

Beyond College Credit: Leveraging AP as an Effective Workforce Strategy

— Dr. Dana Ansel

Increasing the number of workers with an education beyond high school, and preferably with a four-year college degree, is an economic imperative and is also critical to give workers and their families greater economic stability and security. Most of the jobs being created in Massachusetts require workers who have a college degree. Although Massachusetts is the most well-educated state in the country, educational attainment is uneven across different racial, ethnic, and socioeconomic groups, and the workers who represent an increasing share of the state's labor force are less likely to attend and graduate from college. As a result, there are significant questions about whether there will be enough workers to meet the needs of the growing

industries in Massachusetts. Of particular concern is the pipeline for future Science, Technology, Engineering, and Mathematics (STEM) workers because of the substantial impact STEM jobs have on the state's economic prosperity. Research by a wide range of scholars consistently finds that rigorous coursework in high school matters for a student's future success in college and beyond. The Advanced Placement (AP[®]) program is an effective strategy for high-school students to take advanced coursework and has been shown to prepare students for success both in college and beyond. The AP program can contribute to solving this economic challenge, but only if steps are taken to identify, prepare, and support underserved students.

Five Big Ideas

- Massachusetts's continued economic prosperity relies on increasing the number of workers who have a college degree, and there is a particular need for workers who have STEM skills.
- The racial and ethnic mix in Massachusetts is becoming increasingly diverse, and future growth in population and workers in Massachusetts depends on students of color.
- Research consistently finds that taking rigorous courses in high school prepares students for success in both college and the labor force.
- The Advanced Placement (AP) program is an effective strategy for increasing students' access to advanced coursework, especially among students of color.
- Expanding access without compromising quality will require: supporting high schools, better aligning AP outcomes with college credit policies, and identifying the unmet need.

An Economic Imperative:

The new normal is an economy that rewards workers with advanced degrees and higher levels of skills, while penalizing those with a high school degree or less. As the United States economy has fundamentally changed, so too have the education and skills required to achieve economic security. The Great Recession of 2008 intensified the existing trends. Since January 2010, 11.5 of the 11.6 million jobs created in the United States went to workers who had at least some college education.¹ A college education offered some protection for workers during the downturn, and was advantageous during the recovery. The types of jobs lost during the Great Recession and the types of jobs added during the recovery widened the already large divide of economic well-being between workers by level of

education.

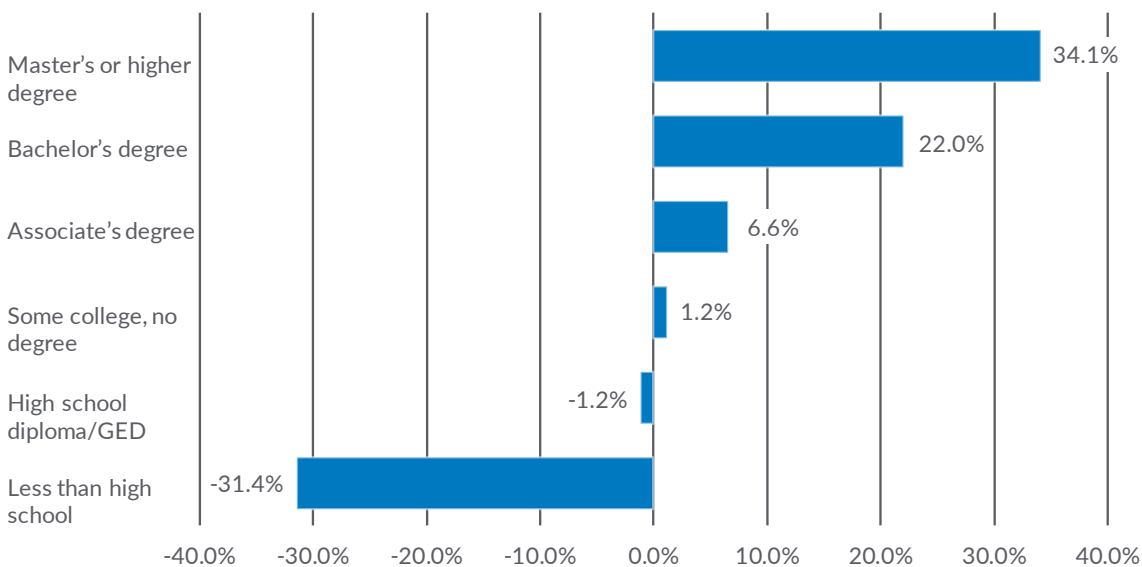
The future appears to hold more of the same. By 2020, 65 percent of all jobs – existing and newly created – in the United States will require education and training beyond high school, according to research done by the Center on Education and the Workforce at Georgetown University.² In Massachusetts, that number is even higher, with 72 percent – nearly three-quarters – of all jobs by 2020 projected to require education beyond high school.³ Three of the state’s four fastest growing industries - Health Care & Social Assistance, Educational Services, and Professional & Technical Services - disproportionately require workers who have a bachelor’s degree or higher. Since 2000, nearly all of the job growth in Massachusetts has been filled by workers with an associate’s degree or higher, and most of those workers have at least a bachelor’s

degree.⁴ (See Figure 1.)

The worker pipeline with Science, Technology, Engineering, and Mathematics (STEM) skills is of particular concern.* While only a small fraction of the state’s overall jobs, a wide range of experts agree that STEM fields have a disproportionate impact on innovation, productivity, and economic growth. In addition, demand for workers with STEM skills is broad including for non-STEM occupations, because the underlying competencies are highly valued. Workers with STEM skills have access to better career choices and higher earnings, either in STEM jobs or in other jobs. The vast majority of STEM jobs require some education or training beyond high school.⁵ In 2018, STEM jobs will account for nearly one tenth of all jobs in Massachusetts. Ninety-four percent of these jobs will require some education or training beyond high school, and more than three-

Figure 1

Percent Change in the Number of Employed Individuals by Educational Attainment in Massachusetts, 2000 to 2012-2014



Commonwealth Corporation (2016). *Closing the Skills Gap: Meeting the Demand for Skills in a Growing Economy*, p. 9.

*We use the term “STEM skills” to refer a broad range of knowledge, skills, abilities, work interests and values. Some of the skills include critical thinking, complex problem solving, deductive and inductive reasoning, and mathematical reasoning. For a full list of STEM competencies, see Carnevale, Anthony, Nicole Smith, and Michelle Melton. (2011). *STEM: Science, Technology, Engineering, and Mathematics*. Washington, D.C.: Center on Education and the Workforce, p. 8.

quarters of them will require a four-year college degree or more.⁶ There are already difficulties in filling jobs in the biopharmaceutical sector in Massachusetts.⁷ A shortage of workers could limit the state's job and economic growth. Going forward, there is a strong economic need for a strategy to instill STEM skills in a broad range of students.

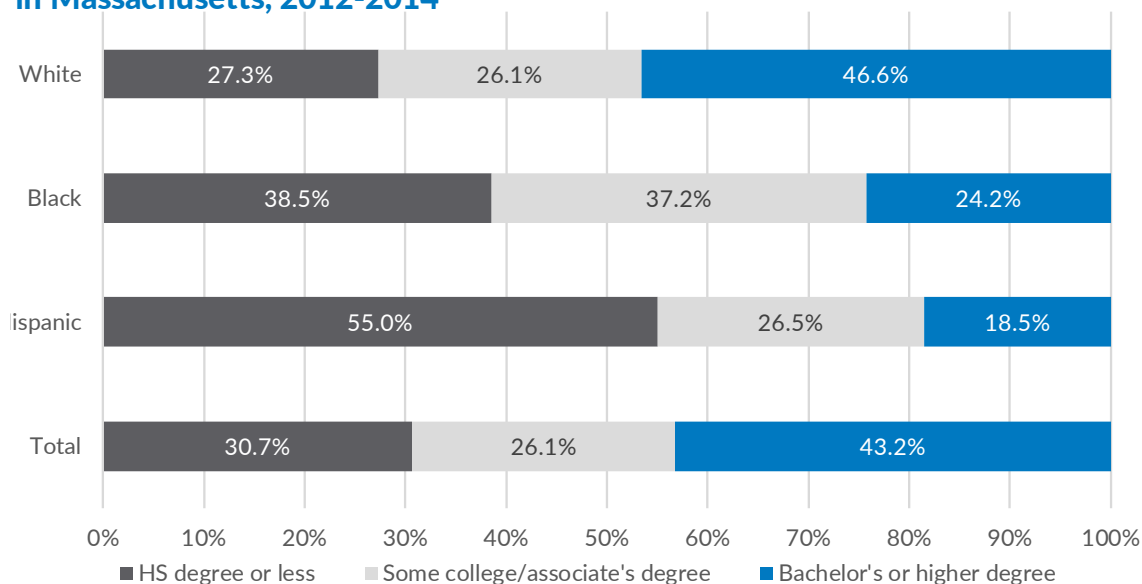
The College and Workforce Gap

A gap still exists between the number of jobs that require a college degree and the number of workers who have a college degree, even though the number of people continuing their education past high school has grown considerably in the last 50 years. Concerns about having enough skilled workers exist across the country, including in Massachusetts. The population of Massachusetts is aging. Forty-five percent of the labor force is at least 45 years old, and the state's baby boomers, many of whom are highly educated, are starting to retire.⁸ Meanwhile, the number of people who are earning new college degrees is stagnating. According to MassINC research, in each decade between 1990 and 2010,

Massachusetts averaged about 250,000 new college degree holders in their prime working age. In sharp contrast, from 2010 to 2030, it is projected that the state's prime-age college-educated population will increase by less than 50,000 new college-degree holders per decade.⁹ This potential decline raises significant questions about whether there will be sufficient workers to fuel the state's continued economic growth and prosperity.

Although Massachusetts is the most well educated state in the country, educational attainment is uneven across different racial and ethnic groups. Overall, 43 percent of workers in Massachusetts have a BA or higher. Yet, while 47 percent of white workers have a BA or higher, only 24 percent of Black and African American workers and 19 percent of Hispanic workers have a BA or higher.¹⁰ (See Figure 2.) At the same time, the racial and ethnic mix of the population in Massachusetts is becoming increasingly diverse. Since 2000, the share of people who are Hispanic, Black/African American, and Asian has grown. At the same time, the share of the state's

Figure 2
Educational Attainment of the Labor Force by Race/Ethnicity in Massachusetts, 2012-2014



Commonwealth Corporation (2016). *Closing the Skills Gap: Meeting the Demand for Skills in a Growing Economy*, p. 18.

population that is white decreased from 82 percent to 75 percent.¹¹ The workers who represent an increasing share of the state’s labor force are less likely to have a college degree.

Closing the gaps in college graduation rates requires attention to the different steps that students must complete along the way to a college degree, such as graduating from high school and enrolling in a college. Thus, a focus on increasing the number of college graduates requires attention to different steps along the way. Increasing college readiness, college enrollment, and college persistence are all steps toward college graduation. There are some positive signs: national high school graduation rates have increased, including among students of color, and more high school graduates are enrolling in college.¹² Yet, challenges remain. Nationally, there are still hundreds of high schools with low graduation rates where a disproportionately large number of Black/African American and Hispanic students attend

school.¹³ In Massachusetts, in 2017, the statewide graduation rate was 88 percent; yet, there were still 33 high schools with a graduation rate less than 80 percent.¹⁴ It is not possible to meet the demands of the job market without creating successful pathways to and through college for underserved students.*

Persistent educational gaps exist in Massachusetts. The college readiness gaps between Black/African Americans and whites as well as between Hispanics and whites, measured by proficiency on the 12th Grade National Assessment of Education Progress (NAEP), are larger in math in Massachusetts than the national average. (See Figures 3, 4.) There are some positive signs regarding the gaps in college enrollment. (See Figure 5.) Notably, the Black/African American-white gap in college enrollment of 18-to-24 year olds in Massachusetts is smaller than the national average and has been improving over the last five years. There has also been recent progress in closing the college graduation gap between Black/

Figure 3
Massachusetts Black/African American-White College Readiness Gaps

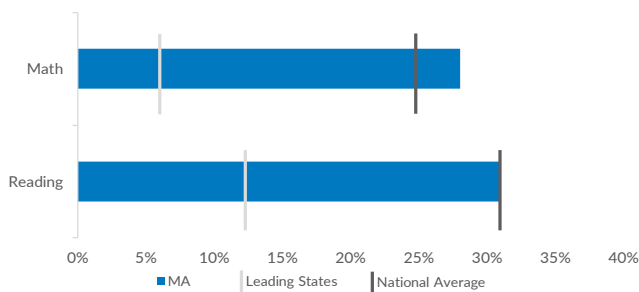


Figure 4
Massachusetts Latino-White College Readiness Gap

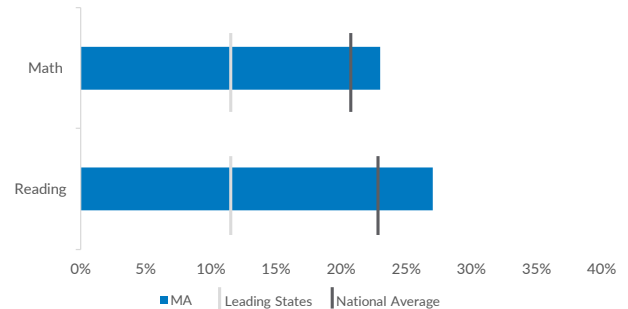


Figure 5
Massachusetts College Enrollment Rates of 18 to 24 Year Olds



Massachusetts Department of Higher Education (June 2016). *The Degree Gap: Honing in on College Access, Affordability & Completion in Massachusetts*, pp. 51-55.

* We use the word “underserved” to refer to low-income, Black and African American students, and Hispanic students. There is obviously overlap between these different groups of students which is captured by the word “underserved.”

African American and white students at public state universities and UMass, but the five-year trend has been static. (See Figure 6.) In contrast, the gap in college enrollment between 18-to-24-year-old Hispanic and white students is larger than the national average and has not improved over the last five years. (See Figure 5.) In addition, the five-year trend for closing the gap in college graduation rates between Hispanic and white students at public state universities and UMass has also been static, although there has been recent progress in closing the gap at the UMass system.¹⁵ Closing the college gap will require redoubling efforts to increase college readiness, college enrollment, and college persistence with a targeted focus on underserved students.

Closing the Gap: The Importance of Rigorous Coursework in High School

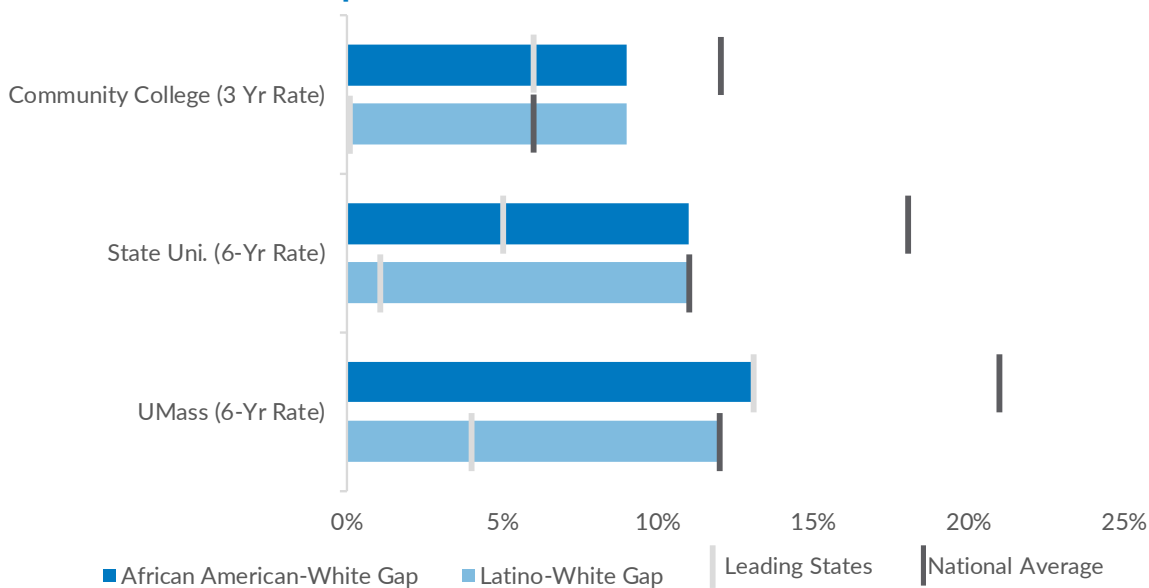
Increasing the number of workers with an education

beyond high school, and preferably with a four-year college degree, is an economic imperative and is also critical to give workers and their families greater economic stability and security. This recognized need has spawned a variety of efforts to increase college readiness, college enrollment, college persistence – and ultimately college graduation rates. It is safe to say there is no one solution to this challenge, but the issue is too important to spend time and money on ineffective efforts. Research can help point toward strategies that have been shown to work.

The research consistently finds that taking rigorous courses in high school positively impacts college enrollment and college success. In his groundbreaking longitudinal research, Clifford Adelman found that the “quality and intensity of high school curriculum” was the factor best associated with students who enrolled in college and earned

Figure 6

Massachusetts Gaps in Graduation Rates



Massachusetts Department of Higher Education (June 2016). *The Degree Gap: Honing in on College Access, Affordability & Completion in Massachusetts*, pp. 51-55.

a bachelor's degree by their mid-20s. Adelman explains, "The academic intensity of the student's high school curriculum still counts more than anything else in precollegiate history in providing momentum toward completing a bachelor's degree." (p. xviii) Adelman prefers the term "intensity," rather than "rigor," but both terms refer to courses that require a high concentration of intellectual effort. In addition, the highest level of math a student takes in high school has been shown to be a key indicator of future success in college. In fact, every step up the math ladder multiplies the odds of a student earning a college degree.¹⁶ Adelman's comprehensive analysis leads him to conclude that the first year of postsecondary education must begin in high school, either through AP courses or other structured efforts.¹⁷ The courses that students take in high school are important keys to success in college, and students who take academically rigorous courses in high school are better positioned to earn a college degree.

The expert panel of a *What Works Clearinghouse* practice guide on how to help students navigate the pathway to college reaches similar conclusions. After reviewing extant research about how to best help students enroll and succeed in college, the panel's first recommendation is: "Offer Courses and Curricula That Prepare Students for College-Level Work, and Ensure that Students Know What Constitutes a College-Ready Curricula by 9th Grade." The authors emphasize two complementary and necessary steps: 1) high schools must offer such courses and 2) they must advise students to take these courses.¹⁸

Taking rigorous math courses in high school is also associated with increased future earnings. Researchers find that the math courses that students take in high school are strongly related to their

earnings 10 years later. This effect is true even after taking into account a student's demographic, family, and school characteristics, as well as a student's educational attainment, college major, and occupation. The researchers also control for student ability as indicated by math GPA and test scores. Moreover, more advanced math courses have a larger effect on earnings than less advanced courses.¹⁹ Other research reaches similar conclusions, finding that implementing high-quality college-preparatory programs in urban high schools can both improve educational outcomes and increase earnings.²⁰

Access to rigorous courses in high school coupled with advising students to take rigorous courses are critical steps to enable student success. The courses that students take in high school make a difference in terms of their long-term outcomes, including their future earnings.

The Role of Advanced Placement Courses

The research is clear that rigorous coursework in high school matters for a student's future success in college and beyond, and there are a variety of strategies to increase high school students' access to rigorous courses, including the Advanced Placement program. AP courses offer important advantages to students and schools, because AP courses are specifically designed to teach college-level work in high school. At the end of the course, students take an exam, which is the same for students across the country and is graded externally. The exam is scored on a scale of 1 to 5, with 5 being the highest score and 3 considered a qualifying or passing score. The transparency of the content of AP courses and the national exam offers a standard benchmark of a student's mastery of content and skills, which provides an additional advantage of the AP program

as compared with other efforts to offer rigorous coursework.²¹

Independent research consistently confirms the quality of AP courses. In one study, five scholars were asked to consider the content, rigor, and clarity of the materials of the English, History, Calculus, and Biology exams. Researchers found the tests to be superior to nearly all of the state standards and other exams reviewed, despite some recommendations for improvement. The researchers attribute the success of the AP program to the fact that the program sets high academic standards and goals that are well defined for teachers and for students and their families. In addition, AP exams are well aligned to academic standards, while also requiring students to demonstrate proficiencies beyond simply the course content. In the report's forward, Chester Finn and Mark Davis explain, "Students are also expected to make sense of complex, and sometimes contradictory, materials; to write and defend their opinions about these materials intelligently; and to apply their knowledge in creative and productive ways." The ability to earn college credit for their effort is a motivating factor for students' persistence in the program. AP courses provide students with a nationally recognized way to engage in college-level coursework in high school and earn college credits for exemplary exam performance.²²

Several noteworthy findings emerge from the research on the impact of AP courses.²³ First, the biggest impact of the AP program is for students who take the AP exam and earn a qualifying score. Those students go on to do significantly better in courses in that subject in college. In the science fields, students who pass AP exams in biology, chemistry, or physics do better in college courses in those areas. Second, students who pass the AP Calculus exam are much

more likely to major in the physical sciences or engineering than other students.²⁴

While the best outcomes occur if students earn a qualifying score on an AP exam, research has still found value in students taking an AP course, even if they do not take an exam or if they do not earn a qualifying score on an exam. In a study of Texas public high school graduates, researchers found that the students who did the best were students who took AP courses and AP exams. They did better in college and had higher graduation rates compared with students who did not participate in the AP program. They also did better than those students who took AP classes but did not take an AP exam. Students who took AP classes but not the exams performed better in college than the students who did not participate in the AP program. In addition, the study found that even students who earned a 2 on the AP exam, which is not considered a qualifying score, did better in college than students who did not participate in the program.²⁵ Overall, there was value to participating in the AP program for all students.

Other research finds that taking an AP course improves students' chances of persisting in college.²⁶ The study compares students by different socioeconomic and achievement levels. Students who took an AP course are more likely to persist than students who did not, comparing students of similar socioeconomic backgrounds and achievement levels. The study found that the greatest increase in persistence was for lower-income and lower achievement students who take an AP course. In addition, taking more AP courses is also associated with a higher probability of persisting in college. The study did not find a difference between the persistence rates of students who earned a

qualifying score on an AP exam and students who took AP courses.²⁷ Taking an AP course improves persistence in college, even if a student does not earn a qualifying score.

The number of students taking AP exams has grown considerably since the program's inception and especially in recent decades.²⁸ The growth has led to questions about whether the program has maintained its rigor and quality. Recent research examined this question by looking at math achievement test scores and found no evidence that expansion has changed or weakened the program. At the same time, the number of students of color taking AP courses has more than doubled, although the relative gaps between different races have remained consistent over time.²⁹ As the AP program has expanded, it has maintained its quality and also reached a broader range of public school students.

Advanced Placement courses are offered in most public high schools. The schools that lack an AP program tend to be small and rural. While the size of AP programs varies across schools, 91 percent of high school students attend schools that offer at least one AP course.³⁰ However, despite their widespread availability, in 2010, only 11.7 percent of high school students who attended a school with AP classes took an AP course, and those were likely to be more advantaged students. Middle-class and high-income students are three times as likely as low-income students to enroll in an AP course. Black/African American students participate in AP courses at half the national rate. At a national level, it has been estimated that if low-income students and Black/African American, Hispanic, and American Indian students were to participate in AP courses at the same rate as other students, there would be more than 600,000 additional students taking AP

courses.³¹

For the most part, those “missing” AP students attend schools that already offer AP courses, but they are not enrolling in them. The majority of the AP gap exists within high schools, not between high schools.³² While some of the gap may be explained by the lack of readiness to take AP courses, there are also many students with the potential to benefit from AP courses who are not currently enrolled in them. Based on PSAT scores, one indicator of readiness for AP courses, there are a substantial number of underserved students who have the potential to benefit from the AP program. These students – the “missing” AP students – are missing out on an opportunity that could help put them on a path to success in college and in the labor market.

Success in AP Courses

AP courses and exams offer an opportunity for students to take rigorous coursework in high school, which is then associated with better outcomes in college and the labor force. Other potential benefits, such as increasing a student's chance of college admission or making college more affordable, are not the focus of this policy brief. Yet, there are often requirements or barriers to enrolling in AP courses, which limit the pool of students who can take advantage of them. Some schools have moved away from this approach, instead embracing open access to AP courses. Success, however, should not be viewed as enrolling students into AP courses; there is also an imperative to support students so that they can succeed, starting from earlier grades so that they are ready to take AP courses in high school. In high school, students must be supported, and AP teachers often need additional training to be able to effectively teach the material.

Research that examined the practices of schools

that successfully serve underserved students found that open access to AP courses can work if access is coupled with the following ingredients: teachers who are trained and supported, a school schedule that promotes AP enrollment for everyone, a school culture focused on success for all students, and extra tutorials and interventions for students who need help.³³ After reviewing research about the AP program, researchers at Stanford reached similar conclusions about the conditions for student success. Not all AP courses are created equally, and simply creating an AP program is not sufficient to improve student learning. The programs that have had a positive impact tend to be part of a larger reform effort and include support for both students and teachers.³⁴ The expansion of the AP program at South High Community School in Worcester, Mass. shows how an urban high school was able to switch to embracing an open-access policy for all students. South High switched the paradigm from “these kids can’t” to “these kids can” by finding, recruiting, and supporting students who had been “missing” from the AP program (see page 16). For the AP program to be an effective pathway to opportunity for underserved students, there must be a collective responsibility to identify, prepare, and support students and teachers, with this responsibility shared between school leaders, teachers, and students.

The AP Program in Massachusetts

For the second consecutive year, Massachusetts has led the nation in the share of seniors earning a qualifying score on an AP exam. The number of students in Massachusetts participating in AP exams has increased in recent years, with nearly half of seniors (46%) in the class of 2017 taking at least one AP exam while they were in high school. More than 32 percent of class of 2017 students at public high schools earned a qualifying score of 3 or higher.

Both the participation rates and the share of students earning a qualifying score in the Commonwealth have increased compared with the previous year, and Massachusetts has had the country’s largest 10-year increase in performance on AP exams.³⁵ These gains have come at a time when the state has actively invested in expanding access to AP courses.

The number of underserved students in Massachusetts who participate in the AP program and who take AP exams has also grown substantially in the last decade. Between 2007 and 2017, the number of AP exams that Hispanic high school graduates took increased from 1,761 to 9,200 (422% increase). For Black/African American high school graduates, that number increased from 1,078 to 4,592 exams (326% increase). And, for low-income high school graduates, the number of AP exams increased from 4,492 to 20,325 exams (352% increase).³⁶

During this decade of rapid expansion, the number of underserved students in Massachusetts earning a qualifying score has increased substantially, despite slight declines in the share receiving a qualifying score. In 2017, Hispanic high school graduates earned a qualifying score on 4,314 exams, compared with 893 qualifying scores in 2007. Similarly, Black/African American students earned qualifying scores on 1,434 exams in 2017, compared with 440 qualifying exams in 2007. In 2017, low-income students earned qualifying scores on 8,787 exams, compared with 2,115 qualifying exams in 2007.³⁷ (See Figures 7,8,9.) Overall, many more underserved students earned a qualifying score on an AP exam, although there is clearly more work to be done to make sure underserved students are adequately prepared and supported to succeed in AP courses and exams.

Through a variety of initiatives, the Massachusetts Department of Elementary and Secondary Education (ESE) is committed to improving the academic performance of all students and increasing the number of students who are interested in and prepared for postsecondary education and STEM careers. One initiative with support from the Governor and the Legislature is the Advancing STEM through an Advanced Placement Science and Mathematics Program (Advancing STEM), which began in 2013. This program aims to increase access, participation, and success in AP math and science programs, particularly for underserved students, and to increase teacher effectiveness in these content areas. The initiative focuses on increasing the number of students who take math, science, and English AP exams. To pursue these goals, ESE has partnered with Mass Insight Education & Research (Mass Insight or Mi).³⁸ This program continues and expands the work of Mass Insight. Mass Insight

received a grant from the National Math and Science Initiative in 2007 to lead a partnership between the Commonwealth of Massachusetts, school districts, and private funders to address the challenge of math and science education in the U.S. The program combines high quality professional development, instructional support, and summer training for AP teachers with student supports, including additional learning time in Saturday study sessions and mock AP exams. To date, over 50,000 students in more than 125 schools across the Commonwealth have participated in Mi's AP program.³⁹

The Mi program has been a key part of the state's strategy to expand access to and success in the AP program in Massachusetts and has contributed to large and sustained growth in students' access to and performance in math, science, and English AP courses, especially among underserved students. In the first three years of implementing the Mi program, the number of math, science, and English AP exams

Figure 7
Mass. Qualifying Score, 10 Year Increase

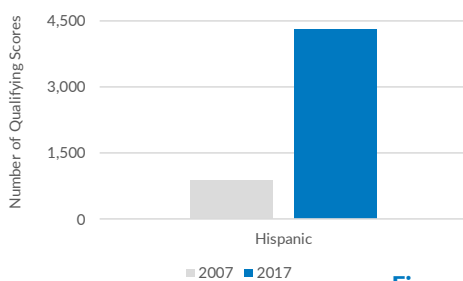


Figure 8
Mass. Qualifying Score, 10 Year Increase

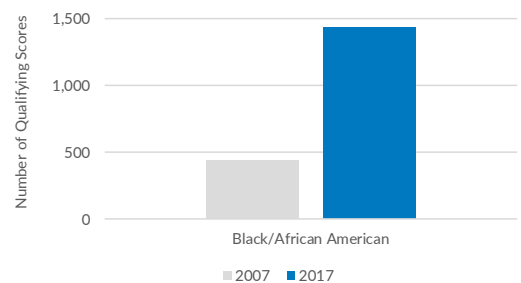
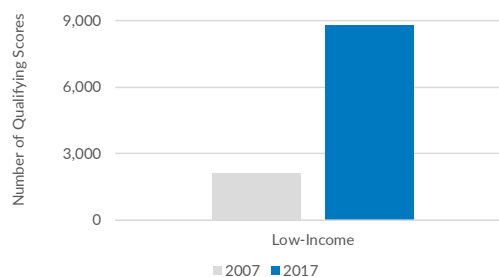


Figure 9
Mass. Qualifying Score, 10 Year Increase



that students take typically doubles and the number of qualifying scores also typically doubles. The program builds the capacity of the schools and teachers such that after three years in the program, schools are able to sustain these increases. As noted above, the number of Black/African-American students, Hispanic students, and low-income students taking AP exams and earning a qualifying score in Massachusetts has increased substantially over the past decade, and students at schools who participate in the Mi program have been a significant driver of these statewide gains.

In particular, the Mi program provides underserved students with increased access to AP exams in math, science, and English. In 2016-17, students who attended schools that participated in Mi's program (either currently or previously) in Massachusetts accounted for:

- 51 percent of all math, science, and English exams taken by Hispanic students;
- 49 percent of all math, science, and English exams taken by Black/African American students; and
- 60 percent of all math, science, and English exams taken by low-income students.

In addition to increasing participation, students who participated in the Mi program also accounted for a large share of qualifying scores on exams. In 2016-17, students who attended schools that participated in Mi's program (either currently or previously) in Massachusetts accounted for:

- 35 percent of the qualifying scores achieved by Hispanic students on math, science, and English exams;
- 34 percent of the qualifying scores achieved by Black/African American students on math, science, and English exams; and
- 50 percent of the qualifying scores achieved

by low-income students on math, science, and English exams.⁴⁰

The independent evaluation by the University of Massachusetts Donahue Institute reaches similar conclusions regarding the positive impact of the program on the number of students taking and passing AP courses. The research found that the Advancing STEM AP program had a positive effect on the number of students taking and passing English, math, and science AP courses. On average, the percentage of students taking and passing one or more English, math, or science AP course increased by 5 percentage points more at participating schools than at similar non-participating schools the year participation began. The research also found a positive impact on female students, with significantly more female students who took and passed AP courses compared with male students at participating schools.⁴¹ The Mi AP program has increased access to and success in AP exams for underserved students; yet, at the same time, the remaining gaps in participation and success on the exams indicate that there is still more work to be done to expand opportunity and enable all students in Massachusetts to succeed.

Additionally, research has shown that students who participate in Mi AP programs go onto greater success in college. Overall, 81 percent of students who participated in the Mi program between 2009 and 2014 enrolled in a two- or four-year college. College enrollment rates for underserved students are close to 80 percent, which is higher than the rates for underserved students overall in the Commonwealth, which range from 65 to 75 percent. Once in college, these students are persisting in their studies. Specifically, of the Mi AP students who graduated high school between 2009 and 2014 who are attending college, 87 percent have

graduated or are still enrolled, and over 80 percent of the underserved students are persisting in or have graduated as of June 30th, 2016.⁴² Expanding the number of students who have access to college-level courses in high school while also supporting the students and the teachers contributes to the success of underserved students in college.

Concluding Thoughts

The need for more workers with advanced degrees and higher levels of skills is indisputable. Most of the jobs being created in the state require workers who have a college degree, and a gap still exists between the number of jobs that require a college degree and the number of workers who have a college degree. Increasing the number of workers with an education beyond high school is necessary for the state's future prosperity and is also critical to give workers and their families greater economic stability and security. While there may not be a single answer to how to meet this challenge, research points toward a proven strategy that has shown its value.

Enabling students to take rigorous coursework in high school is associated with later success in college and in the labor market. The AP program is an effective strategy to help high-school students take rigorous coursework. Through its investments, Massachusetts has expanded the AP program to reach a broader swath of students while providing adequate support for students and teachers. Massachusetts leads the nation in terms of the share of seniors earning a qualifying score on an AP exam, and Massachusetts has had the largest 10-year increase in performance on AP exams. These accomplishments occurred while the number of underserved students participating in the program also expanded significantly. The work of the

Commonwealth and its many partners shows that it is possible through a careful strategy that supports both students and teachers to increase access to the AP program to reach greater numbers of underserved students, while also maintaining the quality of the program.

The work is not done, however. More students in the Commonwealth could benefit from access to rigorous coursework. Persistent gaps remain in regard to the college readiness, college enrollment, and college success of underserved students. At the same time, there are gaps in access and performance in AP exams between students of different races and ethnicities and income levels. The efforts in Massachusetts and elsewhere offer guidance on how to effectively expand access to the AP program to a broader range of students without compromising on the quality of the program. These efforts point toward a shared responsibility between public and private sectors and between schools, teachers, and students who can work together to enable student success. The following steps are necessary to enable more students to benefit from the AP program:

- Support High Schools in Efforts to Expand Access and Improve Performance;
- Better Align AP Outcomes with College Credit Policies;
- Identify the Unmet Student Need.

Support High Schools in Efforts to Expand Access and Improve Performance

At the school level, school leaders play an important role in setting expectations for students, and they can play an active role in opening access to AP programs, rather than limiting AP courses to only "certain types of students." Schools, such as South High Community School in Worcester, (see page 16) have reaped the benefits of encouraging more

students to take AP courses. South High shows how these changes in mindset about who is AP-material can lead to a broader change in the culture of the school, where high expectations are truly embraced for all students. More generally, the experiences of successful schools show that open access to AP courses can work when access is coupled with the following ingredients: teachers who are trained and supported, a school schedule that promotes AP enrollment for everyone, a school culture focused on success for all students, and extra tutorials and interventions for students who need help.

High school leaders have a significant role to play in expanding access to AP courses, but high schools cannot do it alone. High schools need support in their expansion efforts to be able to expand and maintain a high-quality program. More teachers will be needed to teach those classes, and the teachers need professional development and support in their efforts to teach the material effectively. In addition, guidance counselors can also play a key role in advising students to take rigorous coursework, and they also need support. Finally, students need support and access to additional learning time. Policymakers can help support efforts that provide the necessary supports for teachers and students, such as teacher professional development, study sessions, and/or additional tutoring for students.

Policymakers can also help offset the fees for students to take AP exams. Currently, students pay \$94.00 for each AP exam they take. While the College Board does reduce the fee for students who qualify for free and reduced lunch, without financial support, the cost of the exam can be prohibitive. Through its Advancing STEM initiative, the Commonwealth covers the exam fees for math, science, and English exams for economically

disadvantaged students, but that is only for students who attend schools who participate in the initiative and only for some AP exams. Given the value of high school students taking rigorous coursework, financial barriers should not prevent students from taking AP exams.

Massachusetts has recently changed its district and school accountability system. The new system was approved by the Board of the Department of Elementary and Secondary Education in June 2018. It includes the percentage of 11th and 12th graders who complete advanced coursework, such as AP courses, as one indicator for high schools. School report cards will also do a better job of highlighting this measure of performance. These are important steps in recognizing the importance of rigorous coursework and providing incentives to high schools to expand their offerings.

Better Align AP Examination Outcomes with College Credit Policies

Students who earn a qualifying score on an AP exam do not consistently reap the benefits. The College Board considers scores of between 3 and 5 on the AP examination “qualifying scores” that correlate to grades of C to A in college level courses. A score of 3 usually results in the student receiving college credit for the course, but not always. There is wide variability in the awarding of college credit to students who score a 3, 4, or 5 on the AP exam, especially in Massachusetts’s public higher education system. This is confusing to students who have put in the work to earn college credit in high school and sends the wrong message to high school faculty who have prepared their students for success on the AP exam.

Across the state’s public higher education landscape,

what counts for college credit varies by institution. For example, according to the College Board, a score of 3 on the AP exam in Biology counts for credit at UMass Boston and UMass Dartmouth, but not at UMass Amherst or UMass Lowell. A student who scores a 3 on the Calculus exam will receive college credit at UMass Lowell and UMass Dartmouth, but not at UMass Amherst or UMass Boston. At Westfield State and Mass College of Art, an exam score of 4 is needed to receive college credit in Chemistry, but a student can receive credit with a score of 3 at the other seven state universities and at UMass Boston and UMass Lowell.

Legislation has been advanced that would require all Massachusetts public higher education institutions to adopt a policy that would award college credit for a score of 3, 4, or 5 on AP examinations. Twenty-three other states have adopted similar policies, encouraging hard work in high school and providing students with a clear understanding of how they can benefit from passing the AP exam. Resolving this issue should be a priority and the legislation should be signed into law.

Identify the Unmet Student Need

In order to understand the target goal, the unmet student need should be systematically identified. At a national level, it has been estimated that there are 600,000 students who are “missing” from the AP program. How many students in Massachusetts are missing and what schools do they attend? That answer will help provide a roadmap to where to devote time and resources.

There is a clear chance to expand opportunity to a broader range of students while helping the state’s economy to flourish. Massachusetts is on the right

track with its commitment to and investment in expanding access to and success in the AP program. But, the job is not done. Successful AP programs provide a roadmap for how to open access to a broader range of students and how the culture of schools can change to embrace high expectations for all students. There is a shared responsibility between the business community, policymakers, nonprofits, school leaders, teachers, and students to prepare students for success in college and the labor force. If these responsibilities are met by all, the Commonwealth will reap the rewards of a workforce that will fuel continued economic prosperity.

About The Author

Dr. Dana Ansel works as an education research and policy consultant.

She works on a range of different projects for clients, including public, private, and nonprofit organizations. Her work includes synthesizing complex bodies of research so that the findings are accessible for a broad audience. She compiled and synthesized existing research comparing the PARCC and MCAS assessment systems in order to assist the Massachusetts Board of Elementary and Secondary Education in its decision about which statewide assessment system to use. In addition, she co-authored a report that reviewed the research regarding the impact of non-cognitive skills and habits on long-term outcomes. She has also co-authored policy briefs on different research methodologies for federal Teacher Incentive Fund (TIF) grantees.

From 2000 to 2009, she was the Research Director at MassINC, a nonpartisan think tank in Boston. At MassINC, she directed all of the organization’s research projects, including reports on K-12 education, higher education, workforce development, the changing demographics of the state, and the Massachusetts economy. She is the co-author of many research reports and publications and an experienced public speaker and commentator. She has also worked with a wide range of stakeholder organizations across the state. During her time as Research Director, the Boston Globe called MassINC research “the gold standard” in the public policy arena.

Dr. Ansel earned a B.A. from Wellesley College and Ph.D. in Politics from Princeton University.

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SPOTLIGHT: WORCESTER SOUTH HIGH COMMUNITY SCHOOL: HIGH EXPECTATIONS AND A CHANGED SCHOOL CULTURE

A decade ago, South High Community School in Worcester (South High) was like most other high schools with only a select group of students participating in their AP program. Nationally, only about 12 percent of high school students who attend schools with AP courses participate in the program. Access to AP courses is often limited by formal requirements and by perceptions that AP courses are for "certain types of students." In 2005, South High began to switch the paradigm from "these kids can't" to "these kids can" by finding, recruiting, and supporting students who had been "missing" from the AP program.

South High is a large urban high school in Central Massachusetts. The student body is diverse: 44 percent are Hispanic or Latino, 17 percent are African American or Black, 32 percent are English Language Learners, and 59 percent are economically disadvantaged. Despite a student body that includes many underserved students, South High embraces an open-door policy toward AP courses.

When school leaders realized that many students were not participating in the program, Latino students in particular, who are the largest racial-ethnic group in the school, a committee was formed to figure out how to engage and support Latino students. The guidance counselor reached out to the business community, the broader Latino community, local colleges, and former Latino AP students to build a greater sense of shared responsibility for the success of Latino students. The committee—which named itself Latinos Excelling in Advanced Placement, or LEAP—included multiple stakeholders and was used as a forum to brainstorm ideas and strategies for improving AP participation.

LEAP examined the transcripts for each Latino student, looking for trends in course-taking patterns and identifying students with potential. A lack of confidence was identified as a key barrier to participation. In order to address this concern, the school added a new AP course – AP Spanish Literature. The guidance counselor encouraged

Latino students to enroll in AP Spanish and AP Spanish Literature to show students that they could succeed in AP courses. Many of these students subsequently enrolled in AP math, science, and English courses. South High offers a wide selection of AP courses, and students are exposed to academic rigor in the subjects that interest them.

Reaching out to South High's feeder middle schools was also crucial to the program's success. The guidance counselor and AP teachers met with parents and students, conducting sessions in Spanish, to increase awareness of AP courses. School leaders also visited local churches, many of them Spanish speaking, to increase awareness about the importance of AP courses among both parents of students and community members. In Worcester, the local churches helped to build the social capital that contributed to the program's success.

South High also created a separate study session for English Language Learners (ELL) interested in taking AP courses, sending an important message to ELL students: South High's faculty and staff believed that Latino students, including those identified as ELL, were expected to take AP courses. Additional strategies for cultivating a college-going culture included the launching of an annual all school AP recruiting fair, complete with signs, slogans, and activities, to promote enrollment in AP courses. This past February, more than 200 students with their parents attended the AP night, and after the event, an additional 50 students inquired about taking AP courses.

This open-door policy and a changed school culture have led to substantially more students participating in the AP program and taking more AP exams. In 2008, South High students took 186 AP exams. By 2016, that number doubled, with students taking 375 exams (102% increase). In 2017, 25 percent of students at South High participated in the AP program. During this period of expansion, the share of students earning a qualifying score has increased from 31 percent to 41 percent. During this same time, the number of AP exams taken statewide increased at roughly the same rate (108%), but the percent of qualifying scores decreased. Concerns that performance would decline if South High encouraged participation beyond a select group of

students did not materialize.

The school has successfully shed the mentality that AP courses are only for some students. The open-door policy comes with a set of expectations and a commitment from the students. Students sign a contract before enrolling in an AP course. All students are required to take the AP exam following an AP course, and students are not allowed to drop an AP course. (There are some exceptions, but it requires an in-person conversation about the request.) School leaders believe this approach helps the students build character and learn to persevere during difficult conditions. If they have a "C" in a course, they must work harder to do better, and the teachers are willing to help them to improve. Teachers stay after school to help students, and more generally, the teachers are coaches and mentors to the students, guiding them about coursework, applying to college, and career pathways. The commitment to the program often helps to redefine for the students what they can achieve, with students rising to the high expectations.

As the AP program has grown, the need for such active recruitment has decreased. The success of the program speaks for itself, and word-of-mouth helps recruit students. Teachers talk with students, and students encourage other students to take AP courses. The increased enrollment has helped to change the conversation and the culture at Worcester South to one that embraces high expectations for all students. In the words of South High's AP Coordinator, Megan Weeks, "these kids can succeed; these kids can take the most rigorous classes; these kids can achieve their dreams." The AP program is part of the school; it is not for a select group of students. Teachers have high expectations, and perhaps more important, students have high expectations for themselves.



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