

From Crisis to Opportunity:

Post-Pandemic Academic Growth in Massachusetts

By Daniel Hamlin



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Values

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Executive Summary

The significant decrease in student achievement levels following the pandemic has become a pressing national problem. In Massachusetts, the situation is equally concerning. The Commonwealth showed some of the sharpest academic achievement declines in the country in the wake of the pandemic. On the US Department of Education's National Assessment of Educational Progress, test score results for Massachusetts in 2022 dropped to levels not seen since 2003. Academic achievement levels have rebounded only slightly from declines observed after the pandemic. Based on the current rate of progress, it will take Massachusetts 10 years to return to pre-pandemic proficiency performance levels in English language arts and four years to do so in mathematics.

If these declines in academic achievement persist, there are potential social and economic ramifications. Students who exit the school system with poorer academic skills than they might have otherwise had are expected to see reduced lifelong opportunities in higher education and the workforce. The eventual cost of having a lower-skilled workforce is projected to produce an aggregate loss to the US economy of \$28 trillion. Economic losses could be substantial in Massachusetts where the financial return to academic skills is higher than that of many other states.

To assist schools in recovering from the pandemic, the federal government allocated three waves of funding through its Elementary and Secondary School Emergency Relief (ESSER) package. Massachusetts received over \$2.9 billion in ESSER funding that districts have largely allocated for academic remediation programs, such as high-dosage tutoring, summer learning programs, and after-school remedial instruction. This paper reviews these short-term learning loss recovery interventions. Evidence from this review indicates that while these popular learning loss interventions are underpinned by a strong research base, they are difficult to extend to all students and may be unsustainable after one-time federal relief funding is exhausted. An emphasis on sustainable, long-term strategies may be needed to accelerate student learning beyond the pandemic.

To consider long-run policy responses, this paper examines differentiated teacher compensation, permanently extended instructional time, family engagement programs, and college, career, and technical education initiatives as potential strategies for sustaining student success in Massachusetts. Research suggests that if well-designed, these approaches hold promise for not only supporting learning loss recovery efforts but also creating a foundation for continued academic growth over the long run.

Background

The COVID-19 pandemic led to historic closures of the United States' public schools in spring of 2020¹. In Massachusetts, Governor Charlie Baker issued an executive order in mid-March of 2020 that closed all schools for in-person instruction until the following academic year². K–12 schools made an abrupt shift to remote instruction in the early days of the pandemic, but this transition was tumultuous³. In many cases, schools struggled to deliver effective virtual education with teachers often being inadequately prepared for online teaching. Students and their families also struggled to adapt to unfamiliar remote learning platforms and routines⁴. During the 2020 transition to remote learning, approximately 68 percent of Massachusetts' educators reported having no experience teaching remotely⁵.

Students encountered other difficulties. A number of low-income families in urban and rural areas lacked appropriate devices or the reliable Internet connections necessary for fully remote schooling. According to the US Department of Education, approximately one-in-ten US students in the lowest income quartile lacked home Internet access of any kind (including through smart phones) although some districts attempted to address this gap during the pandemic by providing computers and Internet access to large numbers of low-income households⁶.

The Commonwealth showed some of the sharpest academic achievement declines in the country in the wake of the pandemic.

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Even with appropriate tools in place to deliver remote instruction, distractions at home, lack of face-to-face interaction, and unfamiliarity with online learning routines contributed to low student engagement during the twists and turns of the pandemic. The mental and socioemotional toll on students was also severe, with considerable rises in anxiety, depression, and suicide among youth⁷. At the height of the pandemic, approximately one in four students reported elevated levels of depression, worry, and anxiety in a nationally representative survey of over 3,000 youth (ages 13–19)⁸.

By fall of 2020, some schools reopened for in-person instruction, but 68 percent of schools nationwide remained fully remote or used hybrid models⁹. At the start of the 2020–21 academic year, the Massachusetts Department of Elementary and Secondary Education announced that most of the Commonwealth’s schools were operating using virtual or hybrid learning as opposed to full-time in-person instruction. It was not until the end of the school year in mid-May of 2021 that Massachusetts Commissioner of Elementary and Secondary Education Jeffrey Riley moved to require all public schools to provide full-time in-person instruction. At the time, slightly more than half of all American students were attending public schools providing full-time in-person instruction¹⁰.

Table 1. Timeline: COVID-19 responses in Massachusetts and assessment schedules

Spring, 2020	<ul style="list-style-type: none"> ▪ School closures for in-person instruction and a shift to remote learning ▪ Annual assessments canceled
Fall, 2020	<ul style="list-style-type: none"> ▪ Some schools reopen for in-person learning while many remain fully remote or rely on hybrid models
Spring, 2021	<ul style="list-style-type: none"> ▪ Annual assessments resume with modifications and test date delays
Fall, 2021	<ul style="list-style-type: none"> ▪ Most schools make a full transition to in-person instruction
Spring, 2022	<ul style="list-style-type: none"> ▪ Annual assessments administered on regular schedule

The Extent of Learning Loss

During the 2021–22 school year, as schools returned to in-person instruction, state and national assessments that had been canceled the previous spring resumed. These assessments showed glaring declines in student learning, which have been found not only in the United States but also in many other countries. A recent meta-analysis of 42 studies found substantial post-pandemic learning loss in examining student outcomes in 15 countries¹¹.

In the United States, the National Assessment of Educational Progress (NAEP), often referred to as the Nation’s Report Card, is considered a rigorous benchmark for measuring student achievement in mathematics and reading¹². This assessment takes representative samples of fourth grade (9-year-old students) and eighth grade (13-year-old students) students in all 50 states, usually every two years. When comparing the scores of students tested prior to the pandemic to the scores of students tested in 2022, there were steep declines in student learning. Among fourth grade students, decreases in reading and mathematics scores in 2022 erased approximately twenty years of progress¹³. For eighth grade students, results were worse, with average mathematics and reading scores plummeting to levels not seen on the NAEP since 1990¹⁴. Analyses of state tests exhibited similar trends. On state assessments, students in grades 3–8 lost approximately half a grade-level in math and one-third of a grade-level in English language arts¹⁵.

Average test score declines also conceal differences in learning loss between low-achieving and high-achieving students, as well as low-income students and their more affluent peers. On the NAEP, students at the 25th percentile showed greater test score declines than their higher achieving peers¹⁶. Low-income students eligible for free-and-reduced price lunch generally had larger declines in test scores than students not eligible for the free-and-reduced lunch. The children of less educated parents experienced disproportionately greater drops in their test scores when

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compared to students from households of college educated parents. On the whole, disruptions to learning during the COVID-19 pandemic seem to have widened academic achievement gaps¹⁷.

Nationally, researchers have found little correlation between pre-pandemic state achievement levels and learning loss. Both low and high scoring states recorded similarly large learning losses coming off the pandemic. Use of remote instruction, in part, appears to have exacerbated achievement gaps by race and family income, according to rigorous analyses of over two million test scores in 49 states¹⁸. Moreover, it was high-poverty schools that tended to rely on remote instruction most.

Learning Loss in Massachusetts

Prior to the pandemic, Massachusetts consistently ranked as one of the top-scoring states, and in the wake of the pandemic, its students still achieve at levels that are among the highest in the nation. Nevertheless, test data demonstrate that Massachusetts’ scores were sliding on the NAEP before the pandemic while the Commonwealth’s pandemic-era learning declines were among the sharpest in the country. On the US Department of Education’s National Assessment for Educational Progress, Massachusetts math scores for fourth graders fell to where they were in 2003, while reading scores were well below 2000 levels (See Figure 1). In Figure 2, eighth grade trends are similar. Reading scores dropped below where they were in 2003 as did test scores in mathematics.

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Figure 1. NAEP Long-term trends in reading and math (Grade 4, Massachusetts)

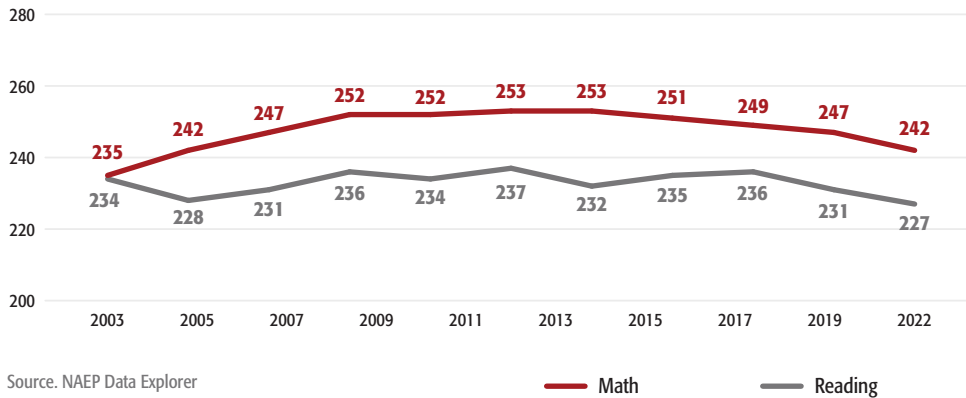
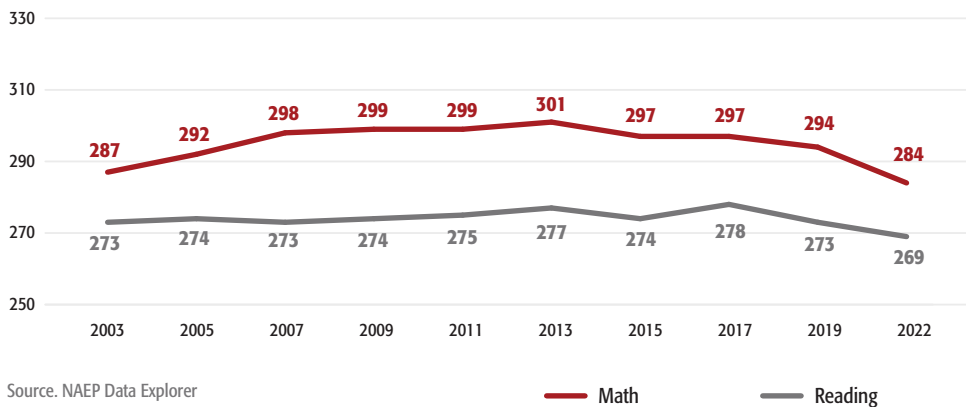


Figure 2. NAEP Long-term trends in reading and math (Grade 8, Massachusetts)



An uneven and slow recovery

Researchers have described numerous academic, social-psychological, and health reasons for the pandemic-era decrease in academic performance. Foremost among them was that students experienced an unprecedented disruption to regular learning that resulted in a loss of substantial instructional time. Hybrid and remote models that took the place of in-person instruction for extended periods offered less instructional time. These alternative models were found to be poor substitutes, being characterized by poor student experiences, student disengagement, and technological problems¹⁹. When schools reopened for in-person learning, reports of student absenteeism, fights and conflicts, and general socioemotional distress in schools skyrocketed. This environment likely hindered educators' immediate efforts to work toward recovering from learning loss incurred during the pandemic.

National studies generally show that the academic recovery has been slow and uneven. In an analysis of 21 states, Halloran and colleagues reported a 20 percent recovery in English language arts and 37 percent recovery in math on 2022 state assessments²⁰. For the 2023 assessment, Lewis and Kuhfield performed a longitudinal analysis of the test scores of 6.7 million students attending over 20,000 schools²¹. They found that the average student would need to make up 4.1 months of additional instruction in reading and 4.5 months of additional instruction in mathematics to return to pre-pandemic achievement levels in these subjects.

At the district level, researchers have observed a slight recovery in average school district achievement. For example, Fahle and colleagues (2024) found that districts recovered approximately one-third of the original loss in mathematics (0.17 grade levels) and one-quarter of learning loss in reading (0.08 grade levels) on 30 state assessments in 2023²². These improvements correspond to 117 percent of typical academic growth in math and 108 percent in reading for a single academic year.

These aggregated results obscure wide variation in recovery rates across US states. Iowa, Mississippi, South Carolina, and Tennessee have made a full recovery from initial learning losses in reading while Arkansas, Delaware, Minnesota, and Nevada have even lost ground over the same period²³. It is not entirely clear why some states have fared well in the post-pandemic era and others have not.

Massachusetts has only made limited progress. On the Commonwealth's main assessment, the Massachusetts Comprehensive Assessment System, test scores have remained far below where they were prior to the pandemic. In Table 2, academic proficiency levels in Grades 3–8 plummeted by 16 percentage points between the 2019 and 2021 assessments while proficiency levels in English language arts in Grades 3–8 dropped by only 6 percentage points over the same period but continued to decline by an additional five percent in the following year in 2022 (see Table 2 below). Between the 2022 and 2023 assessments, proficiency growth was only 1 percent in English language arts and 2 percent in math. At these rates, it will take the Commonwealth 10 years to return to pre-pandemic proficiency achievement levels in English language arts and four years to do so in mathematics. Academic growth is occurring at a faster pace in mathematics than in English language arts though there was more lost ground to be recovered in mathematics. The slow recovery in Massachusetts seems to be affecting students similarly with low-income students and students of different racial/ethnic backgrounds recovering at a mostly similar pace according to data from the Massachusetts Department of Elementary and Secondary Education.

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Table 2. The Percentage of Students Meeting Expectations or Higher in English Language Arts and Mathematics on the Massachusetts Comprehensive Assessment System

	2018	2019	2020	2021	2022	2023	2021–2023 % Change
English language arts							
G3–8	51	52	-	46	41	42	-4
Grade 3	52	56	-	51	44	44	-7
Grade 4	53	52	-	49	38	40	-9
Grade 5	54	52	-	47	41	44	-3
Grade 6	51	53	-	47	41	42	-5
Grade 7	46	48	-	43	41	40	-3
Grade 8	51	52	-	41	42	44	3
Math							
G3–8	48	49	-	33	39	41	8
Grade 3	50	49	-	33	41	41	8
Grade 4	48	50	-	33	42	45	12
Grade 5	46	48	-	33	36	41	8
Grade 6	47	52	-	33	42	41	8
Grade 7	46	48	-	35	37	38	3
Grade 8	50	46	-	32	36	38	6

Source. Massachusetts Department of Elementary and Secondary Education²⁴. In 2020, MDESE assessments were canceled.

There are different theories about why performance has not returned to pre-pandemic levels. Recent evidence suggests that students and teachers are struggling with mental health and social problems that are hindering academic progress. According to 2021 data from the Centers for Disease Control, 37 percent of high school students reported poor mental health during the pandemic, and 55 percent reported experiencing emotional abuse by a parent or other adult in the home, including swearing at, insulting, or putting down the student. Eleven percent experienced physical abuse by a parent or other adult in the home²⁵. A meta-analysis indicated a rise in anxiety and depression after the pandemic²⁶. The Centers for Disease Control and Prevention (CDC) reported that emergency room visits for suicide attempts among girls aged 12–17 were over 50 percent higher in the spring of 2021 compared to the same time in 2019²⁷. As students returned to in-person school, it may be unsurprising then that rates of fighting, violence, and bullying rose while chronic absenteeism reached record levels. Teachers also left the profession at high rates with job-related stress being cited as one of the reasons for these departures²⁸.

The cost of achievement declines

Learning loss during the COVID-19 pandemic was steep and recovery to pre-pandemic achievement levels has been slow and inadequate. Unfortunately, poor achievement in mathematics and reading in elementary and middle school can reduce opportunities for advanced coursework in high school that provide the foundation for students to pursue high-earning college majors in health, science, and technology²⁹. Low academic performance is also likely to have a cascading effect that continues into adulthood—student achievement is consistently associated with income, employment, and even incarceration in later life³⁰. Some scholars have argued that remediation alone will not compensate for learning losses and that returning to previous achievement levels will leave low-achieving students who exit the system with a permanent disadvantage in the labor market³¹.

The consequences of low achievement could also diminish the potential for the education system to serve as an equalizer of economic and social opportunities³². The World Bank has forecasted a loss of \$17 trillion in lifetime earnings for current students if learning deficits are left unaddressed³³. In the United States, some projections suggest a 6 percent decline in lifetime income for

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unremediated learning loss. In one analysis, the economic cost of having a lower-skilled workforce as a result of pandemic-era learning loss is thought to be \$28 trillion in present value³⁴. In Massachusetts, where the financial return on academic skills is generally high relative to other states, students in the Commonwealth are projected to have their lifetime earnings drop by nearly 8 percent, compared with 6 percent nationally. Economists have likened these losses to a permanent tax on students over their lifetimes.

Responding to Learning Loss

Aggressive measures are arguably needed to accelerate academic growth in the K–12 education system. A student who has lost a year of learning would need to see growth of 125 percent per year for four years to compensate for ground lost during the pandemic. Scholars and policymakers alike have called for widespread use of high-leverage academic interventions to recoup learning loss³⁵. The federal government has provided support for some of these efforts through its Elementary and Secondary School Emergency Relief (ESSER) funds. These funds were allocated in three waves under the Coronavirus Aid, Relief, and Economic Security (CARES) Act, the Coronavirus Response and Relief Supplemental Appropriations (CRRSA) Act, and the American Rescue Plan (ARP) Act³⁶.

The three waves of ESSER funding amounted to \$190 billion in school aid. The first wave emphasized funding for responding to COVID-19 as schools reopened, whereas the second and third waves of funding explicitly sought to address learning loss³⁷. The third wave mandates schools to reserve at least 20 percent of ESSER funds to implement learning loss interventions, highlighting academic interventions, such as high-dosage tutoring, summer learning, and after-school academic programs (US Department of Education, 2021).

In Massachusetts, schools received more than \$2.9 billion in ESSER aid. Table 3 presents the amounts allocated to school districts over the three rounds of funding. Most districts prioritized investments that targeted student achievement. In a study of 17 Massachusetts districts, approximately half of ESSER funding was allocated to smaller class sizes, high dosage tutoring, specialized online coursework, professional development, and instructional staff for high-priority subjects. During the third wave of ESSER funding, 46 percent of funds were distributed for these same purposes. Districts also used ESSER funds for socio-economic support systems, family and community partnerships, and school facilities.

Table 3. Use of ESSER funds allocated with school districts in Massachusetts³⁸

	Allocated	Claimed	Deadline to Spend
ESSER I	194.4	194.4	Sept. 30, 2022
ESSER II	738.9	737.7	Sept. 30, 2023
ESSER III	1,658.6	990.4	Sept. 30, 2024

High Leverage Interventions For Learning Loss Recovery

Districts have emphasized high-leverage interventions that are backed by research demonstrating measurable effects on student achievement. Many of these interventions are considered “high-leverage” because they are specifically designed to accelerate rapidly the academic performance of students who are struggling or at risk of grade failure. High dosage tutoring and summer learning are two of the most popular high-leverage academic interventions supported by federal funding. For example, in their ESSER plans, 40 percent of school districts intended to offer high dosage tutoring while 60 percent sought to provide summer learning and after-school instructional programs³⁹.

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High-dosage tutoring

As one of the most popular programs to accelerate student learning, high-dosage tutoring consists of intensive small group instruction where one well-trained tutor works with one to four students over at least a 10-week period⁴⁰. Each tutoring session occurs at least three times per week (usually within the school day) and is typically 30 to 60 minutes in duration⁴¹. The increased frequency and duration of instruction differentiate high-dosage tutoring from standard forms of tutoring.

Thirty-seven states proposed high-dosage tutoring programs in their ESSER plans⁴². In 2022, the US Department of Education reported that approximately 37 percent of the nation's schools were offering high-dosage tutoring⁴³. In Massachusetts, the Department of Elementary and Secondary Education (DESE) allocated funding for districts to partner with vendors at no cost for high-dosage tutoring programs in mathematics for grades 4 and 8 and in reading for kindergarten through grade 3. Approved vendors deliver high-dosage tutoring in a range of formats, including 1:1 in-person tutoring delivered within the school day and through virtual tutoring⁴⁴.

Rigorous research evaluations of in-person high-dosage tutoring programs have demonstrated strong gains in mathematics and reading achievement, attendance, and other social and life outcomes among academically underperforming students. In a meta-analysis of 96 randomized controlled trials, researchers calculated an overall pooled effect size of 0.37 standard deviations for high dosage tutoring programs, which amounts to approximately one year of learning⁴⁵. High dosage tutoring is also effective “without reservations” based on the US Department of Education's What Works Clearinghouse standards so it has a highly credible evidence base backing its use as an academic remediation strategy for struggling students.

Even though ESSER funding has extended high-dosage tutoring programs to school districts, a key drawback of high-quality, in-person, high-dosage tutoring is that it is difficult to sustain because of its high per-pupil cost. In one influential analysis of students in Chicago, researchers found large achievement effects ranging from 0.18–0.40 standard deviations for one hour of 2:1 tutoring per day for the entire academic year, but the cost of this program was \$3,200–4,800 per student each year⁴⁶. There are additional logistical and training constraints that can limit the reach of high dosage tutoring programs. In small towns and rural areas, in particular, recruiting tutors to travel beyond a 30–40-minute radius is challenging because of travel time and gas expenses. Distance is thus a substantial logistical barrier to broad and sustained scalability of high-quality tutoring programs. Virtual models that might extend the reach of high dosage tutoring have had much smaller academic gains compared to in-person models.

Summer Learning Programs

In 2022, approximately 90 percent of school districts offered summer learning programs⁴⁷. These programs are designed to deliver increased instructional time and are commonly paired with student enrichment activities. One of the main rationales for summer learning programs is the belief that low-income students are less likely than their middle- and high-income peers to have access to enrichment and learning opportunities during the summer months. Some scholars contend that low-income students thus lose academic skills and knowledge over the summer, leading to a widening of achievement gaps at the start of each school year⁴⁸. Summer learning programs are not only meant to counteract this so-called “summer slide” but also to accelerate student achievement for those in need of support.

According to analysis done by Rand Corporation, effective summer learning programs should be five to six weeks in duration and include at least 60–90 minutes of instruction each day. To be effective, these programs need to be staffed by talented teachers who have received professional development on how to deliver summer learning programs⁴⁹. In research reviews, summer learning programs have exhibited moderate positive effects on achievement⁵⁰. A recent meta-analysis of 37 evaluations of summer learning programs reported an overall effect size of .10 standard

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deviations for mathematics and 0.09 standard deviations for behavioral and social emotional outcomes⁵¹. Additionally, a meta-analysis of 41 summer learning programs targeting low-income students in grades kindergarten to eighth grade reported an overall gain of 0.10 standard deviations in reading⁵².

Summer learning programs have the potential to generate modest improvements in student achievement⁵³. Still, these programs tend to be voluntary, so a common criticism is that they do not always reach students who need them most. Another critique is that attendance in these programs is often sporadic, leading to participants not reaping the full benefits of summer learning programs. The programs are, however, less expensive than high dosage tutoring. The National Summer Learning Association estimates the cost of a six-week program to be nearly \$1,800 per student⁵⁴.

After-school Learning

Districts have also established after-school programs focused on addressing learning loss by increasing instructional time. Approximately 65 percent of districts receiving ESSER funding articulated plans to use ESSER funds for after-school programs with most of these programs emphasizing academic supports⁵⁵. According to the US Department of Education 87 percent of public schools offered after-school programs with 67 percent of these programs making academics the primary focus. Nonetheless, it is estimated that only 13 percent of students took advantage of these programs though nearly all of these programs (92 percent) were provided at no cost to families. Unlike summer learning and high-dosage tutoring programs, the results of after-school academic programs are inconsistent⁵⁶.

Long-Term Policy Responses

The emphasis on high leverage instructional strategies coming off the pandemic may contribute to reducing learning loss. Yet, programs of this nature tend to be supported by one-time (or limited) funding sources that may be difficult to sustain after funds are exhausted. It is also the case that many recovery-oriented interventions are optional and may not reach students most in need of remediation⁵⁷. For instance, although 78 percent of school districts offered summer learning programs in 2023, only about 15 percent of students participated in them despite 90 percent of these programs operating at no cost to families⁵⁸. While high-dosage tutoring and summer learning programs can be significant academic supplements, some observers are calling for states to set forth long-term approaches that can not only remediate learning loss for all students but also create a foundation to sustain academic growth into the future.

Differentiated compensation for teachers

Attracting and retaining effective teachers is likely to be a critical long-term strategy for school systems. Among the many school-based inputs for which financial resources are allocated, it is classroom teachers who consistently have significant positive effects on student outcomes⁵⁹. Moreover, the influence of an effective teacher extends into adulthood, leading to higher college attendance rates, increased income and employment, and lower levels of incarceration in later life⁶⁰. Effective classroom teachers can help to create a stable foundation in schools that affects the learning of every student within the school day, but a growing number of districts are struggling to recruit and retain quality teachers⁶¹. Nearly every state has schools with unfilled teaching positions in mathematics and science⁶². In Massachusetts, teacher recruitment and retention difficulties are greatest in high-poverty districts that may be most in need of effective teachers.

Compensation plans represent one strategy being used to address this problem. While researchers have found that teachers are partly motivated by the intrinsic rewards of the profession, compensation seems to be a highly important factor for educators⁶³. Teacher compensation is somewhat satisfactory in Massachusetts when compared to other states⁶⁴. Massachusetts ranked 15th among

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states for starting salaries (cost of living adjusted) according to a recent state-by-state analysis. To attract and retain teachers where they are needed most, the Commonwealth may need to test new approaches.

Differentiated compensation for teachers who work in high needs schools or subject areas is a policy option that states and localities are increasingly pursuing. Massachusetts currently offers little opportunity for differentiated compensation that might incentivize high-performing teachers to work in high needs schools or in high-demand subject areas. One misconception about offering differentiated pay is that teachers themselves oppose it. However, in national polls, teachers generally express support for differentiated pay systems⁶⁵.

Outside of Massachusetts, school districts in Dallas, Newark, and Washington DC are combining differentiated pay with performance pay, which tends to be more contentious than a differentiated pay system alone. Based on existing studies, the overall body of evidence suggests that when performance incentives are sufficiently large, they can produce positive results. Leading teacher evaluation scholars estimate that incentives of about 25 percent of a teacher's salary might neutralize the effects of turnover in difficult-to-staff schools. Performance bonuses could also help with staffing needs. One of the oldest performance-pay systems in the nation reported improvements in teacher retention from bonuses amounting to 10–20 percent of a teacher's salary. In a rigorous study of 80 high needs schools in Tennessee, results showed that bonuses of \$5,000 led to higher rates of retention among teachers. Massachusetts districts may need to begin piloting new pay plans to identify teacher compensation strategies that are sustainable and meet teaching needs.

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Permanently extended instructional time

In tandem with strengthening the teacher workforce, increased instructional time can help to accelerate academic growth over the long run⁶⁶. Massachusetts follows a standard 180-day school year with 900 mandated hours for students in grades 1 to 5 and 990 required hours for students in grades 6 to 12⁶⁷. In the post-pandemic era, states and localities have moved to increase instructional days permanently, but it is important to note that simply raising time spent in schools may prove insufficient unless the additional time is concentrated on high-quality instruction⁶⁸. A 2024 meta-analysis is insightful in this respect. Researchers analyzed 74 causal studies and found that merely increasing instructional time is associated with a wide range of small to medium effects on achievement⁶⁹. To capitalize on extended instructional time, schools should set forth a clear vision for how to leverage instructional time to enhance learning, especially to assist underperforming students. There is evidence that such deliberate strategies are beneficial. In Massachusetts, researchers have found that increased instructional time produces higher student achievement in the Commonwealth's high-performing charter schools⁷⁰.

College, career and technical education opportunities

Another critical long-term initiative that states are investing in is the modernization of college, career, and technical education. In 2017, Massachusetts initiated its High Quality College and Career Pathways program⁷¹. The program aims to help high school students develop an understanding of their interests and strengths while assisting them in making smooth transitions to post-secondary education or the workforce. The program encourages districts to cultivate opportunities through four types of experiences:

- **Career and Technical Education** offers at least 900 hours of immersive learning, collaborative work experience and education with local employers, and “high-value” credentials. Eleven clusters constitute 45 programs, including information technology, engineering, agriculture, health services, and other high-demand careers.
- **Career Connections** seeks to impart extensive knowledge of a specific field or industry. To do so, students take 2–3 focused courses that build on one another in a single area. Students also participate in work-based learning experiences in this field.

- **Innovation Career Pathways** provides a minimum of a 100-hour internship or work-based learning experience in high-demand fields (e.g., health sciences, finance, life sciences, and engineering). Students complete two advanced courses (e.g., advanced placement, international baccalaureate or dual enrollment) as part of this pathway.
- **Early College** enables students to earn a minimum of 12 college credits. Approximately 8,000 students participated in this program during the 2023–24 school year.

High Quality College and Career Pathways programs have the potential to offer in-depth college and career experiences that can facilitate smooth transitions into high-paying careers or post-secondary education. Dual enrollment programs that allow students to earn college credit during high school may help to overcome obstacles that students face by reducing time, cost, and academic barriers to higher education.

Additionally, Massachusetts' programs tend to stress depth. In national data, researchers have found that in-depth career and technical education experiences have greater economic returns than those that are broad in nature⁷². In Massachusetts, there are indications of success. The vast majority of students participating in the Commonwealth's career and technical education programs received a positive placement (i.e., post-secondary education or employment) upon graduation according to Massachusetts Department of Elementary and Secondary Education reports. If Massachusetts' college, career, and technical education programs enhance higher education and labor market outcomes for students, these programs can conceivably compensate for pandemic-era learning losses that are estimated to reduce students' post-secondary education and income⁷³.

Still, opportunities are limited in some districts. For example, only about one in five students participated in career and technical education during high school. Analyses of these programs have found that there is great interest in these programs and considerable excess demand that is not being met across the Commonwealth⁷⁴. To advance student success over the long-term, Massachusetts likely needs a strategy for extending college, career, and technical educational offerings, especially in high-demand areas of the health sciences, technology, and engineering.

Family engagement in student learning

Policies promoting family engagement in student learning are an area that some scholars argue is crucial to academic recovery efforts as well as the long-term vitality of school systems⁷⁵. In one recent case study, researchers reported that family engagement was associated with strong post-pandemic achievement growth⁷⁶. For decades, scholarly research has shown links between family involvement in education and children's academic, socio-emotional, behavioral, and life outcomes⁷⁷. Importantly, these positive associations hold for families of different socioeconomic and racial/ethnic backgrounds⁷⁸.

With input from families, family engagement policy should be tailored because the nature and function of family involvement may take shape differently depending on school contexts and grade levels served. During elementary school years, parent-child shared reading programs, parenting programs, and structured homework help show consistent positive results. Parent-child reading interventions, in particular, have exhibited strong causal effects for children during elementary school in randomized controlled trials⁷⁹. As children mature though, the literature indicates that more subtle forms of family involvement, such as parental monitoring, academic socialization, and high expectations for learning, grow in importance. Other school-based forms of parental involvement (e.g., volunteering in school) may foster conditions in schools that optimize learning even if they do not influence academic outcomes directly⁸⁰. School safety, school climate, and perceived school quality are positively associated with school-based forms of parental involvement in low-income urban schools⁸¹.

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Despite the potential benefits of family involvement, researchers report that low-income families often face barriers to participating in their children’s education⁸². At the same time, parents say that they want to participate in the academic development of their children but often report needing more direction from schools on how to support their children’s academic development. Parent-child instructional and reading strategies, parent-child communication about academics, and parenting practices rank among the most commonly cited areas of guidance desired by families⁸³. To assist parents in promoting children’s learning and development, districts can expand programs offering guidance in these areas. Massachusetts families are arguably well positioned to assist with children’s learning. Approximately 47 percent of residents hold a bachelor’s degree — the highest percentage in the United States⁸⁴. For families with less formal education, cultivating trusting relationships with parent/caregivers and creating flexible programming may be key to leveraging the efforts of all families to drive student growth.

Conclusion

Massachusetts’ students have consistently led the nation in academic performance (see Appendix Table 1A for current rankings). Its students have routinely compared well with students in top performing nations (e.g., Finland, South Korea, and Japan) on international assessments. In spite of this strong past academic performance, learning loss during the pandemic coupled with a slow recovery for the Commonwealth’s students is cause for some concern. Economist Eric Hanushek argues that millions of students will be left with a permanent economic disadvantage if learning loss is not addressed before students exit the school system⁸⁵.

The federal government’s Elementary and Secondary School Emergency Relief (ESSER) package funded learning recovery programs (e.g., high-dosage tutoring and summer learning) in Massachusetts, but these opt-in programs are difficult to extend to all students and may be unsustainable after one-time federal relief funding is exhausted. Even if funding sources can be identified to maintain these programs, the Commonwealth may need other enduring strategies that can reach all students within the school day to not only address pandemic-era learning loss but also ensure student success into the future. Differentiated teacher compensation, increased instructional time, expanded college, career, and technical education, and strengthened family engagement in student learning represent some of these promising long-run strategies that are gaining renewed emphasis in some states and localities. Research indicates that if well designed, these approaches could enable sustained academic growth and create the conditions for success for students in need of academic support in Massachusetts.

Massachusetts’ students have consistently led the nation in academic performance (see Appendix Table 1A for current rankings). Its students have routinely compared well with students in top performing nations (e.g., Finland, South Korea, and Japan) on international assessments.

Appendix

Table 1A. NAEP 2022 results

State	Math (Grade 4)	State	Math (Grade 8)	State	Reading (Grade 4)	State	Reading (Grade 8)
Wyoming	243	Massachusetts	284	Massachusetts	227	New Jersey	270
Massachusetts	242	Idaho	282	Florida	225	Massachusetts	269
Nebraska	242	Utah	282	Wyoming	225	Utah	265
Florida	241	New Jersey	281	Colorado	223	Connecticut	264
Iowa	240	South Dakota	281	New Hampshire	223	Idaho	264
North Dakota	240	Wisconsin	281	New Jersey	223	Vermont	264
Utah	240	Wyoming	281	Utah	221	Colorado	263
Wisconsin	240	Minnesota	280	Connecticut	219	New Hampshire	263
Indiana	239	Indiana	279	Hawaii	219	Illinois	262
Minnesota	239	Nebraska	279	Montana	219	New York	262
Montana	239	New Hampshire	279	Nebraska	219	Ohio	262
New Hampshire	239	Virginia	279	Ohio	219	South Dakota	262
New Jersey	239	North Dakota	278	Pennsylvania	219	Washington	262
South Dakota	239	Iowa	277	Illinois	218	Wisconsin	262
Texas	239	Montana	277	Iowa	218	Indiana	261
Ohio	238	Connecticut	276	North Dakota	218	Montana	261
Pennsylvania	238	Ohio	276	South Dakota	218	Wyoming	261
Hawaii	237	Vermont	276	Indiana	217	Florida	260
Illinois	237	Washington	276	Kentucky	217	Georgia	260
Colorado	236	Colorado	275	Mississippi	217	Iowa	260
Connecticut	236	Illinois	275	Rhode Island	217	Minnesota	260
Idaho	236	New York	274	Vermont	217	Virginia	260
North Carolina	236	North Carolina	274	Washington	217	Arizona	259
Tennessee	236	Pennsylvania	274	Wisconsin	217	California	259
Virginia	236	Maine	273	Georgia	216	Hawaii	259
Georgia	235	Michigan	273	North Carolina	216	Maryland	259
Kansas	235	Texas	273	South Carolina	216	Michigan	259
Washington	235	Kansas	272	Arizona	215	Nebraska	259
Kentucky	234	Missouri	272	Idaho	215	Nevada	259
Mississippi	234	Tennessee	272	Kansas	215	Pennsylvania	259
Rhode Island	234	Arizona	271	Minnesota	215	Rhode Island	259
South Carolina	234	Florida	271	California	214	Kentucky	258
Vermont	234	Georgia	271	New York	214	Missouri	258
Maine	233	Alaska	270	Tennessee	214	North Dakota	258
Arizona	232	California	270	Texas	214	Tennessee	258
Michigan	232	Hawaii	270	Virginia	214	Louisiana	257
Missouri	232	Oregon	270	Alabama	213	Maine	257
Alabama	230	Rhode Island	270	Maine	213	Oregon	257
California	230	Kentucky	269	Missouri	213	Kansas	256
Louisiana	229	Maryland	269	Arkansas	212	North Carolina	256
Maryland	229	Nevada	269	Louisiana	212	Arkansas	255
Nevada	229	South Carolina	269	Maryland	212	Texas	255

Oklahoma	229	Arkansas	267	Michigan	212	South Carolina	254
Arkansas	228	Louisiana	266	Nevada	212	Alaska	253
Oregon	228	Mississippi	266	Oregon	210	Delaware	253
New York	227	Alabama	264	Delaware	208	Mississippi	253
Alaska	226	Delaware	264	Oklahoma	208	Alabama	251
Delaware	226	Oklahoma	264	District of Columbia	207	Oklahoma	251
West Virginia	226	District of Columbia	260	West Virginia	205	District of Columbia	250
District of Columbia	223	West Virginia	260	Alaska	204	West Virginia	249
New Mexico	221	New Mexico	259	New Mexico	202	New Mexico	248

Source: NAEP Data Explore.

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About the Authors

Daniel Hamlin is an associate professor in the Department of Educational Leadership and Policy Studies at the University of Oklahoma. In his research, Hamlin focuses on the effects of education policies related to academic achievement, student health and safety, parental involvement, school climate, and school choice. Hamlin's work appears in peer-reviewed journals, including the *American Educational Research Journal*, *Sociology of Education*, the *Journal of Criminal Justice*, *Educational Policy*, and *Urban Education*. His research has also been covered in the *Wall Street Journal*, *NPR*, *Forbes*, *Marginal Revolution*, *The 74*, and *Chalkbeat*.

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