Computer Science & IT Programs Full

In the red-hot Massachusetts technology field, meanwhile, there are 17 jobs for every one graduate with a degree in computer science or IT, according to the *Technology Talent Initiative Workforce Plan* released by the DHE in 2014. The report found a "critical gap between the number of degrees granted in computer science and information technology at our public institutions and the current and projected growth in jobs requiring those credentials." The report suggested that degree-granting in these fields would need to double to meet employer demand.



High-Tech Faculty in High Demand. A packed classroom at UMass Amherst's new College of Computer Science is symptomatic of the struggles that computer science and IT programs face given capacity issues.

But the reality on the ground suggests that there are serious challenges to meeting that goal. At several UMass campuses, highly regarded programs to train the next generation of computer science and IT professionals are at capacity and looking for ways to increase the number of students they can serve.

The computer science program at the **University of Massachusetts Amherst** is ranked 25th by *U.S. News and World Report*, tied with Duke University and the University of North Carolina at Chapel Hill. In the last few years, however, the number of admits has roughly doubled, and classes are at their limit. “We can’t hire faculty fast enough,” says **Jack Wileden**, associate dean of student affairs in the new College of Computer Science.

At UMass Lowell, the online information technology program has seen dramatic growth in recent years, leading the university to begin planning for a traditional on-campus day program in IT to accommodate more students. To address the need for more faculty, the University sought and won a contract amendment which allows for the hiring of full-time, non-tenure track lecturers and clinical faculty who are fully focused on teaching and service, rather than research. The benefits are two-fold: they allow the university to improve its retention and graduation rates while also adding faculty positions to high-demand programs.

“We’re letting STEM and health care programs grow disproportionately,” says **John Ting**, UMass Lowell’s vice provost for enrollment, explaining that the University is striving to meet employer demand in key fields.

“We can’t hire faculty fast enough.”

—**JACK WILEDEN, ASSOCIATE DEAN OF STUDENT AFFAIRS, COLLEGE OF COMPUTER SCIENCE, UMASS AMHERST**

computer science/IT departments are facing some of the same issues that nursing programs are struggling with, plus some unique challenges:

- **Infrastructure:** Unmet computer hardware and software needs, which must be updated regularly due to the pace of technological change.
- **IT staffing:** Some campuses report not having sufficient IT staff to manage the technology necessary in Computer Science programs.
- **Student retention:** Computer Science is one of the toughest majors on any campus, due in no small measure to the amount of math that’s required.

Bridgewater State University has used a National Science Foundation grant to support student success in computer science and other science programs.

“Before, we were losing up to 50 percent of our students across the board, across all demographics,” says **John Santore**, chair of the computer science department at Bridgewater. “We added support structures for students; overall I’d say our failure rates in the entry-level Computer Science courses have dropped down below 20 percent.”

Could Bridgewater double the number of computer science graduates to meet industry need, as called for in the *Technology Talent Initiative Workforce Plan*? “No, but we could probably go another 20 percent,” Santore says, noting that the program has seen steady growth in recent years and has just added an eighth full-time professor. “The problem is that Bridgewater has no space.” ■

The Demand for

DIVERSITY

Tech Sector Seeks to Expand Talent Pool with Diverse Hires

AT THE CHELMSFORD HEADQUARTERS OF WORKFORCE MANAGEMENT COMPANY KRONOS,

an employee time clock in the company's lobby recently became the center of the universe for 10 UMass Lowell co-op students. The students were charged with reimagining the ubiquitous device, making important connections between innovation and its real-world applications and impact through that process. For **Kronos**, the project and the co-op partnership with **UMass Lowell** illustrates the value of diverse perspectives in promoting the company's technical and business objectives.



Diverse Hiring = Strategic Thinking. Kronos values the different perspectives that a diverse pool of employees bring to product development. Thirty-two percent of the UMass Lowell interns they selected this year are students of color, and 26 percent are women.

“Everything we do, from volunteerism to charitable giving, is about engaging the next generation of our workforce,” says **Barbara Vlacich**, Kronos’ vice president of presales operations and sales effectiveness. The company’s leaders believe that diversity in its workforce is a strategic imperative, tapping partnerships like the one with UMass Lowell, along with internal and external programs, to bring a diverse pool of candidates to Kronos’ doorstep. Within this year’s co-op class, nearly 32 percent are students of color, and 26 percent are women.

“As the workforce continues to change, our products must evolve with it—and this evolution makes it critical for Kronos and tech companies like ours to have a diverse pool of employees who bring different backgrounds and perspectives to product development,” continues Vlacich. “These different perspectives help us best meet the needs of our customers and their diverse workforces.”

The approach also helps the company to fill key long-term workforce positions; of the 40 interns Vlacich has hosted within her department alone, half have become permanent Kronos employees.

Filling the Talent Pool: Simple Arithmetic

Scores of data reinforce the hiring challenge in computer science-related fields. Juxtaposed with the 12,000 unique job ads posted for Massachusetts IT positions (Help Wanted Analytics), the 3,848 computer science/information technology degrees granted by Massachusetts’ public and private institutions in 2014 simply aren’t enough to meet demand.

Kronos’ focus on diversity is becoming a common refrain throughout Massachusetts’ innovation sector. From technology-reliant industries to health care fields like nursing and life sciences, organizations in the Commonwealth have acknowledged that they simply cannot maintain the workforce they need to deliver the products and services their brands promise without expanding the pool of diverse applicants. Yet across the state, the interest and participation in these fields among female students and students of color, although rising, remains low. On Massachusetts’ public campuses, just 15 percent of students in computer science programs are women, 10 percent are African American and 13 percent are Latino/a.

“We just can’t afford to leave people on the sidelines if we want to compete as a region in the global battle for technology talent,” says **Tom Hopcroft**, president and chief executive officer of **MassTLC**, whose 2020 Challenge initiative has set a goal of creating and filling 100,000 new tech sector jobs in Massachusetts by 2020. Hopcroft, who is also a →

MASSACHUSETTS PUBLIC
HIGHER EDUCATION

Lack of Diversity in Computer Science

FEMALE STUDENTS REPRESENT:

15%

of students enrolled in
computer science majors

21%

of computer science graduates

AFRICAN AMERICAN
STUDENTS REPRESENT:

10%

of students enrolled in
computer science majors

7%

of computer science graduates

LATINO/A
STUDENTS REPRESENT:

13%

of students enrolled in
computer science majors

11%

of computer science graduates

Source for enrollment in major: MDHE, Fall 2015 data.

Source for graduates: MDHE, FY2015 data for certificates, undergraduate & graduate degrees.

member of the Massachusetts Board of Higher Education, points out that the data illustrating the state's pipeline challenges do not even account for the economic loss incurred as leading technology companies unable to fill positions here relocate or expand their presence in other states.

Diverse Products Demand Diverse Perspectives

For Massachusetts' technology-driven companies, however, the "talent gap" challenge extends far beyond the simple math of filling empty desk chairs with qualified workers. The benefits of a diverse workforce, they say, impact their very ability to create the kinds of products and services that consumers want and need. "As a company, we believe that in order to serve our customers well, we need a workforce that reflects multiple sets of interests and experiences," says **Annamarie Levins**, general manager for technology & civic engagement in the Cambridge office of **Microsoft**. "As our workforce has become more diverse, we've been able to build better products by being more sensitive to people's needs—and most companies in the tech sector understand that."

“If you don't have women and underrepresented populations involved in designing systems, you won't have systems that are friendly for all users.”

—**RICK ADRIAN, PROFESSOR EMERITUS, UMASS AMHERST; PRINCIPAL INVESTIGATOR, COMMONWEALTH ALLIANCE FOR IT EDUCATION**

Indeed, as the applications of technology continue to proliferate, the need for diversity among those developing the applications is expanding. "If you don't have women and underrepresented populations involved in designing systems, you won't have systems that are friendly for all users," says **Rick Adrion**, professor emeritus at **UMass Amherst** and principal investigator of the **Commonwealth Alliance for IT Education** (CAITE), whose mission is to broaden participation in computing and IT. "You'll have tools created by someone who grew up on computer games, that aren't necessarily intuitive for the broader community."

This need for greater diversity at the product innovation level is well documented; the notion of the "sameness barrier" created by a homogenous workforce is often implicated as preventing truly disruptive innovation that leads to new and better products. Yet the same technical ubiquity that

impacts our daily life is also at play throughout the workforce, demanding that employees at all levels of an organization, regardless of position, come equipped with technical skills.

"Here at Kronos, you'd be hard pressed to find a job that doesn't rely on technology and require our employees to have a vast skill set," says Vlacich. A focus on cultivating technical talent and interest among diverse candidates at all levels, then, becomes an economic imperative if Massachusetts' companies and economy are to thrive. This includes the "middle skills" demanded within roles that are the backbone of technology careers but require less than a four-year degree to attain. According to the Harvard Business School, 69 percent of HR executives say their inability to attract and retain middle-skills talent frequently affects their firm's performance.

Linking College and Career

Kevin Burns, chief information security officer for the Commonwealth of Massachusetts, is personally engaged in work to spread the word about opportunities in the fast-growing cyber security field, where the educational

threshold for career entry begins at community colleges. This is also where the majority of students of color in the public higher education system are clustered.

“We need tactical roadmaps to recruit and retain people from underrepresented populations and help them become almost instantly successful in these careers,” says Burns. “There is so much opportunity.” With a certificate, people can secure well-paying jobs at firms that often fund public associate and baccalaureate programs for employees with support from the state. Burns is working as part of an advisory panel for **MassBay Community College**, helping to shape the curriculum for its cyber-security certificate program.

Similar efforts are underway at other community colleges and at the **University of Massachusetts Boston**, where **BATEC** (Broadening Advanced Technological Education Connections), funded by the National Science Foundation, is working with academic partners to develop curriculum and examine pathways in computing and IT that lead students from high school through college to careers. Part of that work, says **Deborah Boisvert**, principal investigator and executive director for BATEC, is simply familiarizing students with the college environment. “It’s about helping students whose parents didn’t attend college to simply have the confidence to walk onto a college campus,” she says. “And then it’s about helping them understand that within four or five courses, they’ll be employable.”

This same message is being spread through efforts at the company level throughout the Commonwealth, where co-op, intern and mentoring programs are helping to engage the diverse groups of potential employees the companies say they need.

At the Cambridge office of Microsoft, the company’s 12-week “Explore Microsoft” internship program provides hands-on training, mentoring and group project experience for freshman and sophomore college students, and encourages applications from underrepresented groups including women and minorities. The local Women@NERD and Blacks and Africans at Microsoft groups hold mock interview and mixer events for underrepresented students.

The popularity of one of these recent mock-interview recruiting events hosted through Blacks and Africans at Microsoft offers encouraging data that these efforts are gaining traction. The 60 slots available for the event, advertised through student groups at institutions where employees hold connections, were filled in just one week.

“Internships and other hands-on experiences help students find their way to career options they wouldn’t otherwise know about,” says Tom Hopcroft. “Once the students are plugged in with these companies and opportunities, they reach out and help more students find jobs by showing them what is possible.” ■

MASSACHUSETTS PUBLIC HIGHER EDUCATION

Lack of Diversity in Information Technology

FEMALE STUDENTS REPRESENT:

22%
of students enrolled in IT majors

21%
of IT graduates

AFRICAN AMERICAN STUDENTS REPRESENT:

14%
of students enrolled in IT majors

10%
of IT graduates

LATINO/A STUDENTS REPRESENT:

15%
of students enrolled in IT majors

11%
of IT graduates

Source for enrollment in major: MDHE, Fall 2015 data.

Source for graduates: MDHE, FY2015 data for certificates, undergraduate & graduate degrees.

Honing IN

Massachusetts' public colleges and universities and the DHE are sharpening the focus on three key areas of the Vision Project to address the Degree Gap.

THROUGH THE VISION PROJECT, MASSACHUSETTS' PUBLIC COLLEGES AND UNIVERSITIES HAVE BEEN WORKING TO IMPROVE college completion rates and other performance outcomes with the goal of producing “the best-educated citizenry and workforce in the nation.” With this report, the Department shifts attention to three of the seven areas of the Vision Project, each central to the goal of reducing or eliminating the Degree Gap.

“While the Vision Project remains the Board-approved agenda for higher education, I believe we need to ‘hone in’ on these three priorities and also include more direct emphasis on affordability,” said [Commissioner Carlos E. Santiago](#). “Workforce alignment runs as an undercurrent though this more tightly focused agenda, the goal of which is to improve our rates of degree completion. Students, and the employers who are waiting to hire them, are counting on us to achieve faster, more far-reaching results.”

“Drilling down on these three priorities will be essential if we are to hasten the pace of progress,” said Board of Higher Education [Chairman Chris Gabrieli](#). “Campuses are going to need to work more closely in regional partnerships and find creative, meaningful ways to bring best practices to scale if we are to realize system-level progress.” ■

The “Big Three” Degree Plan



Improve College Access & Affordability

- Expand dual enrollment and STEM early college opportunities
- Promote “knowledge about college” through high school partnerships, events
- Create more affordable pathways to—and through—college

LEARN MORE

“Dual Enrollment Partnerships Open Doors” on page 24
“STEM Starter Academy Students Finish Big” on page 26
“MetroWest College Planning Center” on page 22
“GEAR UP and Sign Up for College” on page 29
“The Commonwealth Commitment” on page 23



Close Achievement Gaps

- Increase support to and expand opportunities for low-income male students and male students of color who are at risk of not entering or finishing college

LEARN MORE

“100 Males Pilot Programs Launch” on page 32
“Cohort-Based Support Models Spell Success” on page 34



Raise College Completion Rates

- Overhaul developmental (remedial) education programs
- Expand use of retention software and student support/advising
- Map seamless, statewide transfer pathways from two-year colleges to four-year universities

LEARN MORE

“Breaking Remedial Math Barriers” on page 40
“Excelencia in Education” on page 35
“Blazing New Transfer Pathways, Discipline by Discipline” on page 38



*** All strategies aligned with workforce needs**



Improving College Access & Affordability



Never Too Early. Framingham State University sophomore Deron Hines (lower right) welcomes Woodrow Wilson Elementary School students to the College Planning Center's "College for a Day" program.

MetroWest College Planning Center

MASSBAY, FRAMINGHAM STATE BUILD COLLEGE KNOWLEDGE



MassBay Community College and **Framingham State University** used a Vision Project Performance Incentive Fund (VP-PIF) grant to open the Commonwealth's first regional college planning center with the goal of achieving higher rates of college access and completion among underrepresented groups across MetroWest.

"I always say talent is distributed equally, opportunity is not,"

Framingham State President **Javier Cevallos** said at the opening of the MetroWest College Planning Center (CPC) in September 2015. "I am optimistic about this center in making a big difference in the opportunity for people in this region." ■

In its first year, the MetroWest CPC has had the following impacts:

- Engaged 2500 MetroWest residents in services and trainings.
- Provided 58 hours of professional development to K-12 guidance teams, adult basic education coaches, and college access counselors.
- Partnered with 16 community agencies and six school districts partnered with the CPC on college access/success programs.
- Helped launch the DHE's 100 Males to College program for male students attending Framingham High School and Keefe Regional Technical School. For more on the 100 Males to College initiative, please see page 32.



Eligible Majors

For transfer to most State Universities & UMass Campuses

- Biology*
- Business⁺
- Chemistry*
- Communications & Media Studies⁺
- Computer Science⁺
- Criminal Justice⁺
- Early Childhood Education⁺
- Economics*
- English⁺
- History*
- Liberal Arts⁺
- Mathematics⁺
- Political Science*
- Psychology*
- Sociology⁺
- STEM Natural/Physical Sciences⁺

For transfer to Massachusetts College of Art & Design

- Painting*
- Printmaking*
- Sculpture*

For transfer to Massachusetts Maritime Academy

- Emergency Management*
- Energy Systems Engineering*
- Facilities Engineering*
- International Maritime Business*
- Marine Safety & Environmental Protection*

* Becomes eligible in Fall 2016

⁺ Becomes eligible in Fall 2017

**MORE INFO AT
WWW.MASS.EDU/MACOMCOM**

Signing on the Line. On behalf of all 25 Massachusetts public college and university presidents, (seated from left) Barry Maloney, Worcester State University; Marty Meehan, University of Massachusetts; and James Mabry, Middlesex Community College, sign the Commonwealth Commitment agreement, while Commissioner Santiago (right) looks on.

The Commonwealth Commitment

HIGHER ED LEADERS SIGN HISTORIC PACT

In a systemwide effort to advance the “Big Three” goals, the campuses and DHE have announced the new **Commonwealth Commitment to College Access, Affordability and Completion**. In less than six months, campus leaders, faculty and staff forged agreement on a groundbreaking plan to freeze college costs, offer end-of-semester tuition and fee rebates and, at the four-year institutions, waive tuition. Students must begin their studies at a community college and then transfer to a state university or UMass campus. They must attend full-time, maintain a cumulative GPA of 3.0 and complete their bachelor’s degree in less than four and a half years.

“This program was designed to decrease the cost of a college degree and accelerate on-time completion for students across the Commonwealth, creating more opportunities and helping more people get into the workforce with the skills they need,” said **Governor Charlie Baker**.

“The Commonwealth Commitment will make it even easier for students to go to school full-time and begin their careers with less debt, and we are pleased that our higher education officials have worked collaboratively to make this program a reality.”

The two-year pilot program will launch in fall 2016 with students able to choose from 14 MassTransfer Pathways degree programs; ten more programs will be added in fall 2017. See page 38 for more information about the new Pathways. ■



Dual Enrollment Partnerships Open Doors

RENEWED FOCUS ON UNDERREPRESENTED STUDENTS

It's a winning strategy that reduces college costs while also lowering remediation rates:

dual enrollment programs that allow students to take college classes while still in high school.

The **Commonwealth Dual Enrollment Partnership** (CDEP)

provides funds to campuses that help reduce the cost of college coursework. In addition to providing a meaningful and challenging early college experience, research suggests dual enrollment opportunities are associated with higher college enrollment and graduation rates.

Massachusetts has set a goal of increasing dual enrollment from 2,000 to 3,400 students, with a renewed focus on recruiting underrepresented students. CDEP funding increased from \$750,000 in FY15 to \$1 million in FY16.

Meanwhile, campuses are ramping up their own dual enrollment and early college programs, some using private funds to supplement public resources.



North Shore Community College has launched

CommUniverCity at Lynn, an "urban education-workforce development collaboration" that takes a birth-to-career approach to developing educational pathways into higher education and employment. Working with the Lynn Public Schools and community partners, and with funding from



An Alternative Path to College. Holyoke Community College's rigorous Gateway to College program uses the dual enrollment model to offer at-risk students and recent high school dropouts a chance to complete a high school diploma from their home district while also accruing an average of 24 college credits.

the Federal Reserve Bank of Boston, NSCC rolled out an Early College IT Academic Pathway to allow low-income, first-generation college students to progress from high school to NSCC and then on to Salem State to earn a bachelor's degree in information technology. Guided academic pathways in business and early childhood education are planned for next year. The initiative builds on North Shore's existing dual enrollment program at Lynn High, where fully 100 percent of students who enrolled in a college course in 2015 completed and passed it. Ninety-five percent of those students are currently enrolled in their first year of college.

Holyoke Community College has nearly doubled the number of dual enrollment students it serves in the past two years, based on new relationships it has formed with Chicopee Comprehensive High School and Paulo Freire Social Justice Charter School. The College also boasts the nation's #1 Gateway to College program for high school dropouts, with the highest graduation rates of any Gateway program in the U.S. Since fall 2010, 171 students have earned their high school diplomas by taking college classes at HCC.

Massasoit Community College faculty are teaching dual enrollment courses at seven area high schools, up from three schools in 2011. The number of students taking classes has



From the Sea to the City. Students at the John D. O'Bryant School in Roxbury broaden their horizons with a college course in coastal navigation brought to their doorstep by Massachusetts Maritime Academy.

expanded from 81 to 275. **Peter Johnston**, Massasoit's early college partnerships director, recalls a staff person at one local high school telling him that many electives had been eliminated due to budget cuts.

"The administrator was distraught over the potential negative impact to students," Johnston says. **"He asked, 'Can Massasoit help fill that gap?'** So we're now offering statistics, psychology and sociology for his students." Massasoit's broader goal, according to Johnston, is to help area high school students gain developmental skills for college success out of the way in 9th or 10th grade so they are ready to begin credit-bearing college courses in the 11th grade. At that point students may take dual

enrollment classes, so that they can begin their higher education experience earlier.

Massachusetts Maritime Academy has creatively exported its dual enrollment program from its Bourne campus to the **John D. O'Bryant School of Math & Science** in Roxbury. Once each week an Academy faculty member travels to O'Bryant to teach a dual enrollment class in coastal navigation, which also includes two field trips to the Academy. In just its second semester, enrollment has doubled and 98 percent of participating students have received college credit. The Academy and the high school have expanded their partnership to include scholarships to the Academy's summer academic camps. ■

Dual enrollment results in Massachusetts:

- Low-income students who took a dual enrollment course were almost 16% more likely than their peers who had never taken a dual enrollment course to enroll in college.
- Dual enrollment students who enrolled in community college were 50% less likely to require remedial (developmental) classes compared to their peers who had not taken a dual enrollment course.



STEM Starter Academy Students Finish Big

PROGRAM EVALUATION SHOWS PROMISING RESULTS

Among the findings of a recent UMass Donahue Institute evaluation of the STEM Starter Academy program:

- Seventy percent of degrees and certificates completed by SSA participants were in STEM fields. Statewide, only 45% of community college credentials are awarded in STEM fields.
- SSA students enrolled as full-time students at a rate 13 percentage points higher than the general community college student population. **This bodes well for future degree completion,** because full-time students are more likely to earn credentials than part-time students.
- In summer 2015, 40% of SSA students completed developmental (remedial) coursework; of that number, 75% went on to enroll in a credit-bearing, college-level math class in fall 2015. "Statewide, only 20% of community college students who complete developmental math coursework go on to complete a college-level math course within two years," UMDI researchers noted. **"So the high rate of college-level math enrollment is a promising indicator."**



Full Scale. The STEM Starter Academy model was developed collaboratively and implemented by all 15 community colleges, including Quinsigamond (top) and Greenfield (bottom).



The results are in, and the two-year-old **STEM Starter Academy** (SSA) program at all 15 Massachusetts community colleges has shown success in its efforts to recruit, retain and graduate more students with science, technology, engineering and math degrees.

The grant-funded SSA program championed by **House Speaker Robert DeLeo** gives high school students exposure to college-level STEM courses and career tracks. During free summer sessions, students can conquer remedial math coursework, take part in science and engineering challenges such as building digital cameras or genetics labs, and visit industry partners to learn about different STEM careers.

"We created our own oil spills, and then had to be engineers and try to find a way to solve them," said **Erin Holdgate**, who attended **Massasoit Community College's** STEM Starter Academy before entering the college in 2014. Graduating this spring, Holdgate plans to transfer to a four-year university and pursue a career in medicine.

At **Quinsigamond Community College**, coordinator **Darcy Carlson** reports that 23 of the 29 students who took part in the summer program then enrolled QCC and are on track to complete their first year in college. More than half the group have chosen STEM majors. "Some of them are asking me, 'Are you doing it again this year? Can I help?'" Carlson says. "My goal is to double the number of program participants in summer 2016, budget permitting." ■

Expanding Access to Early College

BY JIM PEYSER



Jim Peyser is secretary of education for the Commonwealth of Massachusetts.

FOR MANY HIGH SCHOOL STUDENTS, college and career can seem like distant destinations in an uncertain future. This is particularly true for students without parents or mentors who have already traveled the path; these students are often unaware of the opportunities in front of them, and they doubt their own ability to succeed. A promising approach to changing this dynamic is early college.

Early colleges are more than just dual enrollment, whereby a high school student—typically someone who is already on track to higher education—takes a college-level course for both high school and college credit. Rightly conceived, early colleges are collaborations between high schools and colleges to create structured pathways for a diverse set of students, including students who may not have previously been on a college track, to follow throughout high school and into college. Early colleges set expectations up-front for post-secondary education, while providing supports and experiences to build confidence and ensure success. According to a 2015 study by the Rennie Center, “only 14 percent of early college participants needed remedial work in their first year of college, compared to 23 percent of students nationally.” Also, a 2013 study by the American Institutes of Research found that early college students were significantly more likely to earn a college degree than comparison students (25% vs. 5%).

Typically, early colleges adopt a particular academic theme, in order to provide programmatic coherence and facilitate alignment with college curriculum and standards. Increasingly, this has meant a focus on STEM. Equally important, early colleges seek to establish connections between academic subjects and the world of work, in order to better engage students through the hands-on application of their classroom learning and to prepare them for real job opportunities in their communities. Making early college a career pathway requires a deep and sustained partnership with local employers, who can help design curriculum, provide mentorship for students, and offer workplace learning experiences.

By better integrating Connecting Activities, Dual Enrollment, and STEM Starter Academies, we can leverage public and private dollars to create new early college programs and take this initiative to larger scale across the Commonwealth.

A high priority of the Board of Higher Education, the Board of Elementary and Secondary Education, and the STEM Advisory Council is to expand the number of students who are enrolled in early college programs, specifically those that support career pathways in STEM fields.

We are fortunate that Massachusetts already has several high-performing early college models to learn from, along with non-profit organizations and foundations that are national leaders in the field. In addition, we have a number of existing programs and resources that are already addressing pieces of the puzzle. For example, by better integrating Connecting Activities, Dual Enrollment, and STEM Starter Academies, we can leverage public and private dollars to create new early college programs and take this initiative to larger scale across the Commonwealth.

Early college alone is hardly the answer to the challenges of college access and completion, nor is it a silver bullet to prepare students to be career-ready and to be active and engaged citizens. Nevertheless, our administration is committed to advancing early college programs as part of an effective and scalable strategy for ensuring more students are prepared to succeed in higher education and the workplace. ■



Employers Putting "Skin in the Game" of Workforce Development

FOUR C'S MODEL LEADS TO PAID INTERNSHIPS, TUITION BENEFITS



Like most community colleges, **Cape Cod Community College** had a history of working closely with local employers to align workforce training with hiring needs. But **Tammi Jacobson** had a different vision when she became director of the College's workforce education office. She wanted employers to have "skin in the game," to collaborate with the Four C's to move students out of training programs, into paid internships and eventually, jobs that would offer tuition assistance programs to help students further their education and training.

Rather than serve as an employment agency, Jacobson wanted local companies to have, in essence, an ownership stake in the business of educating the local talent pool. "I wanted them to feel part of the education and training process," Jacobson says. "I said to myself, 'We're going to train the students, and they are going to hire the students.'" To put the new model into practice, Jacobson rebranded the workforce education division into an on-campus organization called the Center for Corporate and Professional Education.



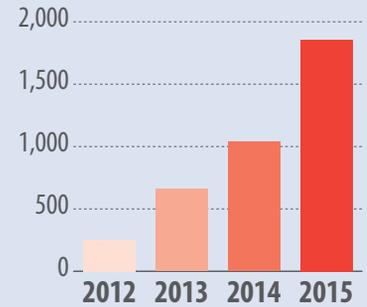
Enter **Charles "Chuck" Robinson** (left), a semi-retired insurance executive and one-time student at the Four C's, who was increasingly concerned about finding job candidates for positions at his own agency and at other agencies across the Cape. He worked with Jacobson to bring ten agencies to the table, forging a partnership that led to the creation of curriculum for entry-level customer service positions. With as many as half of the state's 80,000 insurance employees retiring in the next decade, Robinson sees the program as an employer's lifeline. "The stars lined up on this; I'm hoping we can do it

every summer," Robinson says. **"I had reached out to several other colleges, but Cape Cod was the most responsive."**

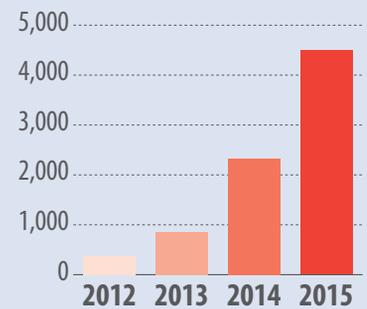
Twenty students signed up for three weeks of classroom instruction, starting in June 2016. Paid internships, complete with individual mentors provided by the companies, will follow. Robinson fully expects that many if not most of the interns will be hired for permanent positions. An added bonus: at least half of the agencies will offer tuition reimbursement to allow the students to continue their students at the Four C's while working. The only downside of the program is space availability: the college only has enough computer stations and workspace to accommodate 20 students at a time. ■

Massachusetts College Application Celebration Outcomes

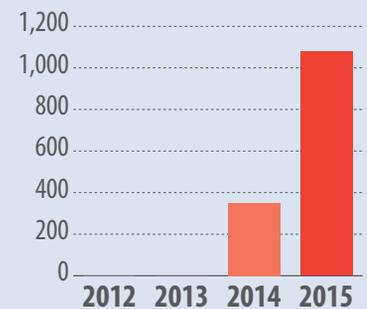
Students Reached



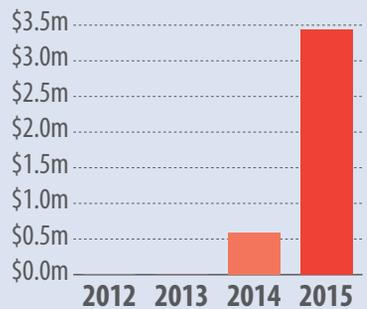
Applications Submitted



On-the-Spot Acceptances



Scholarship Dollars Awarded





It's Party Time! Two high school seniors in Worcester celebrate their on-the-spot acceptances with Kirshner Donis, associate director of admissions at Worcester State University.

GEAR UP and Sign Up for College

ACCESS GROUP HELPS THOUSANDS OF STUDENTS APPLY

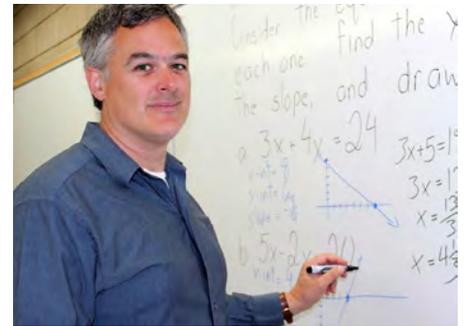
GEAR UP (Gaining Early Awareness and Readiness for Undergraduate Programs) is the Department of Higher Education's largest college access program, providing 7,000 students in seven low-income districts with tutoring services, mentoring, financial aid counseling, educational and college field trips, college readiness workshops and more.

A 2015 study with **Worcester Public Schools** found that graduating seniors who participated in the federally funded GEAR UP Massachusetts program were **nearly four times more likely to enroll in college** than students who did not participate in a college access program.

GEAR UP is now expanding its reach statewide through the **Massachusetts College Application Celebration** (MCAC), the goal of which is to provide every graduating senior the opportunity to apply to college during the school day with help from guidance counselors, college admissions representatives and volunteers. In 2015, GEAR UP expanded MCAC's reach to 20 high schools across the state—a **79% increase in students served from 2014.** ■

Faculty Tackle Textbook Costs

BRISTOL CC PROF SPURS FREE RESOURCE INITIATIVE



In 2014, **Bristol Community College** Math Department Chairman **Dan Avedikian**

(pictured above) ditched his textbook in favor of free and easily accessible resources. He saved each student an estimated \$250 by creating course content in the form of lecture notes and a series of YouTube videos where he demonstrates how to solve each problem.

He wasn't alone. Using a grant from the **Vision Project Performance Incentive Fund**, Bristol launched the Open Educational Resources (OER) initiative to incentivize faculty to replace textbooks and "go for free" materials in the classroom.

"This project has widened access to quality education," affirms Avedikian. "The high price of textbooks can be a barrier for some qualified students that are already struggling to come up with the money needed for tuition and fees."

BCC began to see results after just one year. By the close of 2015, courses that utilized OERs generated a total savings of over \$33,000 for students and decreased DWFI rates (students receiving D's, W's, F's or Incompletes) by 16 percent. ■

College Readiness for All Students

BY SHEILA HARRITY



Sheila Harrity is superintendent of the Montachusett Regional Vocational Technical School District and vice chair of the Massachusetts Board of Higher Education.

TRANSFORMING EDUCATION AND THE WAY WE THINK ABOUT a meaningful high school experience has never been more important to Massachusetts educators. Engaging students, making those important connections between academic instruction and practical applications, and building relationships with community and business leaders are the top three priorities in my work everyday.

With more than 59,000 students (45% female, 55% male) currently enrolled in Career/Vocational Technical Education (CVTE) programs in Massachusetts schools, it is imperative that we work together to change the age-old perception of vocational-technical education. Long gone are the days when all voc-tech students could aspire to the middle class on blue-collar wages; today, such opportunities are much more limited. With 70 percent of Massachusetts jobs requiring some post-secondary education, our students must be prepared for college success. Recent CVTE Follow-Up Survey Results indicate Massachusetts vocational-technical students are enrolling in advanced educational programs after high school at a rate comparable to their peers graduating from traditional, comprehensive high schools. In fact, an average of 55 percent of survey respondents reported being enrolled in a college or university one year after high school graduation.

So many of today's vocational-technical programs demand at least a bachelor's degree in order to be competitive. If our goal is to effectively prepare students to enter competitive fields such as STEM, healthcare, and engineering, we must also prepare them for college success. This preparation must include embedding rigorous coursework into vocational-technical programs at every turn. For years, students in the very popular Health Occupations programs at **Montachusett Regional Vocational Technical School** (Monty Tech) have been provided with the opportunity to earn a number of industry-recognized creden-

Expanding access to early college programs, promoting dual enrollment opportunities, and developing robust articulation agreements will not only save our college-bound students time and money, these programs will reduce redundancy and keep students engaged.

tials, including: CPR, First Aid, and EKG Technician credentials, as well as Medical Assistant certification and Nurse Assistant certification. Now, however, these students are also earning eight college credits and an Emergency Medical Technical (EMT) certification, because of a newly established high school-to-college partnership. This opportunity would not be possible without the support of our community college partner, **Mount Wachusett Community College**. Similarly, our Engineering students are finding great success in the school's Project Lead The Way (PLTW) coursework. Eighty-two percent of the students who sat for final PLTW exams last year earned proficient or advanced scores, qualifying them for college credits at 63 colleges and universities across the country.

To close the skills gap, and effectively prepare every student for necessary post-secondary coursework, our college partners have a very important role. Expanding access to early college programs, promoting dual enrollment opportunities, and



Collaboration for College Success. Through a new partnership with Mount Wachusett Community College, Monty Tech's Health Occupations students have access to a dual enrollment program that offers eight college credits and an EMT certification.

developing robust articulation agreements will not only save our college-bound students time and money, but these programs will reduce redundancy and keep students engaged. We must strive to reduce barriers to college. Providing opportunities to sit for college placement exams early and often will increase the students' chances of by-passing those developmental level courses that are often the deciding factor between staying in college or dropping out. Embedding developmental level coursework into the high school curriculum will ensure our students are graduating ready to enroll in college-

level coursework. Further, piloting programs that allow students to enroll without sitting for college placement exams may result in increased student retention and higher achievement levels—a concept unimaginable under the constraints of the existing Accuplacer configuration. Preparing students for college is one thing; retaining them is yet another. It is our job to expand partnerships like the one we have with Mount Wachusett and, together, ensure our students complete the degree and certificate programs that are necessary for entry-level careers in high-skill, high-wage fields. ■



Closing Achievement & Opportunity Gaps

100 Males Pilot Programs Launch

CAMPUSES & COMMUNITIES BUILD STUDENT SUPPORT TEAMS

100 Males in Framingham

When Framingham High School sophomore **Onasis Pena** received a written invitation to join the new **100 Males to College** program for male students of color, he immediately put the letter in the recycling bin. While most educators are painfully aware of the odds facing students like Onasis, he was nonchalant. "I wasn't really interested in the letter. I wasn't going to think about it," he recalls. "I'm like a C, D student."

His mother and school counselors intervened, but Onasis' lukewarm response points to why **Framingham State University** and **MassBay Community College** joined forces with two local high schools to help seed the Department of Higher Education's 100 Males to College program in their community. The program, now operating in Framingham and Springfield with additional pilots being considered by other cities, targets male students who are at the greatest risk of never earning a college degree. The initiative leverages campus and community resources to create a "Brotherhood for Success" through a positive youth development model that embraces culture, identity and community.

At a recent program kickoff at Framingham State, Onasis had lots of company from peers who, like him, couldn't visualize college as a part of their future. Skilled facilitators encouraged the young men in roundtable discussion groups to think about their personal "brand" in comparison to established commercial brands such as Nike and Apple.

"We want them to connect their personal brand to excellence," said **Sean L. Huddleston**, chief diversity and inclusion officer for Framingham State. "We want these young men to see themselves as game changers. The very fact that these young men are enrolling in and graduating from college at much lower rates than every other population makes this a critical program for us to have."

100 Males to College provides students with "success coaches," full day and overnight visits to local campuses, a free dual enrollment course, ongoing in-school support, financial aid literacy and college and career planning seminars.

Onasis, who began his 100 Males journey with little sense of direction, is already dreaming of a college major in either engineering ("I'm pretty good at math") or culinary arts.



Bound for Greatness. A 100 Males participant in Framingham listens to a mentor at Framingham’s launch event in February 2016, and Springfield participants gear up for an overnight retreat at Westfield State University in July 2015.

100 Males in Springfield

100 Males to College students in Springfield have the option of taking their first college classes—and most will be the first in their family to do so. Of the 44 young men who enrolled in three specially designed dual enrollment courses at **Springfield Technical Community College** (STCC) last fall, 33 earned a grade of C or above, including ten who earned A’s. Five students failed their courses, and one withdrew early.

The grades don’t tell the whole story, however. **“I’m optimistic because this is their first crack at something college-level,”** says **Arlene Rodriguez**, vice president for academic affairs at STCC. “These courses are not watered down.”

“They learn how college courses differ from high school courses in regard to content, organization and student responsibilities,” notes STCC Professor **Josh Carreiro**. “In addition to teaching the course material, I also spend time helping the students acclimate to a college environment.”

And Carreiro is encouraged by a pattern developing among the young men: on their own, they’ve begun to show up on campus well before the start of class in order to hang out with him in the faculty lounge.

“By helping them succeed in the course, I believe the students—especially those on the fence about attending college—will develop a confidence that they can manage college-level work.” ■

On May 16, 2016, the Springfield 100 Males program held a ceremony recognizing its first cohort of participants:

- 119 Young Men
- 1 Sophomore
59 Juniors
59 Seniors
- 29% Participated in Dual Enrollment Courses
- **100% of Seniors Graduating High School**
- **95% of Seniors Going to College**
- **5% of Seniors Enrolling in Military**
- 324 College/University Applications Submitted



Cohort-Based Support Models Spell Success

AFFINITY GROUPS HELP CONNECT, RETAIN MALE STUDENTS



Building Community. The Ubuntu Scholars with Jeff Joseph (right), Massasoit's director of minority mentorship programs and first-year experience.

Massasoit and Quinsigamond Community Colleges and Salem State University are three of the public campuses now using support groups to help male students of color build their own communities.

At Massasoit, the new **Ubuntu** (roughly translated as "Humanity" or "Community" in Zulu) Scholars program fosters a sense of campus community through peer support and male mentorship. At a recent meeting of the group, student **Peter Louissaint** explained to visitors that hearing about the struggles of his peers had motivated him to work harder in school. His grade point average at Massasoit has shot up from a 2.1 to a 3.4.

"I've had to learn the hard way that you can't do things alone in life," Louissaint says of his Ubuntu experience. "Rather than be a lone wolf, you have to see there are other people in the room who can help you."

A community mentor, **Brockton Superior Court Judge Richard Chin**, nodded approvingly. The first in his family to go to college, Judge Chin now brings court officers to campus to meet the Ubuntu Scholars, "to see young men who are not in handcuffs."

"For years, I've been doing criminal cases, and all I see are young men killing each other. Becoming involved with this program has been rewarding and refreshing."

Quinsigamond's **Brothers and Keepers** male mentoring initiative is credited with helping to improve retention and graduation rates among male students. Of the 23

participants who attended a total of 17 programs and workshops held last year, 20 students either graduated or returned to QCC this year to continue their studies.

At Salem State, members of the **Brotherhood for Success** meet regularly to give each other academic and social support—and get free haircuts. On a semester basis, four local barbers come to campus and set up shop in a room set aside for them, effectively turning it into a functioning barbershop. Members of the Brotherhood come in not only to have their hair cut but, more importantly, to talk with the barbers, who serve as defacto mentors.

"Members are telling us that their participation in the Brotherhood is the reason they are staying at Salem State," says director of diversity and multicultural affairs **Rebecca Comage**. "They say the group gives them a sense of belonging. That sense of community and building shared experiences are among the many key factors, as we all know, that drive college retention." ■

The Salem State Brotherhood is cited as one of several reasons for improvements at SSU from fall 2011 to fall 2014:

- +20 percentage points in first-year retention rates for African American male students
- +10.4 percentage points in first-year retention rates for Latino male students

“Excellencia in Education”

FAMILY-STYLE VIBE ATTRACTS NECC STUDENTS



A Full House. Math tutor Carlos Rivera (right) is available to a room packed with students utilizing the Student Success Center services.



Northern Essex Community College’s Student Success Center (SSC) has received

national recognition for its work helping Latino/a students succeed in college. The four-year old Center, established using a Vision Project Performance Incentive Fund grant, won a 2015 *Excellencia in Education Award* for demonstrating through data and evidence that it had improved the performance of Latino/a students, one of only 20 college programs nationwide to receive such recognition.

Twenty-three percent of NECC’s 2,576 current Latino/a students have used the Success Center’s resources: tutoring, counseling, and career exploration. “It’s very family-oriented; all the ladies who work there are like your moms,” said **Carlos Rivera**, a

NECC student who received academic support at the Center and is now a math tutor himself.

“But it’s not only about tutoring,” adds Rivera. **“You tell them what you want to do and they immediately start working for you.** I told them I want to be a neurosurgeon and they took me to Dartmouth and to Harvard to see the medical schools.” ■

Latino/a students using the SSC vs. Latino/a students not using the SSC:

- 11.3% higher course completion rate
- 19% higher retention rate



Small Campus Shrinking Big Gaps

DIVERSITY DRIVE AT MCLA

The smallest of the nine state universities, **Massachusetts College of Liberal Arts** (MCLA) has used intentional recruitment strategies to boost the percentages of African American and Latino/a students at its Berkshire campus. Enrollment gaps have declined, while the graduation rate gaps are significantly smaller at MCLA than for the state university segment as a whole.

The college credits its success to partnerships with community-based organizations, outreach to diverse communities, and support of students as they transition to college life. ■



VIEWPOINT

Diversity at the Flagship Campus

BY LEYKIA BRILL



Leykia Brill is assistant provost for diversity at the University of Massachusetts Amherst.

ADMISSION TO MASSACHUSETTS' FLAGSHIP CAMPUS HAS BECOME MORE COMPETITIVE

than ever before. The average GPA for entering freshmen at UMass Amherst now stands at 3.83, a sign of the University's growing attraction for students and families and a source of great pride for alumni and other supporters. As admission standards have tightened, staff, faculty, and students from all areas of campus have voiced concerns about diversity. How does UMass Amherst compare to its peer institutions in this regard? Does the student body reflect the demographics of the state?

According to the most current US Census data, 10.8% of Massachusetts residents are Hispanic/Latino, 8.3% of Massachusetts residents are Black/African American, .5% are Native American/Alaska Native, and .1% are Hawaiian/Pacific Islander. At the University, 6% of undergraduates are Hispanic/Latino, 4% of undergraduates are Black/African American, and less than 2% are either Native American/Alaska Native or Hawaiian/Pacific Islander. At first pass, these comparisons may cause alarm: much of the frustration voiced on campus concerning "compositional diversity" has centered on these data. After digging deeper, however, it has become clear that the data are only part of the story.

In the fall of 2014, Chancellor Kumble Subbaswamy organized constituents from across campus to help create the Diversity Strategic Plan. A Steering Committee shed light on many misconceptions about the data, noting that our applications were increasing across all ethnic and socio-economic groups and that we were on par with our peer institutions in terms of numbers. Over the previous ten years, our applications had grown by 184%, from 20,207 in 2005 to 37,183 in 2014.

"During this period, while total applications grew by 184%, applications from Latino, African American Indian/Alaska Native and Native Hawaiian/Pacific Islander students grew by a remarkable 335%," the authors of the Diversity Strategic Plan wrote. Additionally, in a chart comparing UMass Amherst to our peer institutions, the data indicated that "...nearly all public universities have representations (of students of color) below that of their states—in many cases, substantially below. In fact, only three of these institutions have enrollments that equal or exceed those of their states, and all three are schools in states with very low (underrepresented) populations and that enroll a large number of out-of-state students."

The Diversity Strategic Plan acknowledged that while the University's rapid growth was good news, it could not abandon additional efforts to both expand the recruitment and to yield (convert to deposits) the students of color we were attracting. And so, we've begun shifting our focus and emphasizing the use of a holistic review process to consider our applicants. By broadening the scope of attributes used in making a decision about an applicants' candidacy, we empower our applicants and our team of admissions counselors. Applicants are no longer reduced to a test score or a grade point average. Admissions counselors become agents of advocacy with an expertise that goes beyond number-crunching. By applying a qualitative method to each application we review, we are diversifying our campus community in measures beyond the merely compositional.

What qualitative methods add to a review process is the opportunity for the applicant to tell us exactly why we should believe in them, their story, and their potential. We know that for the entering class of fall 2015, 20% came from low-income (Pell-eligible) homes, and that 24%



Diversity is about much more than race or ethnicity for UMass Amherst. Diversity is about the opportunity to be in a classroom, a dining hall, a residence hall, or a playing field that brings with it people from various geographical locations, religious affiliations, political parties, socio-economic statuses, and gender (non)identities.

were the first in their families to go to or graduate from college. These students are no less attractive to us because they come from fewer resources. In fact, we want students who have demonstrated an ability to navigate communities, schools, and situations that are far from perfect because we know these students to be resilient. They can handle the stressors of academic life while simultaneously juggling responsibilities at home and in the world—skills essential to success in college and beyond.

One of the biggest criticisms any institution faces when employing a holistic application review process is the idea that it will unequivocally lead to the “watering down” of the admitted

student pool. The assumption is that we’d have to lower our grade point averages and standardized testing credentials to admit more students of color. These accusations are far from true, as demonstrated by our ever-rising average GPA for admitted students. Moreover, we have made strides in the composition of our classes. In the 2016 admissions cycle, over 10% of the students admitted to the Commonwealth Honors College (CHC) are underrepresented minorities, up from 8% on the 2015 cycle. First generation to college students were also up from 13% of the CHC admits to 15%. In numbers, this means we admitted just under 200 more students from underrepresented and first generation to college backgrounds this year than last—all made possible by the use of qualitative methods, or the holistic review process.

Why is any of this important? Beyond the fact that students across our nation are crying out to see themselves reflected in both the student and faculty bodies of their institutions of higher education, colleges and universities have a civic duty to educate global citizens. The value of learning in a diverse community links directly to this obligation and, in fact, benefits all students. Diversity is about much more than race or ethnicity for UMass Amherst. Diversity is about the opportunity to be in a classroom, a dining hall, a residence hall, or a playing field that brings with it people from various geographical locations, religious affiliations, political parties, socio-economic statuses, and gender (non)identities. For us, pursuit of a diverse community implores us to provide our students with a chance to open their minds to a world of difference. ■



Raising College Completion Rates

Blazing New Transfer Pathways, Discipline by Discipline

UMASS, STATE U, COMMUNITY COLLEGE FACULTY ENGAGED



In a highly decentralized system of public higher education like the one in Massachusetts, it's rare to find biology or political science professors from UMass, state universities, and community colleges gathering for any reason—let alone to assess curricula or weigh which courses are comparable enough to transfer. Yet this is exactly what happened when educators sat down in a series of cross-sector meetings, discipline by discipline, bargaining and cajoling their way to agreement on a new, seamless system of transfer pathways set to debut in fall 2016.

"These conversations only worked because we got faculty together from across the system, people who had never talked to each other before," said [Commissioner Santiago](#) recalls, adding with a chuckle, "We locked the doors and said, 'No one's leaving until we get this done.'"

And they did it: Supported by the Vision Project Performance Incentive Fund, faculty from six different disciplines developed new 60-credit course maps called MassTransfer Pathways that lay out the first two years of a four-year baccalaureate degree, making it possible for

students to transfer to a state university or UMass campus without losing any credits or having to take extra classes. Ten more disciplines have been agreed to, and their maps are in the final stages of development. In order to forge the agreements, some campuses needed to alter the content of classes to align with other institutions.

"It was, frankly, invigorating to meet with my history colleagues from around the state," said [Chris Laney, Berkshire Community College](#) professor and MassTransfer segmental leader for history. "The meetings were genial and productive, and I believe the results will greatly improve the transfer process for students."

Students will be able to view the pathways on an interactive website being developed by the Department of Higher Education. The online system will show students a course map for their first four semesters, including general education, major and elective classes. The transfer pathways are the foundation of the new Commonwealth Commitment to Access, Affordability and Completion program recently signed by the presidents of all public colleges and universities (see page 23). ■



The new MassTransfer Pathways:

- Biology*
- Business+
- Chemistry*
- Communications & Media Studies+
- Computer Science+
- Criminal Justice+
- Early Childhood Education+
- Economics*
- English+
- History*
- Liberal Arts+
- Mathematics+
- Political Science*
- Psychology*
- Sociology+
- STEM Natural/Physical Sciences+

* Effective fall 2016

+ Effective fall 2017



Groundbreaking Discussions. At a meeting convened by the DHE at Fitchburg State in May 2016, math faculty from across the system gathered for an unprecedented, day-long discussion. By the end of the meeting, faculty had defined a common set of “foundational courses” that a transfer student can complete at any campus to fulfill the freshman and sophomore requirements of a bachelor’s degree in mathematics.



Breaking Remedial Math Barriers

NEW THINKING ON DEVELOPMENTAL MATH NEEDS



Continuity is Key. In 2009, Fitchburg State University began requiring that students enroll in college-level math in their freshman year rather than delaying it, leading to a 22 percentage point increase in gateway math completion rates. The Vision Project Performance Incentive Fund (VP-PIF) has been supporting the sharing of such proven practices between campuses.



In 2016 the Board of Higher Education extended a systemwide pilot that seeks to overhaul developmental math barriers to college completion. Twenty campuses now use high school GPA instead of or in addition to Accuplacer testing to assess whether students are ready for college-level math. Preliminary results at community colleges and UMass campuses show that, between students who were placed in college-level math by Accuplacer versus GPA, course completion rates were nearly equivalent. At the state universities, students who were placed according to high school GPA fared better: 91 percent completed a college-level math course, compared to 84 percent of students placed by Accuplacer results.

For those students who place into developmental math, two of the most successful approaches being utilized by campuses—here in Massachusetts, and nationwide—are the so-called corequisite remediation model and the creation of alternative math pathways that align with students' majors. Students enroll directly into college-level courses and receive academic support alongside their regular classes. **A spring 2016 report by Complete College America found the corequisite model, when combined with the use of new pathways, is doubling and tripling gateway college course success rates in half the time or better.**

Here in Massachusetts, **Westfield State University** has been a leader in using the corequisite approach since 2005. Students are assigned to 100-level math classes based on their major; Westfield added a supplemental instruction program for students who failed the Accuplacer test, and requires those students to meet an extra hour per week in extended time sections. Today, there are no stand-alone prerequisite developmental classes offered at Westfield State.

The changes are yielding promising results. A study conducted last year for students who failed the Accuplacer test and enrolled in Mathematics for Business and Social Sciences found that only six percent of those in extended time sections had withdrawn and only three percent had failed, compared to 33 and 11 percent of students placed into regular classes without extended time support.

Other Campus Results with New Approaches to Developmental Math:

- In 2014, **Bristol Community College** began placing all students with a 2.7 or higher high school GPA directly into college-level courses. An additional 114 students were able to take credit-bearing courses under the new placement method; 87 percent of students passed the class compared to the 58 percent of students who passed the class under the old Accuplacer placement method.
- At **Bunker Hill Community College**, nearly 50 math faculty members have worked together to successfully compress developmental courses into fewer semesters and link developmental and college-level courses in new Accelerated Pathways. The pathways shortened the number of developmental education courses from three to two for the nearly 90 percent of students who are non-STEM majors. After the new pathways were implemented, successful course completion in developmental math rose from 57 percent in fall 2012 to 66 percent in fall 2014.
- **Fitchburg State University** has implemented a series of changes, beginning with a 2009 requirement that all freshman enroll in a college-level mathematics course during their first year. Since the policy took effect in 2009, the number of students completing a first-year gateway math course has climbed from 35 to 57 percent, a 22 percentage point increase. Additionally, FSU has aligned students' gateway math courses with their majors, and launched an extensive restructuring of developmental math.

These efforts were complemented last fall with the offering of a co-requisite program in Applied Statistics, one of the most popular college-level mathematics classes offered on campus. Students meet for supplemental instruction one additional hour per week to review course content and receive tutoring. Initial data show a 12.4 percent increase in the number of students passing the college-level math course. ■



Preemptive Move. Mount Wachusett Community College has brought developmental education into its feeder high schools to address remedial needs before students even enter college.

An Early Start on Math Remediation

MWCC IN LOCAL HIGH SCHOOLS

Mount Wachusett Community College's Math Modeling program helps students avoid the financial and psychological toll of having to take noncredit developmental classes in college. Instead, The Mount brings remediation directly to seniors at its feeder high schools. Since it began in 2013 with 105 students, the program has nearly quadrupled in size and continues to expand.

College faculty and local school math teachers collaborated jointly in developing MWCC's four-credit Foundations of Mathematics course curriculum. From its beginnings at Leominster High School and the Leominster Center for Technical Education Innovation, the program has grown to include five additional high schools in North Central Massachusetts. This academic year 388 students participated; two additional high schools will join during the 2016-17 academic year. ■

MWCC's Foundations in Mathematics Outcomes:

- 70% of students complete the course with a grade of C or better and are ready for college-level math.
- MWCC developmental math enrollment rate dropped from 27% in fall 2013 to 16% in fall 2015.



VIEWPOINT

The Associate Degree: Revalued

BY NOEMI CUSTODIA-LORA, LANE A. GLENN & DAVID R. LEGG



Noemi Custodia-Lora is assistant dean of liberal arts and sciences at Northern Essex Community College.



Lane A. Glenn is president of Northern Essex Community College.



David R. Legg is vice president of quality assurance at Charm Sciences.

JUST BECAUSE EMPLOYERS CAN require a bachelor's degree or higher for a particular job does not mean they have to. **Northern Essex Community College's** partnership with **Charm Sciences**—a Lawrence, Mass. company that develops and manufactures biochemical diagnostic test kits for the food and beverage industries—offers a perfect example of what can happen when an employer is able to hire an associate degree-holder for a job that may previously have required a bachelor's degree.

Around 2007, the company was assessing its entry-level lab analyst positions, which, up until then, had required a bachelor's degree. To meet growing hiring needs, Charm Sciences decided to split the duties of some of its lab analysts and create a new category called "lab technician"—which would require an associate degree.

To help Charm Sciences and other life science companies fill such positions, science faculty at Northern Essex developed a new Laboratory Science Program (LSP), a hands-on program which included an internship. The program launched in 2009, and its close alignment with industry needs was quickly recognized: In December 2010, the LSP received "Gold Endorsement" by the **Massachusetts Life Science Education Consortium**. The employer-driven consortium awards gold only to programs whose curriculum includes all competencies as mandated by the industry members.

This model has worked well for Charm Sciences, which places students in externships and has hired three graduates for permanent jobs. Currently, ten of its approximately 40 entry-level laboratory positions are open to associate degree graduates as quality control, quality assurance, and production technicians.

More recently, Northern Essex was contacted by one of its alums, **Terry Stubbs**, the president and CEO of **ActivMed Practices and Research, Inc.** This fast-growing medical-clinical research company has successfully completed nearly 650 research trials. Rapidly evolving regulations and technology, however, are swiftly changing the job requirements for trial technicians.

Although physicians, nurses, and scientists—all with advanced degrees, steep salaries, and often short tenures in entry-level positions—are involved at every stage of their work, daily protocols can be managed by an emerging new role: the associate degree level clinical research coordinator (CRC).

The challenge? Right now, these coordinators don't exist—and neither do degree programs to train them.

So NECC is working with ActivMed, the **Alliance for Clinical Research and Safety** (ACRES) and other local employers to develop the first certificate in the Northeast dedicated to training clinical research coordinators as part of our Associate in Science General Studies Health Specialization degree program.

While Charm Sciences and ActivMed have discovered the benefits of hiring associate degree graduates, many companies continue to seek bachelor's degree graduates for nearly all of their positions. By restoring the associate degree's value, we can begin to address the skills gap and build a stronger, more efficient and effective ladder of educational and career opportunity across New England. ■

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A Singular Achievement. MCLA is the only public four-year college in New England to outperform peer institutions in attracting and graduating Pell Grant recipients. Forty-five percent of MCLA's student body is Pell-eligible, and those students' graduation rates are only slightly lower than the overall graduation rate.

National Recognition for Low-Income Grad Rates

MCLA WINS US DOE PLAUDITS

Massachusetts College of Liberal Arts (MCLA) has earned the distinction of being the only public four-year college in New England to “outperform (its) peer institutions in enrolling and graduating Pell Grant recipients,” according to the U.S. Department of Education.

For the first time this year, the Department is scoring colleges on the number of low-income students they enroll and the number they see through to graduation day, amid rising concerns that too many of these students never earn college credentials. Forty-five percent of MCLA's students are Pell-eligible, which means their families earn less than \$40,000 a year. Typically, colleges and universities report a substantial gap between the number of low-income students who enroll and the number who actually graduate, but at MCLA the six-year graduation rate for Pell-eligible students is only four points below the rate for all students.

“It's quite remarkable that a small liberal arts college in the Berkshires has succeeded in achieving what so many other colleges and universities are attempting to do, which is to give low-income students access to earning a college degree,” said **MCLA President James F. Birge**. “While our professors provide vital academic support and encouragement, our admissions and financial aid employees dedicate themselves to ensuring that our students—some of whom may not otherwise have had an opportunity to attend an institution of higher education—maintain the means to persist and earn their bachelor's degree. I'm very proud of the results we're seeing; it's an honor to be recognized by the U.S. Department of Higher Education for our work.” ■

Success Coaches for At-Risk Students

WORCESTER STATE PILOT SHOWS PROMISE



Worcester State University is the first public institution in Massachusetts to recruit faculty and staff “success coaches” to improve student retention. Twenty-nine faculty and staff from across campus divisions, bargaining units, and job classifications were chosen to communicate with students who showed two or three indicators of non-cognitive retention risk under Worcester's predictive model.

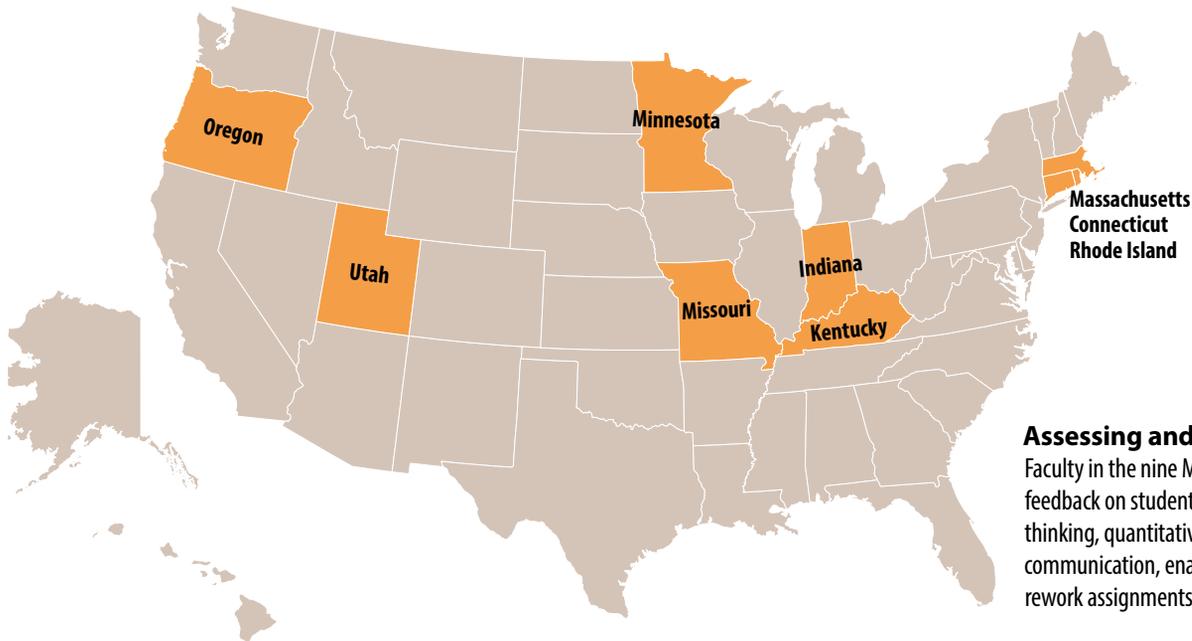
Success coaches offer early semester check-ins with students. They review the results of the student's non-cognitive risk survey results, go over any “early alert” flags on academic performance, make referrals to support offices, and assist students in building connections with Worcester State.

Preliminary results from the first semester show that of 137 students assigned a coach, 116 persisted to the spring semester.

“This modest success, combined with students' extremely positive comments about their coaches and an institutional commitment to addressing students' non-cognitive risk factors, will ensure that this pilot continues at Worcester State,” said **Ryan Forsythe**, vice president for enrollment management at Worcester State. “Scaling this will be a challenge that we look forward to addressing!” ■



Multi-State Collaborative to Advance Learning Outcomes Assessment



Assessing and Improving Learning.

Faculty in the nine MSC states are receiving detailed feedback on student learning outcomes in critical thinking, quantitative reasoning, and written communication, enabling them to identify and rework assignments that are not proving effective.

Building on work that first began in Massachusetts as part of the Vision Project, nine states have reported success in developing a shared, statistically valid assessment model that can be used to highlight and compare what college students actually learn.

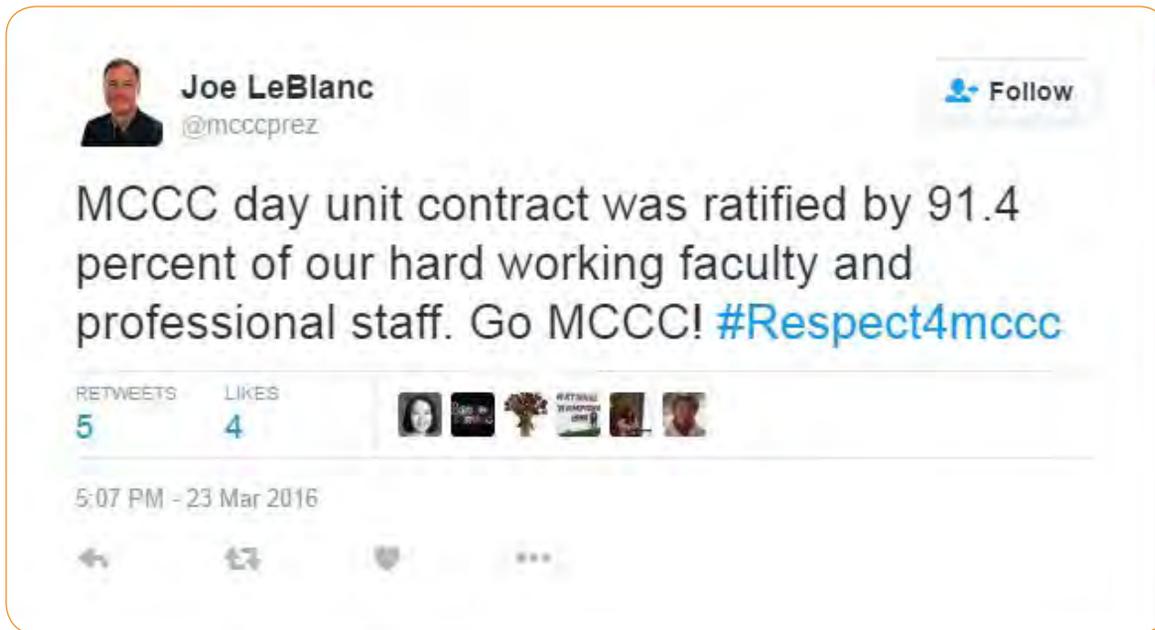
In 2015, the **Multi-State Collaborative to Advance Learning Outcomes Assessment** (MSC) invited faculty from 59 two-year and four-year institutions in Massachusetts, Connecticut, Indiana, Kentucky, Minnesota, Missouri, Oregon, Rhode Island, and Utah to score more than 7,000 samples of authentic student work. They used a new web-based platform that allowed them to upload and assess each assignment using the **Association of American Colleges and Universities'** VALUE (Valid Assessment of Learning in Undergraduate Education) rubrics to measure quantitative reasoning, critical thinking, and written communications. The goal of the pilot was to see whether the VALUE rubrics could provide an adequate measure of student learning across institutions and state lines.

Getting faculty to participate in such an assessment project was considered a breakthrough of sorts, given longstanding resistance to standardized testing at the post-secondary level. Without a new assessment model, proponents argued,

campuses might eventually face state-imposed, high-stakes exit exams, a by-product of rising concern about the value of higher education.

The Chronicle of Higher Education reported that, across the nine states, scores for critical thinking were lower than those for quantitative reasoning and written communication. Scores for written communication and quantitative reasoning showed students struggling with use of sources and evidence, and having difficulty analyzing data. The results of the pilot gave faculty detailed feedback that could be used to reshape both instruction and assignments.

Christopher K. Cratsley, director of assessment at **Fitchburg State University**, told *The Chronicle* that FSU's own assessment efforts utilizing the VALUE rubrics revealed opportunities to improve assignments designed to assess quantitative reasoning. **"We've seen that some assignments are sometimes not as good at soliciting these skills as other assignments,"** he observed. "That helps us think about how we create a balance in the instruction we give." ■



Another Step Forward. Joe LeBlanc, president of the MCCC union and faculty member at Northern Essex Community College, tweets about the ratified contract that, for the first time, includes provisions for learning outcomes assessment.

Faculty Embrace Assessment in Contract Negotiations

Massachusetts' work to create a systematic approach to the assessment of student learning stands in contrast to past experience of other states, where high-stakes exit exams have been imposed by legislatures or governors anxious to quantify the "return" on investments in higher education.

Through the Vision Project and the Multi-State Collaborative it spawned, faculty across all three segments of the Massachusetts system—and nationally, across nine states—have been full participants in efforts to create a new approach to assessment, one that would not only track outcomes to measure ROI but also provide detailed feedback to improve instruction.

In recognition of faculty's signature role in assessment, the **Massachusetts Community College Council** (MCCC) recently agreed to new contract provisions that, for the first time, recognize the importance of assessment while acknowledging both the inherent risks and additional responsibilities it will require of faculty. The contract, overwhelmingly ratified in March 2016, stipulates that faculty must include a list of student learning outcomes as a part of the syllabus for every course they teach. It also makes clear that they will not be evaluated on the basis of students' learning outcomes and affirms that "the development, implementation, and assessment of Student Learning Outcomes (SLOs) require the systematic involvement of faculty and appropriate unit professional staff."

"Our Massachusetts community college faculty have been national leaders in developing tools to assess student learning in the classroom," said Lane Glenn, president of **Northern Essex Community College** and a participant in the negotiations. "We've found that learning outcomes assessment tools lead to improved teaching and learning and also are a very effective way to demonstrate college accountability to accrediting agencies, legislators and the public. Every college will help support faculty in this essential work." ■



Spotlight on Students

The DHE’s annual **29 Who Shine** awards call attention to the pivotal role that higher education plays in producing a well-educated citizenry and workforce for the Commonwealth. Each year, the Governor recognizes 29 outstanding graduates, one from each public campus, who have demonstrated a commitment to serving others.

Among the 2016 honorees:



Sondos Alnamos from **Bunker Hill Community College** grew up near Damascus, Syria. She was visiting the U.S. when war broke out in her homeland, claiming the lives of many loved ones and changing her choice of a career. Sondos earned a BHCC degree in biomedical engineering with the goal of one day designing artificial organs and limbs for victims of conflict.



Travon Godette served as a Training Active Bystanders (TAB) Delegate and chair of the Cross-Cultural Symposium at **Westfield State University**. An NCAA national track champion, he passes along his love of sports by volunteering with the **Westfield Boys and Girls Club** and the **Special Olympics**.



As student member on the University of Massachusetts Board of Trustees, **UMass Dartmouth’s Jacob Miller** initiated the first Student Trustee Advocacy Program, bringing together student leaders to meet with state legislators and advocate for higher education funding. While serving as a legislative intern for Senator Mark Montigny, Jacob worked on health care legislation that made it easier for students to remain with less expensive plans under the state’s **Health Connector**. The legislation saves students an average of \$2,000 per year. ■

Gaining Empathy and Perspective Through Service Learning

Massachusetts Maritime Academy’s emergency management (EM) program has built civic learning and public service into a program that is designed to teach students how to prepare for, respond to, and recover from disasters.

“It’s important for students within the (Emergency Management) major to get a feel for the community they are going to deal with and gain a sense of empathy and a sense of perspective,” says **Tom Lennon**, EM program chair. “So we build the program around that mindset.”

It starts with the freshman year experiential learning partnership with **Habitat for Humanity**, includes at least one public service co-op, and ends with designing and running real emergency response exercises through the EM Capstone Project. Through these programs, EM students work with organizations locally and all over the world to learn about different cultures and communities.

For the last six years, the EM program has coordinated a co-op in **Île-à-Vache, Haiti** (pictured above) in partnership with the **U.S. Embassy** and various Haiti-based NGOs. Among many projects, students have worked with local government to develop portable water solutions for the island, and coordinated a shipment of 15,000 adult diapers for an orphanage with severely handicapped children.

Locally, the EM program works with the **Barnstable County Regional Emergency Management Planning Committee** to identify vulnerabilities within communities in Southeastern Massachusetts, and to then develop a structured EM exercise to test local, state and federal resources ability to respond to the event. ■

Statewide Civic Learning Policy

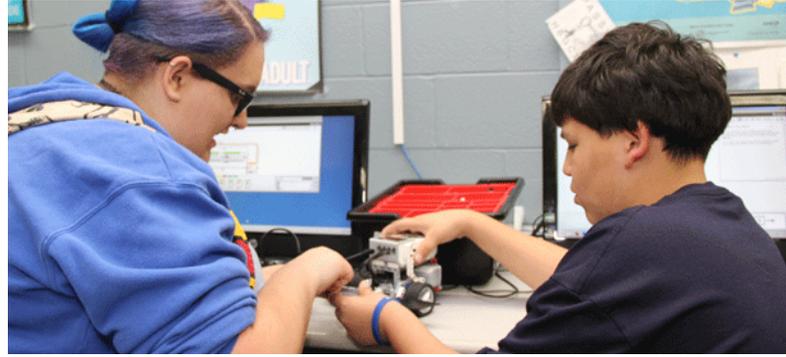
When the Massachusetts Board of Higher Education announced the Vision Project in 2010, it aimed for the state's public colleges and universities "to produce the best-educated citizenry and workforce in the nation." Faculty and administrators pointed out that the goals focused more on education for careers than on education for citizenship. The Board agreed, and in 2014, the Board's new *Policy on Civic Learning* provided a concrete definition of Civic Learning. Public campuses were called upon to make civic learning an "expected outcome" for all undergraduates, the first system of public higher education in the nation to take such an action.

Effective civic learning is more than just an "add-on" to the Big Three Degree Plan outlined in these pages. As students participate in civic learning—and especially in civic engagement beyond the classroom, or service learning—the knowledge and skills they develop can transfer to their work throughout the curriculum, and the experiences they undergo often increase their commitment to continue to graduation.

Many campuses have been doing this work for years with many of their students. At **Holyoke Community College**, for example, for each of the last 20 semesters three faculty members have designed and then taught new service learning courses: culinary arts students prepare meals for community events, nutrition students work with a food pantry, and engineering students teach young people in an after-school program how to build robots. **Lisa Mahon**, professor of English and service learning faculty coordinator at Holyoke, says: "**Many of the community-based learning projects help students gain awareness of community issues they might otherwise not know about** and help them think more critically about the role they play in the community around them."

Students in service learning courses...

- At **Mount Wachusett** and **Bristol Community Colleges** between 2011 and 2016 showed a semester-to-semester retention rate more than 20% higher than students not in those courses.
- At **North Shore Community College**, among a degree-seeking cohort from 2011, had a graduation rate in 2012–2014 that was double (34% vs. 17%) that for students not participating.



Service Improves Learning. Holyoke Community College has been a longtime proponent of weaving service learning into academic programs, such as its engineering course that includes teaching robotics to children in an after-school program.

Together, the campuses and the DHE are advancing the civic learning agenda in the following ways:

- To gain a wider sense of the effects that civic learning has on overall student success outcomes, this spring the community colleges and state universities are identifying courses that have a substantial focus on civic learning—on the knowledge, intellectual skills, and applied competencies or practical skills that students need to be informed and effective participants in civic and democratic life, and on the social and political values that underlie democratic structures and practices. The goal is for campuses to be able to include outcomes related to these designated courses in the data they report to the DHE after the 2016–2017 academic year. (Note: The **University of Massachusetts**, which continues to enjoy the Carnegie designation for community engagement, is not participating in this process.)
- The DHE is also working with national assessment experts and civic learning experts to build three tools that campuses and individual faculty can use to assess the levels of civic learning that their students can demonstrate through their work: one for Civic Knowledge, one for Civic Skills, and one for Civic Values. Each big concept is broken into a half dozen criteria, and each criterion has descriptions for student performance at four levels from introductory to capstone.
- A "Pathways to Civic Engagement" conference for faculty and staff is planned for later this month, co-sponsored by DHE and **Salem State University**. Meanwhile, the Boards of Higher Education and Elementary & Secondary Education are developing a shared framework for civic learning to prepare K–16 students to be informed and effective participants in civic and democratic life. ■



UMass Increases Patents, Licensing Income



The **University of Massachusetts** system was awarded a record 65 U.S. patents in FY2015 and earned \$34 million in licensing income. This is an increase of \$3 million from FY2014, when the most recent rankings for highest income derived from academic research put UMass 14th nationally and 6th among all public universities.

The patents granted in FY2015 came from research in a diverse field of academic disciplines ranging from the life sciences to agriculture to plastics engineering.

“The quest to create and transmit knowledge is at the core of our mission as a research university—and research and innovation also plays a critical role for our state and will determine our fortunes as we compete in the global economy,” said President Marty Meehan.

Campus Research Highlights

UMass Amherst engineering professor Aura Ganz has designed an electronic indoor navigation system, or “seeing-eye directory,” for the blind and visually impaired called PERCEPT that employs a smartphone app to detect NFC (near-field communication) tagged landmarks. The project was funded in part by the **Massachusetts Bay Transit Authority** (MBTA) and piloted at Arlington Station in Boston in 2015.

Analysis of “wet” materials like biological tissues is often chemically messy. Robyn Hannigan, dean of the School for the Environment at **UMass Boston**, is commercializing a transfer device she developed that allows for cryogenic (extreme cold) sampling of materials by laser ablation and delivery of these cold particles to a mass analyzer, allowing for accurate measurements in samples that formerly required time and the consumption of chemicals to prepare.

UMass Dartmouth biochemistry professor Catherine Neto’s latest research has found that feeding cranberry extracts to mice with colon cancer resulted in diminished size and number of tumors. As part of the UMass President’s Science and Technology Initiative grant, UMass Dartmouth established the **Cranberry Health Research Center**, where Dr. Neto (pictured above) is working to isolate individual components of the cranberry that are responsible for its anti-cancer properties.

“As the only Massachusetts research campus south of Boston, UMass Dartmouth plays a critical role in attracting, developing and retaining innovation economy talent for the region,” said Anthony R. Sapienza, president of New Bedford’s **Joseph Abboud Apparel Corp.**

“College of Engineering students and faculty work with us to improve our manufacturing processes.”

UMass Lowell computer science professor Holly Yanco is developing a better way for first responders to communicate with each other and work with robots in the field. Robots create a 3-D map as they move through the site, able to go into disaster zones that are too dangerous for humans. First responders and the robots will be fitted with Google Glass, so information is quickly and easily shared on the ground without the need for a command center or “middle man.”

Two groups of researchers at **UMass Medical School** have identified genes that disable HIV-1, suggesting a promising new strategy for fighting the virus that causes AIDS. New drugs developed by the scientists are shown to reduce the infectivity of HIV-1 virions by more than 100 percent. ■

Changing Landscape for Research

BY MARTY MEEHAN



Marty Meehan is president of the University of Massachusetts.

U MASS HAS A THREE-FOLD MISSION OF EDUCATION, RESEARCH AND PUBLIC SERVICE, and the manner in which it has been able to advance that mission should be a source of great pride for the citizens of the Commonwealth.

The research taking place on each of our campuses has the potential to cure disease and cleanse the environment. It provides an exciting learning environment for today's students and tomorrow's scientific stars. Research fuels the innovation economy, and in so doing creates the economic environment that keeps bright minds in the Commonwealth and attracts others to come. It is why UMass ranked 57th in *Thomson Reuters* inaugural rating of "The World's Most Innovative Universities."

With our five campuses spread throughout the state, UMass research sparks innovation and economic development in and around our campuses in Amherst, Boston, Dartmouth, Lowell and Worcester. Each campus has research specialties that enhance and benefit the region and position the Commonwealth for future success.

Like many research universities—public and private—UMass has been forced to confront a challenging environment in recent years caused by the federal government's decision to pull back on funding for university research since the recession of 2008 wreaked havoc on public-sector budgets at all levels.

Concerns about the outlook at the federal level prompted UMass to energetically look to other partners for the funding needed to fuel its burgeoning research enterprise. The good news is that state government and local industry—both recognizing the quality of UMass R&D and its economic-development importance—have stepped in to pick up the slack.

In its recent report, UMass documented a \$26 million research-expenditure increase, with spending rising from \$603 million in FY2014 to \$629 million in FY2015. Of particular note is the **UMass Medical School's** contribution of over \$250 million.

Most of the \$26 million increase—\$19 million—was funded by grants we received from the **Massachusetts Life Sciences Center**, the bulk of which was earmarked for the Institute of Applied Life Sciences at the **University of Massachusetts Amherst**.

We received an additional \$6.5 million from industry partners, including \$3 million from **Raytheon** for the **University of Massachusetts Lowell** to create a research institute that will connect the next generation of innovators with established aerospace and defense experts.

This diversified funding base has served us well during these recent years and will hold us in good stead in the years ahead, particularly if research re-emerges as a priority at the federal level.

In pointing to the importance of seeking out—and finding—other funding partners, I do not mean to undermine the significance of federal research funding, as federal agencies continue to provide a significant portion of the funding for UMass research. And, there is ample reason to believe that the clouds may be parting and the long-term forecast may be getting much better given Congress's recent decision to increase funding for the **National Institutes for Health** by a sizable \$2 billion, the largest increase in more than a decade.

My hope is that this action launches us into a new era of bipartisan support for research at the federal level and that research universities across the nation will receive the funding they need to conduct the work that saves and improves lives and fuels the economy at the local, state and national level.

Investing in the creation of knowledge truly is the investment that always pays dividends. As president, I am more than proud when I see the research portfolios that have developed on each of our campuses and look at the far-reaching impact that UMass research has now and will have in the future. ■

PHOTO CREDITS

All headshots courtesy of their subjects.

Cover photo: David Fried, Westfield State University

Page 2: (center) Kevin Harkins Photography / Middlesex Community College

Page 5: (top) Michelle Woodward, Department of Higher Education;
(bottom) Janice O'Connor, Mount Wachusett Community College

Page 9: (top) KulbakoPhoto.com / Massachusetts College of Art & Design;
(bottom) North Shore Community College

Page 12 & 14: UMass Amherst

Page 13: (top) UMass Boston; (bottom) Salem State University

Page 16: Tory Germann Photography / UMass Lowell

Page 22: MetroWest College Planning Center

Page 23: Middlesex Community College

Page 24: Holyoke Community College

Page 25: Massachusetts Maritime Academy

Page 26: (top) Quinsigamond Community College;
(bottom) Greenfield Community College

Page 28: Center for Corporate and Professional Education, Cape Cod Community College

Page 29: (left) GEAR UP Massachusetts, Department of Higher Education;
(right) Bristol Community College

Page 31: Janice O'Connor, Mount Wachusett Community College

Page 33: (both) Michelle Woodward, Department of Higher Education

Page 34: Massasoit Community College

Page 35: (left) Mike Dean Photos / Northern Essex Community College;
(right) Massachusetts College of Liberal Arts

Page 37: UMass Amherst

Page 39: (all) Matt Bruun, Fitchburg State University

Page 40: Fitchburg State University

Page 41: Mount Wachusett Community College

Page 43: (left) Massachusetts College of Liberal Arts;
(right) Worcester State University

Page 46: (three at left) KulbakoPhoto.com / Department of Higher Education;
(right) Massachusetts Maritime Academy

Page 47: Holyoke Community College

Page 48: UMass Dartmouth

DATA

Dashboards

How does the Massachusetts system of public higher education compare against other state systems in the U.S.? This section presents the data used to track progress in the key outcome areas of the Vision Project. In line with the goal of national leadership, Massachusetts' standing is compared to leading states and the national average where available. The data is presented in a series of dashboards; trend data is incorporated where available to show whether Massachusetts is improving in performance, remaining flat, or worsening in performance on key metrics.

How to Read the Dashboards

Bar Graphs. Where available, national comparisons are displayed along with Massachusetts' performance in the central bar graphs.

▲ = Leading State(s) ■ = Massachusetts ▼ = National Average

MA Trend Data. Where available, analysis of trend data on Massachusetts' performance, comparing three-year rolling averages, is displayed to the right of the bar graphs.

✔ = Improving Performance ☹ = Flat Performance ✘ = Worsening Performance

Comparison Groups. Pages 60–61 present all available data on achievement rates and gaps between Massachusetts' African American and Latino/a students and White students.

■ = African American or Latino/a ■ = White — = Size of Gap

Data Source Acronyms. A glossary of these acronyms is on page 63.

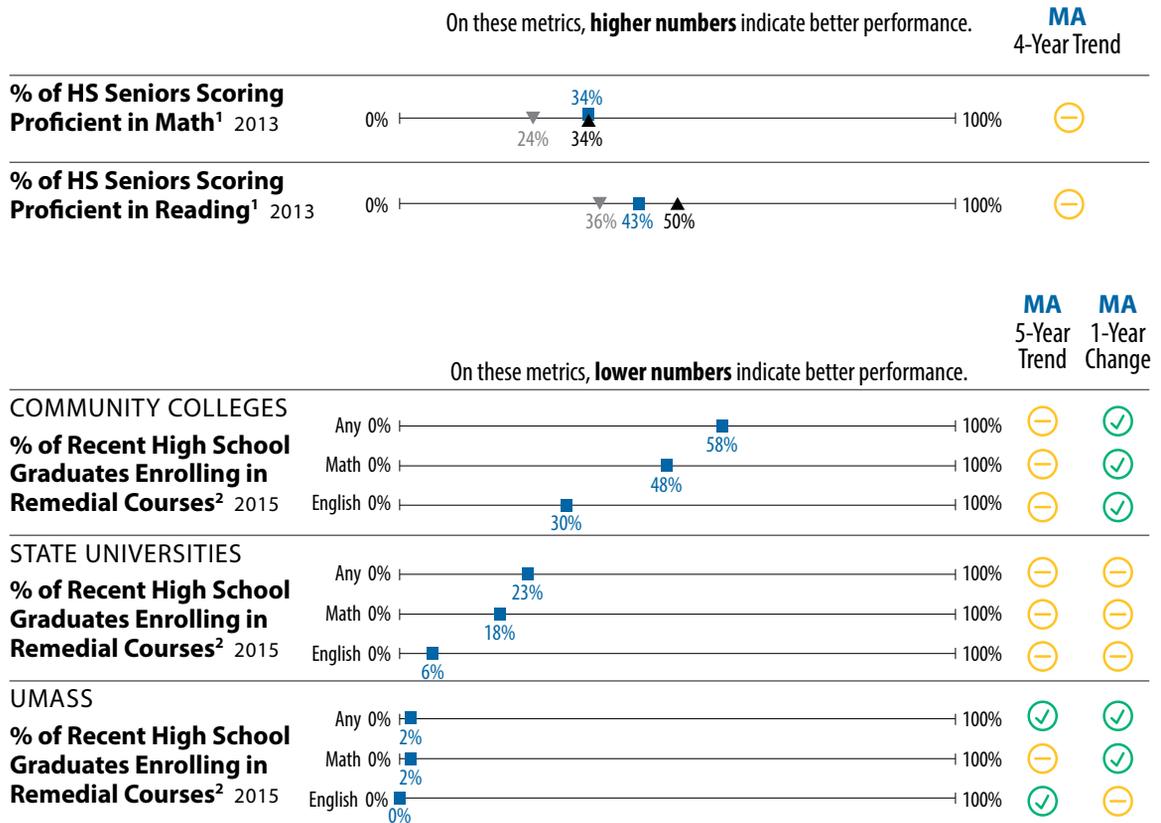
Other resources, including supplemental metrics, index of leading states, and technical appendix are available at www.mass.edu/vpreport



College Participation

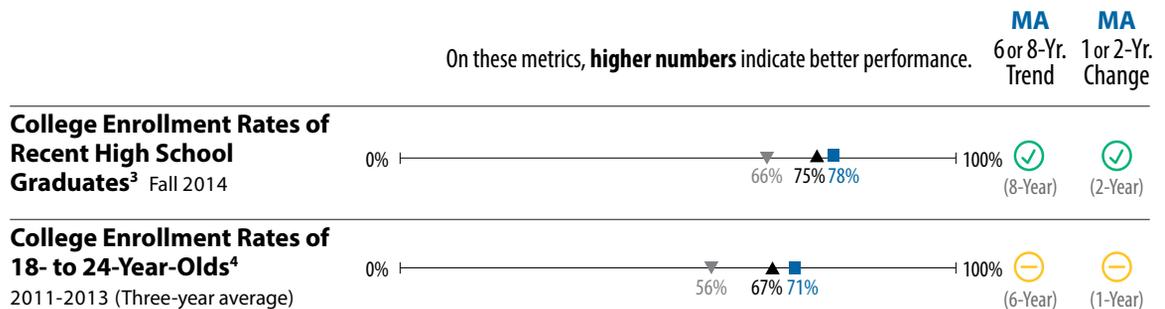
College Readiness Rates

With national comparisons and trends where available



College Enrollment Rates

With national comparisons and trends where available



Bar Graphs ▲ = Leading State(s) ■ = Massachusetts ▼ = National Average

MA Trend Data ✓ = Improving Performance ⊖ = Flat Performance ⊗ = Worsening Performance



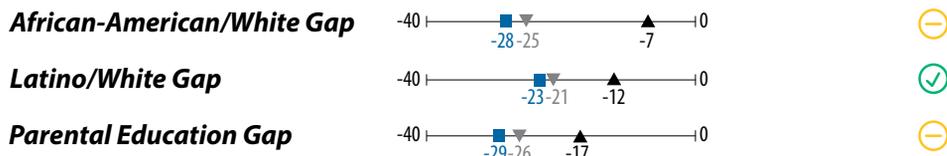
Gaps in College Readiness Rates (in percentage points)

With national comparisons

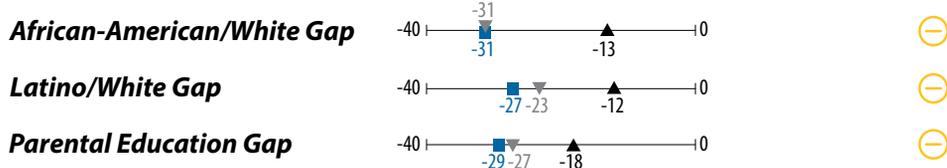
On these metrics, **lower numbers** indicate better performance.

MA
4-Year Trend

% of HS Seniors Scoring Proficient in Math¹ 2013



% of HS Seniors Scoring Proficient in Reading¹ 2013



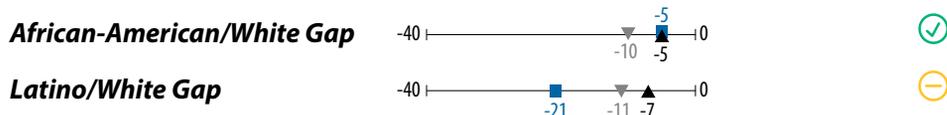
Gaps in College Enrollment Rates (in percentage points)

With national comparisons

On these metrics, **smaller numbers** indicate better performance.

MA
5-Year Trend

College Enrollment Rates of 18- to 24-Year Olds⁴ 2011–13



Cohorts and Sources • ¹ Cohort: Public high school seniors scoring proficient or higher in 2013. Source: 12th Grade National Assessment of Education Progress (NAEP), USDOE/NCES • ² Cohort: First-time, full-time, degree-seeking students who are recent Massachusetts public high school graduates and who enrolled in fall 2015. Trend data spans 2010–2015. Source: MDHE • ³ Cohort: Recent high school graduates (graduated within previous year). “Enrolled” refers to enrollment as first-time, degree-seeking student in fall 2014 at public or private institution, in state or out of state. Trend data spans 2008–2014. Source: USDOE/IPEDS, WICHE • ⁴ Cohort: 18- to 24-year-olds holding high school diploma or GED and not holding a bachelor’s degree in 2010–2012. “Enrolled” refers to enrollment in postsecondary education, at public or private institutions. Source: US Census Bureau, 2010–12 American Community Survey



College Completion

Graduation and Student Success Rates

With national comparisons and trends

On these metrics, **higher numbers** indicate better performance. MA MA
5-Year 1-Year
Trend Change

COMMUNITY COLLEGES

Six-Year Success Rate¹

2014 for MA, 2009 for comparisons



STATE UNIVERSITIES

Six-Year Graduation Rate of First-Time Freshmen² 2014



UMASS

Six-Year Graduation Rate of First-Time Freshmen² 2014



STATE UNIVERSITIES

Six-Year Graduation Rate of Students Who Transfer In³ 2014



UMASS

Six-Year Graduation Rate of Students Who Transfer In³ 2014



Bar Graphs ▲ = Leading State(s) ■ = Massachusetts ▼ = National Average

MA Trend Data ✓ = Improving Performance ⊖ = Flat Performance ⊗ = Worsening Performance



Gaps in Graduation Rates (in percentage points)

With national comparisons and trends

On these metrics, **lower numbers** indicate better performance. **MA** 5-Year Trend **MA** 1-Year Change

COMMUNITY COLLEGES

Three-Year Graduation Rate⁴

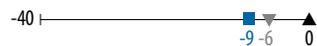
2012–14 (Three-year average)

African-American/White Gap



⊖ ⊖

Latino/White Gap



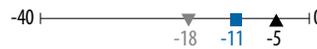
⊖ ⊖

STATE UNIVERSITIES

Six-Year Graduation Rate²

2012–14 (Three-year average)

African-American/White Gap



⊖ ✓

Latino/White Gap



⊖ ⊖

UMASS

Six-Year Graduation Rate²

2012–14 (Three-year average)

African-American/White Gap



⊖ ✓

Latino/White Gap



⊖ ✓

Cohorts and Sources • ¹ Cohort for MA: First-time, degree-seeking students entering in fall 2008; measure examines their rate of success by September 2014. Cohort for national comparisons: First-time, degree-seeking students entering in fall 2003; measure examines their rate of success by September 2009. More recent national data is not available. Source: MDHE, NSC, Jobs for the Future. This metric recognizes the complex mission of community colleges by including both full- and part-time students and capturing students who, within six years of initial enrollment, earn an associate's degree or certificate, transfer to a four-year institution, or are still enrolled with at least 30 credits earned. Data is only available for nine states; because of the small comparison group, national leadership is equated with the performance of the top state, rather than the top five states. • ² Cohort: First-time, full-time, degree-seeking students entering in fall 2008; measure examines their rate of graduation within six years of initial enrollment by 2014. Trend data compares three-year averages for students entering fall 2002–2008 and graduating by fall 2008–2014 respectively. Gap analysis is based on three-year average for students entering fall 2006–2008 and graduating by fall 2012–2014 respectively. Source: USDOE/IPEDS • ³ Cohort: Transfer students entering in fall 2008; measure examines their rate of graduation by 2014. Source: MDHE. • ⁴ Cohort: First-time, full-time, degree-seeking students entering in fall 2009–2011; measure examines their rate of graduation within three years of initial enrollment by 2012–2014 respectively. Trend data compares three-year averages for students entering fall 2005–2011 and graduating by 2008–2014 respectively. Source: USDOE/IPEDS



Workforce Alignment

Trends and Projections in Degrees Awarded

Massachusetts compared with 60% by 2010–2020 Goal

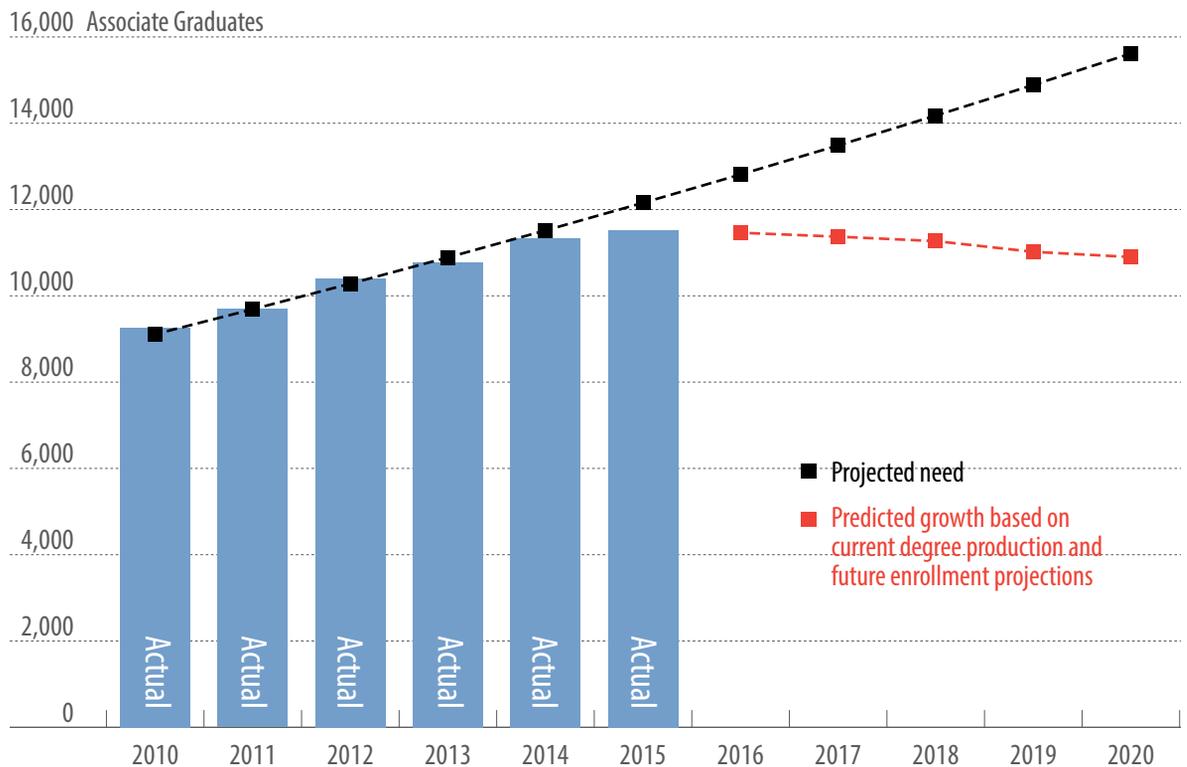
How to read these charts:

These projections began with calculations of the number of college graduates that Massachusetts would need each year, beginning in 2010, to meet the goal of 60% of residents holding a college degree by 2020.

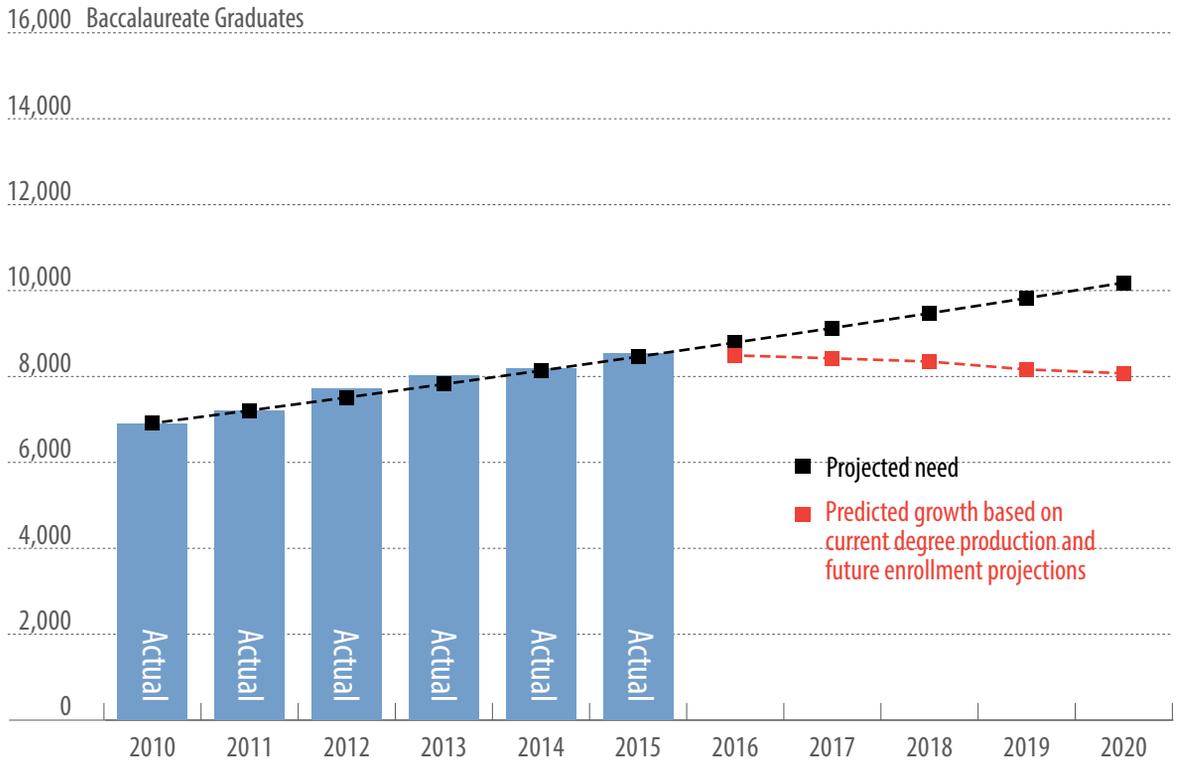
To better align this goal with Massachusetts' specific workforce needs, this total number of graduates was broken out by degree type—associate's, bachelor's, and graduate—using projections from Georgetown's Center for Education and the Workforce.

Because this report focuses on Massachusetts' public campuses, degree totals were then broken out by public and private share using the current split in Massachusetts for each degree type. Only the public share is shown here; the charts do not show the projected need for or growth in private college graduates.

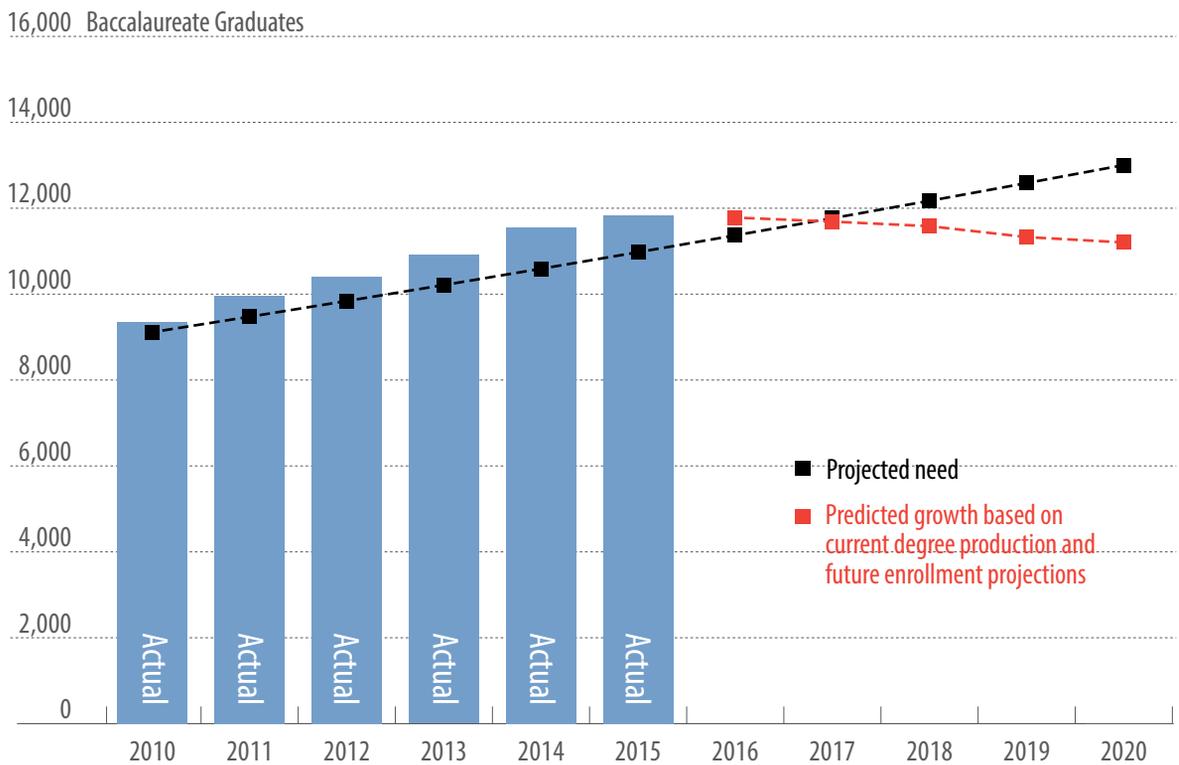
COMMUNITY COLLEGES Associate Degrees Awarded in All Fields



STATE UNIVERSITIES
Bachelor's Degrees Awarded in All Fields



UMASS
Bachelor's Degrees Awarded in All Fields



Source for all Trends and Projections in Degrees Awarded graphs • MDHE with data from WICHE, NCHEMS, Georgetown Center for Education and the Workforce, USDOE/IPEDS.



Workforce Alignment (cont'd)

Trends in Degrees Awarded in High-Need Fields

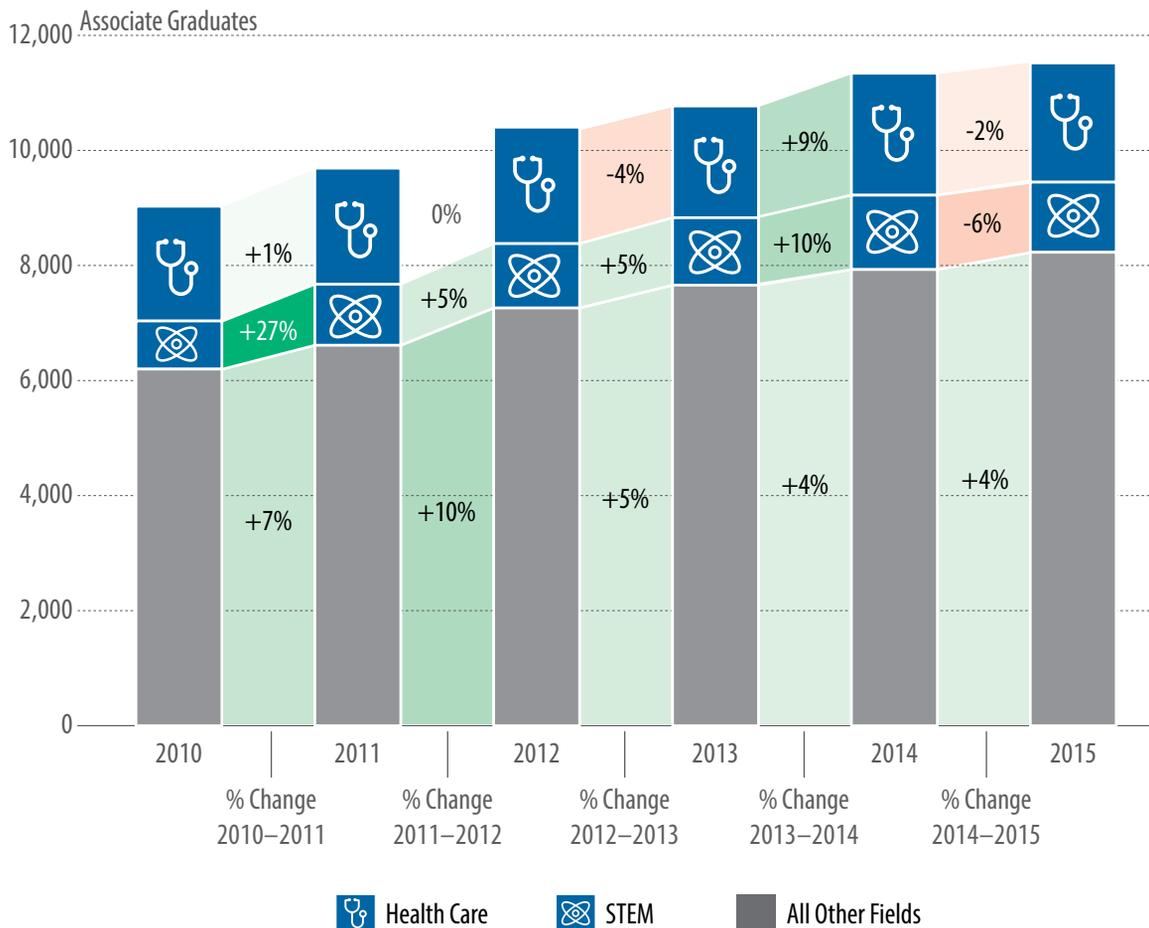
How to read these charts:

High-Need Fields: While graduates of Massachusetts' public campuses are employed in a wide range of fields, the three fields included in this metric—Health Care; STEM (Science, Technology, Engineering & Mathematics); and Business & Finance—show both a high level of projected growth and a high number of future vacancies. For example, Health Care, STEM and Business & Finance represent 38 percent of jobs in 2020 projected to require a bachelor degree.

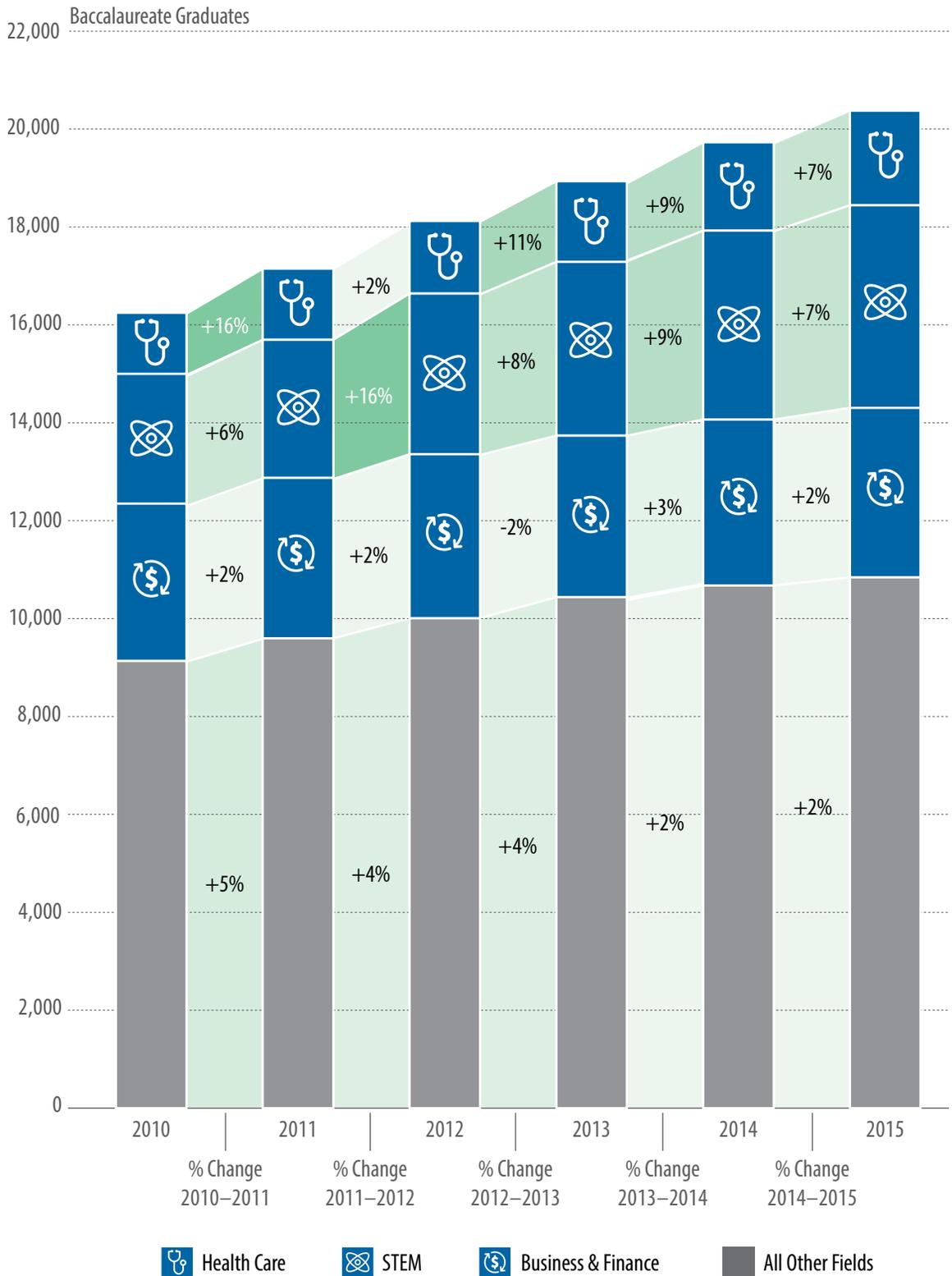
Graph Components: The blue sections of the stacked bar graphs show the number of degrees awarded in each high-need field in the given year; the gray sections show the remaining number of degrees awarded in other fields that year. The spaces between each stacked bar show the annual percent change in degrees awarded in each category, both numerically and with a heat map representation. Shades of green indicate growth, with deeper shades of green indicating stronger growth. Shades of red indicate decline, with deeper shades of red indicating sharper declines.

COMMUNITY COLLEGES

Associate Degrees Awarded in High-Need Fields



STATE UNIVERSITIES & UMASS
Bachelor's Degrees Awarded in High-Need Fields



Source for all Trends in Degrees Awarded in High-Need Fields graphs • MDHE.

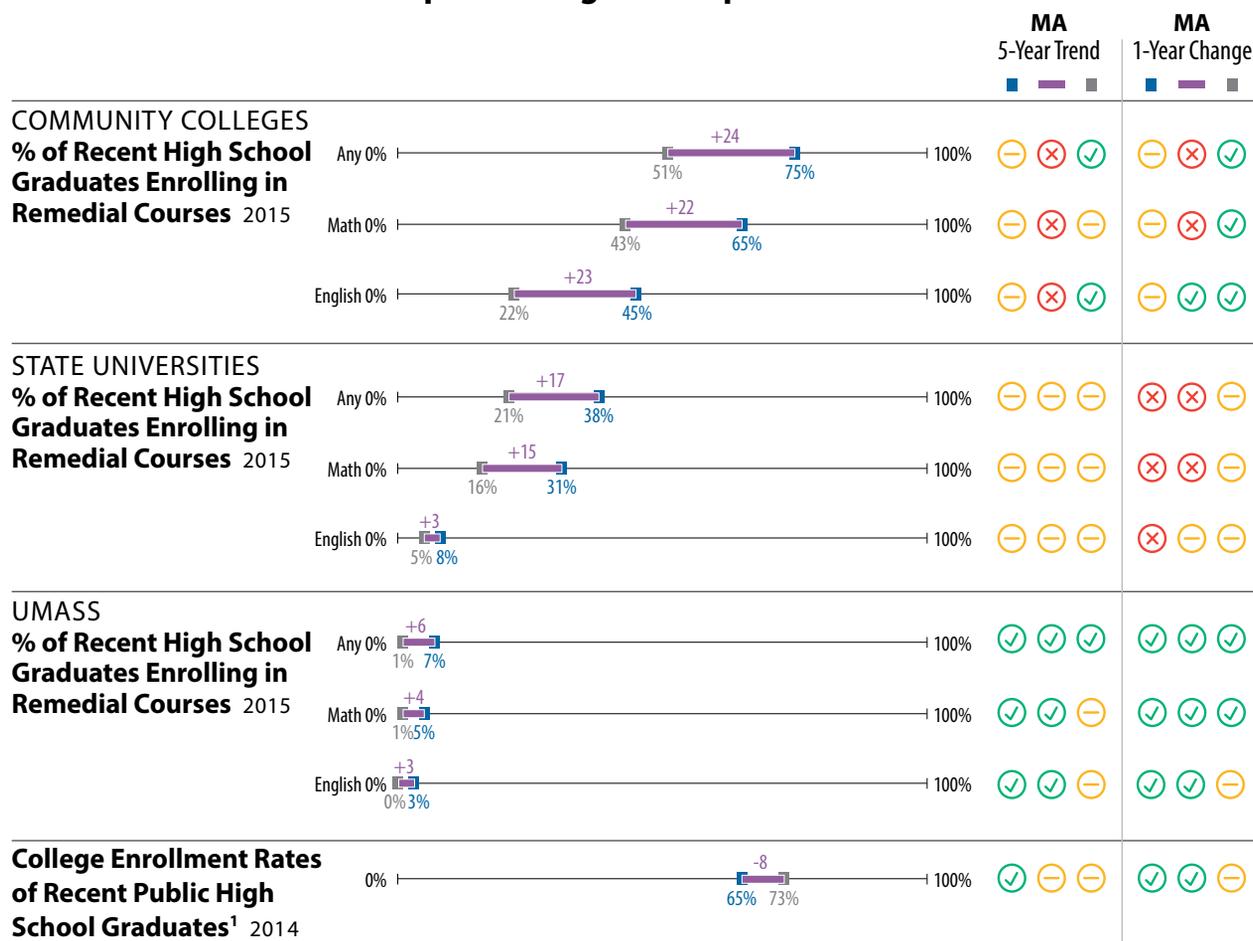


Closing Achievement Gaps

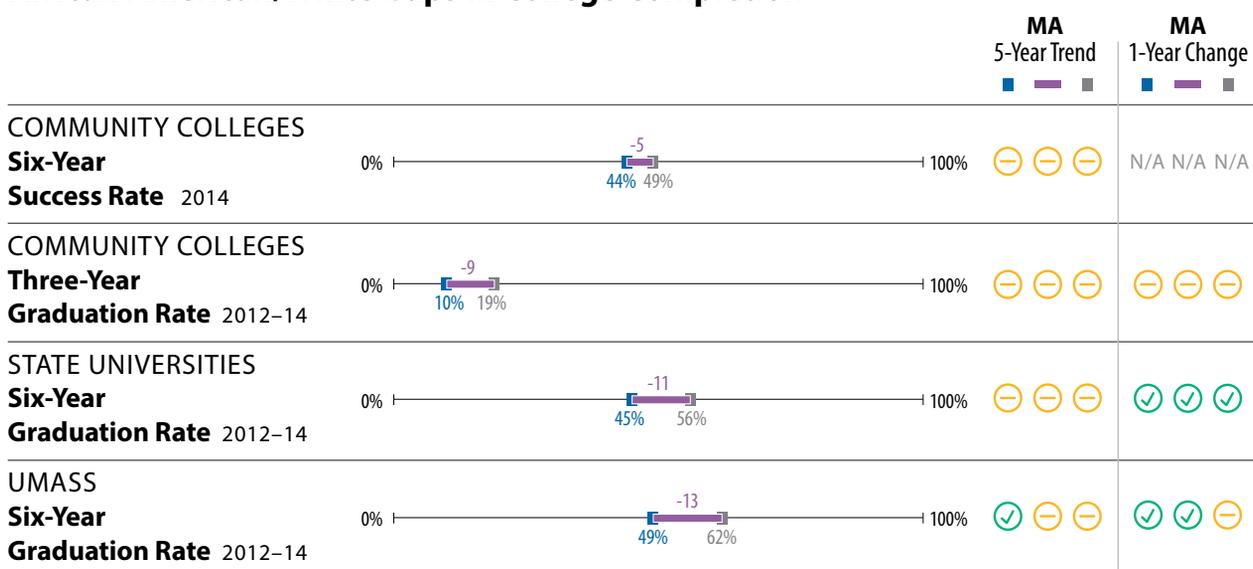
African American/White Gaps & Latino/White Gaps—All available Massachusetts data



African American/White Gaps in College Participation



African American/White Gaps in College Completion

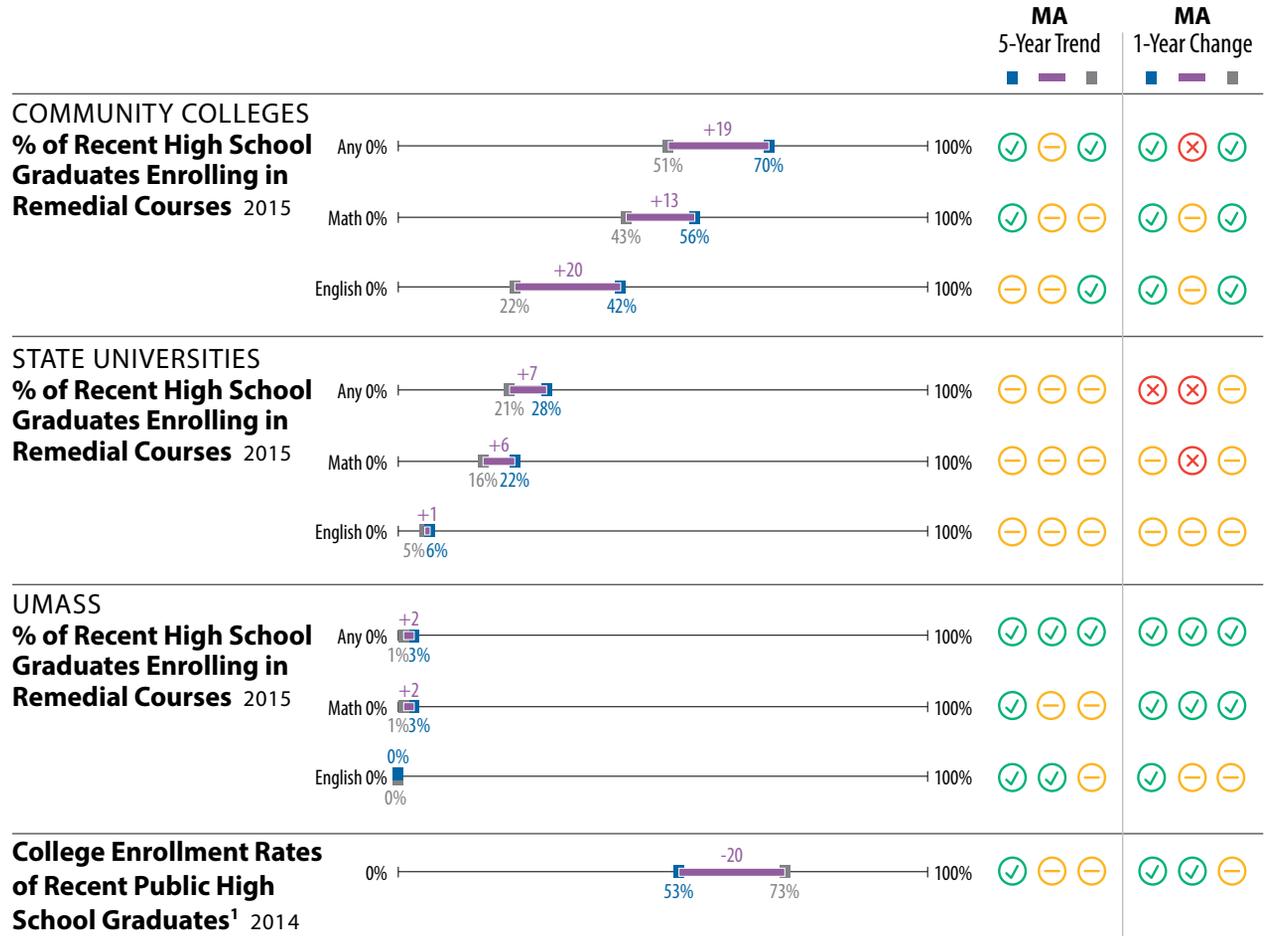


Comparison Group Icons ■ = African American or Latino/a ■ = White — = Size of Gap

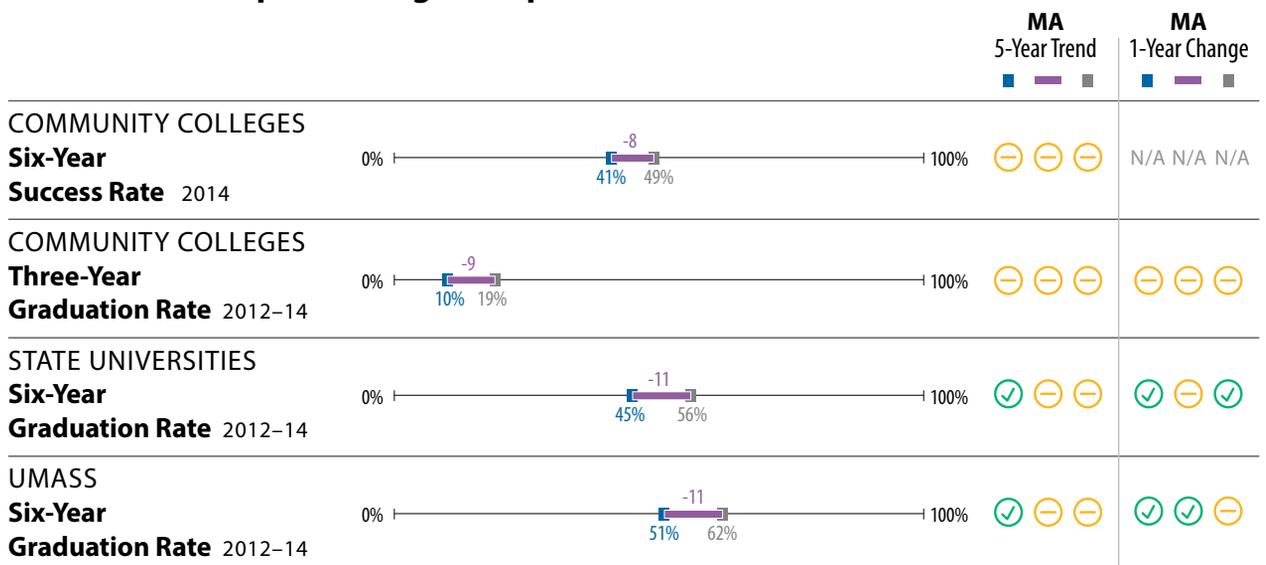
MA Trend Data ✓ = Improving Performance ⊖ = Flat Performance ⊗ = Worsening Performance



Latino/White Gaps in College Participation



Latino/White Gaps in College Completion



¹ Cohort: Massachusetts public high school students graduating in 2013. The measure is the percent enrolling in college in the immediate fall term after high school graduation. Trend analysis is based on 2006–2013 graduating classes. Source: MDHE, MDESE, NSC.



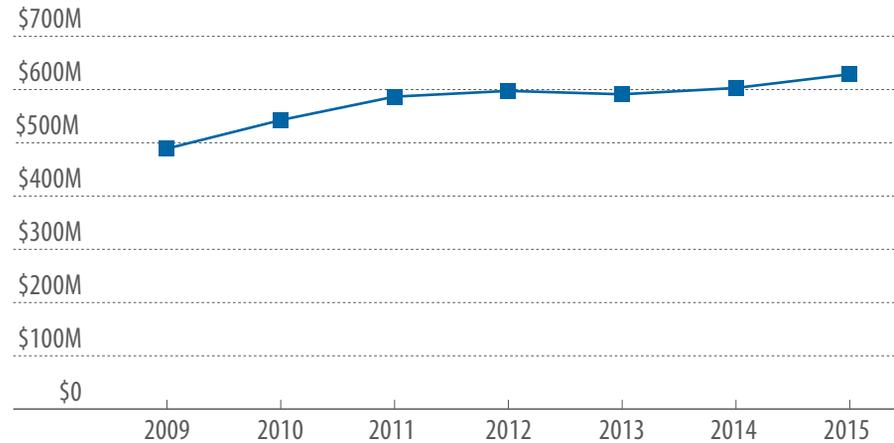
Research

Research and Economic Development Data

With trends

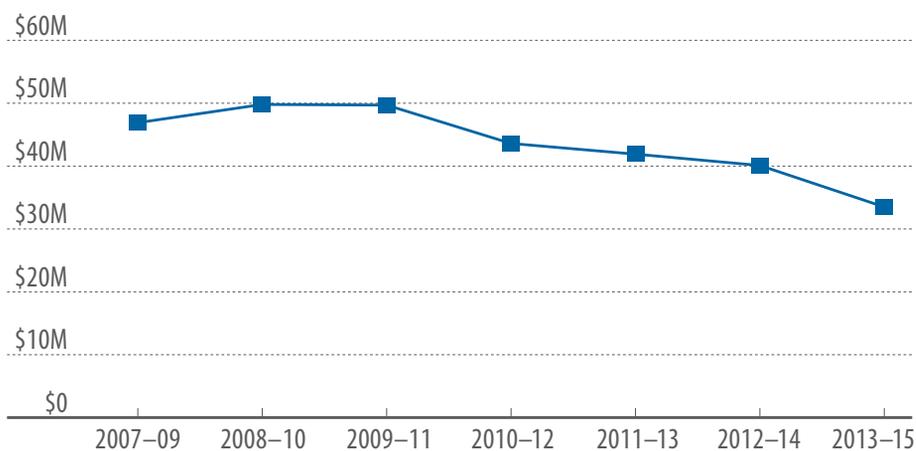
UMASS

Trend in Research and Development Expenditures¹ 2009–15



UMASS

Trend in Licensing Income² 2007–15 (Three-year averages)



Sources • ¹UMass President's Office / National Science Foundation. • ²UMass President's Office / Association of University Technology Managers

DATA SOURCE ACRONYM GLOSSARY

Georgetown CEW

Georgetown University Center on
Education and the Workforce

HEGIS

Higher Education General
Information Survey (USDOE)

IPEDS

Integrated Postsecondary
Education Data System (USDOE)

MDESE

Massachusetts Department of Elementary
and Secondary Education

MDHE

Massachusetts Department of Higher Education

NCES

National Center for Education Statistics (USDOE)

NCHEMS

National Center for Higher Education
Management Systems

NSC

National Student Clearinghouse

NSF

National Science Foundation

USDOE

United States Department of Education

WICHE

Western Interstate Commission for
Higher Education

ADDITIONAL RESOURCES AT WWW.MASS.EDU/VPREPORT

Data Tables for all graphs in this report

Index of Leading States for each metric

Supplemental Metrics

Technical Appendix

The Massachusetts Department of Higher Education acknowledges with gratitude the encouragement, support and counsel of leaders of state government, including members of the Great and General Court, as well as the assistance of the philanthropic community.

State Government

Governor

Charlie Baker

Secretary of Education

Jim Peyser

Massachusetts Board of Higher Education

Chris Gabrieli, *Chairman*

Sheila Harrity, *Vice Chair*

Jim Peyser, *Ex Officio*

Nancy Hoffman

Tom Hopcroft

Donald R. Irving

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