

The Schools Our Students Deserve



A Roadmap for Rethinking Education

WINTER 2025



Condition
of Education
IN THE COMMONWEALTH

Introduction

What is the purpose of school? Modern scholarship often cites a few common functions of public education: preparing individuals for participation in a democratic society, imparting a shared foundation of knowledge, and fostering social mobility by equipping students with career-ready skills.¹ But ask students—particularly those who have been historically marginalized by an education system not designed for their success—and you might get a different answer. As one young person told the Rennie Center, “School doesn’t prepare you for [a] career. It prepares you to become the teacher.”²

Despite this disconnect, discussions of education policy rarely engage with foundational questions about the purpose of schooling. Even more rarely do policymakers and practitioners take a step back and consider whether the structure of schools is designed to achieve their intended purpose. Our understanding of schools is deeply rooted in mythologies accumulated over generations. Many of these are grounded in law and policy, such as budgets, educator licensure, learning standards, and accountability. But many others are simply part of the story we tell ourselves about what schools are and should be, and there is little basis for these practices other than a shared narrative—for instance, how classes are arranged within school buildings, how staff are assigned to work with students, the way that students move through course content and across grade levels defined by age. None of these are necessary or fundamental to achieving the purposes of school. In other words, many of the fundamental structures that define modern schools have been built up as much by tradition as by intention.



PHOTO: Ignite Reading

The origin of these practices would not matter so much if they produced positive outcomes for all students, but we know that is not the case.³ Instead, the rigid structures that have come to define the school day are better equipped at shuffling students forward through content and grade levels than they are at ensuring each student receives the support they need to succeed. Moreover, while the “one-size-fits-all” nature of education affects nearly all students, regardless of identity or socioeconomic status, the negative impact is not evenly distributed.⁴ Wealthy parents are able to closely monitor their children’s learning and intervene where needed, such as through private tutoring and pricey extracurricular activities.⁵ However, the same is not true for many others, including families experiencing poverty, newly arrived migrants, or individuals for whom the school system has been a source of trauma. For these students and families, the way that schools are organized does not just restrict progress—it often actively contributes to feelings of disempowerment and alienation.⁶

A quick look at the data reveals far too many students are struggling to find purpose and value in their education. In 2020, before the pandemic, the Yale Center for Emotional Intelligence reported that 75% of students felt negatively about school—50% were tired, 70% bored, and 80% stressed.⁷ These struggles were only intensified by the COVID-19 pandemic. According to the EdWeek Research Center, over 80% of educators reported students’ motivation and engagement declined post-pandemic, a perception borne out by student behaviors.⁸ Nationwide, chronic absenteeism rose by 13.5 percentage points from 2019 to 2022, while Massachusetts saw an even sharper increase of 14.8 percentage points during this same period.^{9,10} Given these trends, it is not surprising that only 11% of Massachusetts eighth-grade students and 15% of tenth-grade students have a favorable or most favorable view of their school, according to the 2024 Massachusetts Voices on Climate and Learning Survey.¹¹

It is clear that schools are struggling to make their case to students. As technology radically transforms how we work, communicate, and solve problems, classrooms feel cut off from the dynamic, interconnected, fast-changing world just beyond their walls. A growing body of research in fields ranging from cognitive psychology to neuroscience to education theory points to a large divide between how schools operate and how students learn.¹² Effective learning is about more than the

THE PROJECT

The Condition of Education in the Commonwealth project is one way the Rennie Center for Education Research & Policy advances its mission of improving public education through well-informed decision-making based on deep knowledge and evidence of effective policymaking and practice. It takes a yearly snapshot of the education system in Massachusetts, examining broader patterns in our public schools and recommending areas for action that are well-supported by research and evidence.

PROJECT COMPONENTS

Action Guide: This guide examines evidence-based practices, identifies local exemplars, and offers research-informed recommendations for statewide actions that have the potential to address gaps and contribute to broad improvement in student outcomes. The report looks at the progress made and the challenges that remain, focusing on areas where new approaches could help foster the immediate success of all the Commonwealth’s learners. The report offers strategies that can be applied within schools, programs, and communities across Massachusetts, thereby grounding the research in real-world examples of success.

Community Conversations: Starting with the release of the Condition of Education Action Guide during January’s “COE Week,” the Rennie Center aims to host a series of conversations throughout the year that provide open spaces for educators and policymakers to consider evidence, discuss cutting-edge issues, and develop new approaches to student learning and achievement. These events take place in a variety of venues and seek to include individuals who bring a multitude of perspectives on the education system, helping to further advance recommendations found in our Action Guide while also informing and strengthening our next round of research.

Data Dashboard: The Rennie Center’s interactive Data Dashboard tracks a wide-ranging set of indicators on the Massachusetts education system, from early education through college and career. The tool brings together state- and district-level data on everything from student enrollment trends and teacher retention rates to school discipline data and test scores. Many of the indicators can be disaggregated based on race, gender, and socioeconomic status. The newest addition to the dashboard is our K-12 Data Explorer page, which allows users to dig deeper into specific metrics and compare district, regional, and county data.

transfer of information. It demands the ability to adapt, think critically, and apply ideas in ways that matter. When schools embrace these principles, education becomes more relevant—reflecting students’ passions and experiences, sparking curiosity, and building skills and connections students can use throughout their lives.

So how do we get there? The short, but profoundly challenging, answer is to rethink everything, including the structure of schooling, the rhythms of the school day, the way we teach, and even what we teach. Our education system must become as dynamic as the challenges it seeks to address, building an infrastructure to develop, test, and spread bold ideas. Research and experience already point us to myriad solutions for improving schools. Every day, committed educators in classrooms across Massachusetts experiment with innovative approaches to support their



students. However, without formal structures or dedicated supports, these ideas often fail to gain traction beyond their immediate use. They serve as metaphorical duct tape—except instead of securing a broken table leg or patching a leaky tent, they are strapping solutions to a flailing system. Consider a promising intervention like high-dosage tutoring, which has been shown to improve students’ academic performance.¹³ While powerful, it is often implemented as a temporary fix to help a small number of students “catch up,” rather than a foundational strategy for personalized learning that is integrated into daily instructional practice. A far more systemic approach to such solutions is needed—one that embeds effective innovations into the core of schooling rather than treating them as supplementary tools.

The Rennie Center’s *2025 Condition of Education Action Guide* is a bold invitation to fundamentally reconsider how we think about and pursue progress in education. To build schools that immerse students in learning experiences that are both relevant and deeply meaningful—experiences that prepare them for life—we must move forward with intentionality and innovation. The task is not easy. It requires leaders to harness educators’ expertise, integrate the latest insights from learning science, build on proven practices already in place, and deliver the meaningful learning experiences that students are seeking. But in the end, the biggest risk is not trying something new, but staying exactly where we are—watching the gaps widen, the outcomes stagnate, and the opportunities for change slip away.

In the sections that follow, we make our case for a new approach to education reform. First, we review the science of learning, drawing out key principles that ensure schools are engaging, relevant, and impactful for all students. Then, we turn to innovative school models, some operating within the traditional public system, others outside it, to examine how these principles are being applied in practice. Finally, we offer recommendations to the field, advocating for a systemic commitment to research and development (R&D) to sustain the complex but essential work of educational innovation across the state.

The Rethinking Education Agenda

The Rennie Center’s [Rethinking Education Agenda](#), launched in 2024, represents a bold initiative to transform the educational landscape by addressing the structural and practical norms of schools. The agenda is anchored in three pivotal domains: people, place, and time, emphasizing the need to rethink how these elements contribute to student success. The goal is not to promote specific policy solutions, but to ask critical questions we have avoided for too long: What if educators, often overwhelmed and undervalued, could work in environments that truly harnessed their skills? What if technology could level the playing field, erasing the boundaries imposed by geography and circumstance? What if time itself could bend to meet the developmental needs of students? These questions are not theoretical; they challenge deeply entrenched assumptions about schooling that bar the way forward.

| RETHINK PEOPLE | RETHINK PLACE | RETHINK TIME |
|---|---|---|
| <p>How is human capital organized?</p> <p>SCHOOL STRUCTURES & PRACTICES</p> <ul style="list-style-type: none"> Educator role Staffing models Educator training Student groupings Role of technology | <p>Where does learning happen?</p> <p>SCHOOL STRUCTURES & PRACTICES</p> <ul style="list-style-type: none"> Concept of a classroom Role of virtual spaces Community integration Bridges to higher education Employer involvement | <p>How is learning time structured?</p> <p>SCHOOL STRUCTURES & PRACTICES</p> <ul style="list-style-type: none"> School day schedules Academic calendar Course formats Age-based advancement Standards Assessment |

Central to the Rethinking Education Agenda is the [Rennie Center’s R&D Labs](#), a pioneering initiative designed to test and refine these transformative ideas in real-world settings. Through partnerships with schools across Massachusetts, from Boston to Springfield, the labs foster practitioner-led innovation, supported by researchers and improvement experts. By embedding research processes into public schools, the labs aim to generate actionable insights, scale successful practices, and establish long-term frameworks for sustained educational innovation. This collaborative approach, enriched by diverse perspectives and grounded in learning science, underscores the agenda’s commitment to redesigning an education system that empowers all students to unlock their full potential and thrive.

In this year’s Action Guide, the Rennie Center seeks to advance the Rethinking Education Agenda by grappling with recent lessons learned and pushing for further systemic change. True to its approach, the Rennie Center did not undertake this work in isolation but conducted interviews with education leaders and practitioners representing a range of perspectives from both inside and outside traditional school systems. Interviews began with fundamental questions about education’s purpose and then explored how learning can be structured to meet those goals. This process encouraged participants to think beyond deeply ingrained models of schooling. We also relied on an investigation into how students make meaning of the world around them, using insights from the science of learning to illuminate how schools can foster learning experiences that build on students’ innate curiosity and lay the groundwork for future success.

The complexity of the Rethinking Education Agenda and the questions asked means that definitive answers remain elusive, but the 2025 Action Guide charts a path forward, one that invites continued exploration and collaboration with students, educators, and leaders across the Commonwealth. Our hope with the 2025 Action Guide is not merely to spark conversation but to ignite action—launching a collective effort to rethink and rebuild an education system capable of meeting the needs of every student.

Grounding School Design in the Science of Learning

Think about a young child trying to ride a bicycle for the first time. She experiences a natural blend of curiosity and hesitation as she not only picks up a physical skill but also learns how to keep moving and how to correct mistakes in real time. Guidance from adults and peers may offer potential strategies for success, but the child must test them herself to see what works best. Perhaps most importantly, she must really want to learn how to ride the bike, despite the natural fear of falling, relishing the opportunity to go fast and far. This, at its core, is what the science of learning is all about: a dynamic process where the mind, heart, and environment collaborate to create lasting understanding.

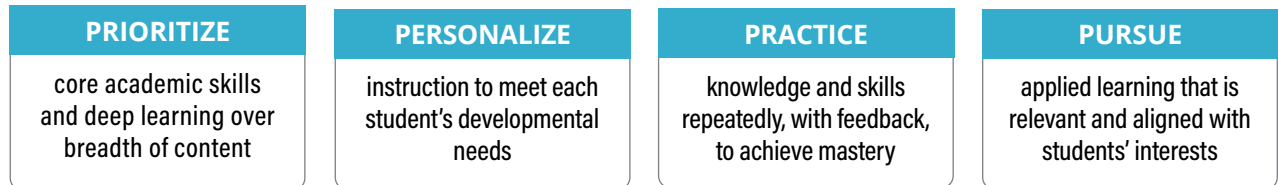
By better aligning school structures and practices with the science of learning, we can improve how students acquire and apply foundational knowledge and skills that unlock their future success. While the science of learning is an expansive literature that touches on all aspects of child development,¹⁴ there is a core set of research-based takeaways that directly relate to the purpose and design of schools:

- **Knowledge is constructed, not transferred.** Educators do not “transfer” knowledge; instead they facilitate environments where students are active learners able to discover and construct understanding themselves.
- **Prior knowledge matters.** Learning builds on what students already know. Prior knowledge shapes how new information is interpreted and integrated.
- **Social interaction is essential.** Through interaction and collaboration with educators and peers, students learn from others’ perspectives and deepen understanding.
- **Reflection helps learning stick.** Students need opportunities to reflect on their experiences, analyze their learning, and refine their understanding in order to build metacognitive skills, the ability to think about thinking.



Key takeaways from learning science provide a north star for educators in designing and delivering impactful learning experiences. Educators already work tirelessly to implement these principles in their instruction—but too often, the structures of schooling make it challenging to fully and meaningfully translate these principles into actionable strategies within the classroom. There is a need to ensure these principles extend beyond the design of instruction to the design of schooling itself. The section below offers a framework for school design grounded in learning science.

Pillars of School Design Grounded in the Science of Learning



Prioritize

Rethinking approaches to learning does not mean abandoning academics. Rather, all students need a strong foundation in basic facts and skills—especially literacy skills, numeracy skills, scientific reasoning, and civic understanding—which serve as a launchpad to all future learning. As students engage with more complex concepts, learning science shows that they learn most effectively when new information builds on their prior knowledge and existing mental frameworks.¹⁵ Focusing on deep mastery of core academic skills equips students to confidently explore new content across subjects.

Personalize

Any adult who has a relationship with a child knows that learning happens in fits and starts. The science of learning confirms this self-evident observation and the need for school structures and classroom practices—such as self-pacing, spaced practice, and interdisciplinary content—that account for differences in student development, interests, and needs.¹⁶ Personalized learning that helps each student master core skills before moving on to more advanced learning—as opposed to setting arbitrary, inflexible timelines for progressing through curricular units and assigning grade levels based solely on age—leads to increased engagement, improved outcomes, and greater motivation.¹⁷ Students gain a stronger sense of ownership over their learning because it meets them where they are and gives them the tools to grow. Personalized learning offers another key advantage by creating opportunities for strong, individualized connections between educators and students.¹⁸ By acknowledging that meaningful learning happens through relationships, this approach ensures every student feels known by their teachers, fostering their intrinsic motivation to learn.

Practice

Developing mastery requires consistent practice over time. Simple, repeated practice helps shift knowledge into long-term memory.¹⁹ Of course, this does not mean continuously drilling students on core concepts is sufficient. Students must build an understanding of the meaning behind the material as a foundation for retention. Hands-on learning opportunities provide an especially powerful means for students to practice what they have learned, while also helping educators gather valuable insights into students' understanding and areas for growth. Alongside diagnostic assessments, these insights equip educators with the information they need to provide effective feedback to students.²⁰ Timely educator input is essential to help students track their own progress, revise work, and build competence. On the whole, practice not only drives improvement but also enhances metacognition, empowering students to take ownership of their learning journey.

Pursue

Transferable learning is most effective when students are able to pursue subjects that genuinely interest them and apply their knowledge to authentic, real-world tasks where their skills make a tangible impact. Too often, learning in school feels disconnected from students' passions and future goals, and new information is quickly forgotten because it is not applied deeply or in ways that promote lasting understanding. The science of learning shows that students need opportunities to pursue areas of personal interest—like conducting research in their communities or partnering with local businesses to apply writing and computational skills—instead of completing generic assignments. Such experiences also build skills that are essential for future success, such as collaboration, critical thinking, creativity, and reflection through the planning and management of complex tasks.²¹ When paired with clear instruction and structured practice, applied learning in real-world contexts prepares students to thrive as successful adults.

Reshaping school design to align with the principles of learning science is not simply about finding ways to schedule new learning activities within the school day. We must take care not to metaphorically duct tape more solutions to a fractured system. Rather, we must embrace a bold willingness to reimagine how people, place, and time are organized in our schools in order to maximize the potential of each student. This necessitates rethinking staffing models to enable personalized instruction, harnessing the power of technology, restructuring school schedules to create space for applied learning, ensuring ample opportunities for meaningful relationship-building with students, and more.

To some, these changes may feel like asking an overburdened system to do even more. But by focusing on schoolwide change aligned with the science of learning, our schools can

reclaim time and energy for what really matters. In doing so, educators will be more supported in carrying out the practices they already champion—connecting lessons to real-world experiences, prioritizing holistic development, and inspiring enthusiasm and engagement through the application of core skills and knowledge.

In the next section, we present spotlights of schools from both within and outside the traditional education system that have aligned themselves with the science of learning, showing that it is possible to transform schools to promote the success of every student.



Applying Learning Science to Practice

SPOTLIGHTS FROM THE FIELD

Chelsea Public Schools: Closing Literacy Gaps through Virtual High-Dosage Tutoring

PROBLEM Many students are behind in literacy skill development and struggle to meet reading benchmarks.

SOLUTION Engage first-grade students who have not met reading benchmarks in daily one-on-one tutoring sessions held virtually.

LEARNING SCIENCE CONNECTION **Prioritize:** Educators focus resources (time, staff, funding, and technology) on foundational literacy skills.

When the time comes for reading instruction in a first-grade classroom at Frank M. Sokolowski Elementary School in Chelsea, Massachusetts, the room is abuzz with excitement. Some students eagerly grab tablets and headphones and get settled at their desks for a one-on-one session with a virtual tutor. Others gather with a reading specialist or the classroom educator. This mix of individual and small-group instruction represents a highly personalized approach to literacy. At the heart of the model is virtual one-on-one tutoring provided by Ignite Reading.

Research has clearly demonstrated that high-dosage tutoring—one-on-one or small-group academic sessions held at least three times per week—is highly effective at boosting academic proficiency and closing achievement gaps. In building high-dosage tutoring into academic schedules, the challenges many schools run into are recruiting and paying for local tutors to come to their classrooms. The use of virtual tutors can remedy this issue.

With funding from the One8 Foundation, Chelsea Public Schools has partnered with Ignite Reading to offer literacy tutoring for 15 minutes every day to students who are behind.²² Tutors—who receive 100 hours of training from Ignite Reading, including 40 practicum hours—deliver high-quality literacy instruction and leverage student progress data collected through the virtual platform to individualize their approach for each student. Tutors work with the same student all year, developing meaningful relationships that lead to stronger student engagement and more effective personalization.



By embedding robust literacy tutoring into the first grade, Chelsea leaders created a proactive approach to building students' foundational skills. Too often, schools intervene only in later grades when students have fallen far behind. Research shows a host of negative long-term outcomes for students who complete the third grade without learning to read. As a result of this research, many schools embed robust literacy interventions in the third grade—after some students have endured years of struggle. Chelsea's approach intervenes early, helping students build a strong foundation for higher-level learning.

Initial outcomes from this model show great promise. In a study of 13 Massachusetts districts that have partnered with Ignite Reading, researchers at Johns Hopkins University found that the percentage of tutored students meeting literacy benchmarks grew from 16% to 50% throughout the school year, indicating the model's effectiveness at closing learning gaps.²³ Compared to non-tutored peers, tutored students achieved literacy skill gains corresponding to nearly a full month of additional learning per student. Gains were similar across subgroups, including marginalized students, English learners, and students with IEPs. While some educators were initially skeptical about introducing the model, most now view it highly favorably. They find that their students are excited to engage in tutoring and that the model offers a level of personalization that the educator on their own could simply never provide. Further, the model frees up educators to lead small-group instruction while some students are receiving tutoring, enabling greater differentiation for all students.

For young learners in Chelsea, rapidly growing literacy skills have resulted in confidence across academic subjects. As these students progress in their education, their literacy competence will unlock doors to higher-level learning and to postsecondary pathways of their choosing.

Alpha School: Mastering Core Academics in Two Hours a Day through AI-Powered Learning

PROBLEM Academic courses take up the majority of the school day, yet many students still struggle to master core skills.

SOLUTION Leverage artificial intelligence (AI) to deliver personalized, competency-based core instruction in 2 hours per day.

LEARNING SCIENCE CONNECTION **Personalize:** The school provides every student with individualized core coursework aligned to their unique needs.

In an education system that prioritizes standardization over individualization, every student is expected to progress at the same pace. The result? Core instruction takes a really long time, as educators struggle to find a balance between supporting struggling learners and challenging those ready to advance.

Alpha School, a private K-12 school with campuses in Texas and Florida, flips the traditional model by leveraging AI tutoring applications to deliver core academic coursework in just two hours per day. AI-enabled platforms tailor instruction for each student to accommodate their level of proficiency and focus on their challenge areas. This approach helps students build core skills efficiently and to mastery.

Instead of academic educators, the school has guides, whose role is to motivate students and support them to become self-driven learners. Guides support students if they are struggling with content, help individualize the learning process, and teach life skills. The school has experienced considerable success with its personalized, mastery-based model, with

students growing 2.6 times faster than peers on nationally normed MAP tests, which measure growth and proficiency in core subjects.

Completing core academics in two hours leaves Alpha students with a full afternoon to devote to interest-based projects and life skills workshops. Though core instruction looks similar across Alpha’s campuses, schools have different approaches to focusing on skill-building in the afternoon. At one of Alpha’s campuses, Texas Sports Academy, students spend afternoons developing their athletic passions. At other campuses, students build public speaking skills, participate in financial management workshops, and engage in outdoor learning. Although core instruction takes place digitally, many students find they spend less overall time on screens than they did in traditional school environments.

Core instruction at Alpha includes the following subjects, not necessarily in this order:

| SUBJECT | TIME |
|--|------------|
| Math | 25 Minutes |
| BRIEF BREAK OR RECESS | |
| Science & Social Science | 25 Minutes |
| BRIEF BREAK OR RECESS | |
| Language & Writing | 25 Minutes |
| BRIEF BREAK OR RECESS | |
| Reading | 25 Minutes |
| BRIEF BREAK OR RECESS | |
| Additional Math or Learning Strategies | 20 Minutes |

Salem Public Schools: Redesigning Middle School to Center Real-World Learning

PROBLEM Students experience low engagement, reflected in part by high absenteeism rates.

SOLUTION Pilot a new middle school model that prioritizes coursework based on design thinking and incorporates learning immersions that use the community as the classroom.

LEARNING SCIENCE CONNECTION **Practice & Pursue:** The school creates opportunities for students to build metacognitive skills, drive their own learning, and apply their knowledge to real-world contexts.

Schools have long relied on a set of attendance interventions that seek to address the reasons why students miss school. Schools connect families with new transportation options, address health needs, and support access to housing. Educators visit homes to draw up attendance contracts with families. Sometimes, however, none of these interventions work. Why? They tend to focus on everything except the student learning experience. As chronic absenteeism rates rose at Collins Middle School in Salem, Massachusetts, over the past several years, school and district leaders asked themselves: “What if school itself is the problem?”

To answer this question, leaders knew they needed to seek out student perspectives. The feedback they gathered was sobering. Less than a quarter of students reported loving school, and even fewer said they found their education interesting. Recognizing a need to rethink the learning experience, Salem Public Schools partnered with WPS Institute to pilot a student-centered approach that emphasizes connection, engagement, and personal growth. Instead of learning within the four walls of a school building, students go into the community to participate in learning immersions.



In October, when the City of Salem was flooded with Halloween enthusiasts, students analyzed the impact of “Haunted Happenings” on their community. They counted cars, met with vendors and business owners, and interviewed tourists to understand the financial, cultural, and social impacts of Halloween festivities on Salem’s economy and residents’ lives. Unlike traditional field trips, which are often disconnected from core academics, learning immersions serve as a key method through which educators address state academic standards.

Even when students learn within the middle school building, the experience differs significantly from traditional school. Twice per week, students participate in design studios. These hands-on projects are taught by science and social studies educators and aim to enhance students’ transferable skills like collaboration and creativity. For example, one design studio developed in partnership with NuVuX focused on leveraging biotechnology to build deep sea robots that could address local environmental concerns, from pollution to sea level rise. Students visited the New England Aquarium to learn about biomimicry and understand how aquatic creatures interact with their ocean environments. Based on this learning, students then created robot prototypes that mimicked marine creatures to mitigate pressing challenges.

With fewer hours of classroom-based instruction, students participating in the pilot have outperformed their peers on MCAS assessments. More importantly, attendance rates have improved dramatically, along with the percentage of students reporting that they love school. Demand from students and families has been so high that the district decided to scale the pilot to the entire eighth grade at the start of the 2024–25 school year, with plans to scale in developmentally intentional ways to the sixth and seventh grades in the 2025–26 school year. Salem educators continue to improve the work based on student feedback, regularly collecting data to help them shape the future of Salem’s middle schools.

Watershed School: Engaging Students in Work that Matters

PROBLEM Traditional learning focuses on artificial tasks that are disconnected from community needs and challenges.

SOLUTION Create opportunities for students to pursue work that matters for an audience beyond their school.

LEARNING SCIENCE CONNECTION **Practice & Pursue:** The school offers a mixture of skills and expedition courses for students to apply foundational skills to real-world problems.

Each year in the United States, 16 million high school students collectively participate in 20 billion hours of schooling.²⁴ A tiny fraction of these hours is devoted to work that has resonance beyond the school building. Watershed School, an independent school in Boulder, Colorado, seeks to offer a different approach for its middle and high school students, engaging them in cross-disciplinary coursework and creating opportunities for students to produce work that matters beyond the walls of the school.

When students enter the school, they are greeted by a wall-sized painting of 25 great challenges of our time, all focused on opportunities for human progress and the creation of a more equitable society. Among them are “Reducing Inequalities,” “Climate Action,” and “Engineer the Tools of Scientific Discovery.” Many are based on the Sustainable Development Goals set by the United Nations.

Exploring these challenges in a cross-disciplinary manner is a core aspect of students’ learning experience. Coursework is organized into two categories: skills courses and expedition courses. Skills courses focus on the core content and abilities



students need for future success, such as quantitative reasoning, communication, and robotics. Expedition courses are guided by essential questions aligned to the world's great challenges and provide opportunities for students to apply their skills across disciplines and engage in a learning process driven by their curiosities.

A humanities expedition course titled “Democracy, Politics, and Rights” asks students to explore political polarization in the U.S. and other Western democracies. In their studies, students grapple with the causes of polarization and the elements of a functioning democracy. Students learn by exploring issues in recent elections and engaging in a student-driven project designed to build empathy and understanding among people with different perspectives. These projects are shared with the community to elevate the importance of connecting across lines of difference.



The cross-disciplinary nature of expedition courses provides fertile ground for students to pursue work that matters. Given that complex problems rarely fit neatly into a single academic discipline, students have opportunities to blend perspectives from the sciences, arts, and humanities to address community challenges, often through the use of technology. Recent work includes:

- Students partnering with the University of Colorado Anschutz Medical Campus to create a centralized online hub containing well-being resources for anesthesiology providers facing immense stress while working with COVID-19 patients; and
- Students partnering with a local non-profit consulting firm to reimagine how the firm's in-person workshops and events could be translated to the digital world.

In order to engage students in comprehensive explorations of real-world topics, Watershed educators prioritize depth of learning over breadth of content. Focused on equipping students to succeed in postsecondary education and contribute to society, educators create learning experiences that build students' ability to unlock their own learning and express their ideas.

See the Appendix for an example of a Massachusetts charter school that is drawing on multiple principles of learning science to design meaningful learning experiences for students.

Investing in Education R&D

In order to accelerate the identification and implementation of effective strategies to ground school design in the principles of learning science, such as integrating technology to personalize learning or encouraging student-led exploration of local community issues, our education system needs a heightened commitment to research and development (R&D). Strengthening education R&D infrastructure would empower local education leaders to tailor strategies to their unique contexts, yielding more relevant learning for students and a more enjoyable work experience for educators. Plus, an active R&D sector provides timely feedback, promoting continuous improvement to anticipate the needs of today and tomorrow.

The concept of R&D is not new. It has long been the driving force behind innovation in the private sector, where consumers expect steady improvements in products and services. The technology industry, in particular, aggressively pursues and applies new ideas, often with the intention of not only improving user experiences but also disrupting traditional ways of doing business.²⁵ Consider the rise of Apple. While not the first company to sell personal computers, Apple transformed how we think about and use technology. Its 1984 ad for the Macintosh positioned technology as a tool for personal empowerment, freeing users from the monotony and constraints of corporate life. Later, Apple's iPod campaigns burst with color and rhythm, suggesting

technology could be intimate, vibrant, and joyful. The iPhone built on this foundation, embedding personal technology into daily life and allowing users to do everything from checking the weather to sharing their fondest memories.

While disruptive innovations have reshaped private industries, applying an R&D mindset to public systems like education is more complex due to the inherent challenges of navigating established administrative systems, addressing equity concerns, and meeting the diverse needs of stakeholders. Public education rightfully operates within a framework that prioritizes accessibility and fairness, requiring solutions that balance innovation with inclusivity and long-term sustainability. Additionally, an ethos of innovation in education demands caution. The mantra often associated with private-sector entrepreneurs—"Move fast and break things"—is ill-suited for education, where the stakes involve the well-being of children, classrooms, and entire generations of learners. Compounding these challenges, schools face finite resources and tightening budgets, especially with the end of federal funding to mitigate the impacts of COVID-19.

A carefully constructed R&D framework in education must address these challenges in order to deliver lasting, meaningful change.



PHOTO: Ignite Reading

This is not to say R&D cannot thrive in publicly regulated industries. In other fields like healthcare, R&D happens alongside practice, enabling real-time testing and scaling of successful innovations. This model has produced groundbreaking advancements such as vaccines, precision surgeries, and novel therapies once unimaginable. Yet in education, R&D remains woefully underutilized, with federal investment in fiscal year 2022 at just \$2.55 billion, or 1% of federal education funding²⁶—a fraction of the \$45 billion allocated to healthcare R&D.²⁷ Systematizing R&D in education will require leveraging unique public assets to empower, expand, and sustain entrepreneurship.²⁸ More specifically, public officials and education leaders can leverage four governmental assets to promote innovation.

Government Assets to Promote Innovation

The Purse

Government funding and public investment are essential for successful R&D. Federal and state grants, along with dedicated research budgets, encourage experimentation that may otherwise be too risky or costly for individual actors or organizations. This financial support sustains ongoing projects and attracts partnerships with private organizations. In addition, governments wield enormous purchasing power, often serving as the largest buyer of goods and services in key sectors. They can strategically leverage this influence to promote innovation by steering markets toward more low-cost, disruptive approaches.²⁹

The Rules

Flexible regulations can serve as a catalyst for innovation in the public sector. By granting waivers or relaxing specific policies, governments can create the conditions necessary for experimentation and transformative change. For example, waiving accountability requirements, adjusting calendar constraints, or rethinking seat time mandates would allow schools to more easily explore alternative models like competency-based education. These regulatory adjustments not only encourage creativity but also provide opportunities to identify scalable, effective practices that better serve diverse student populations.

The Markets

Public sectors are often composed of a variety of smaller, specialized market segments, each with its own dynamics and opportunities for innovation.³⁰ In education, examples include instructional materials, mental health programs, arts education, and specialized interventions for diverse student needs. By recognizing these diverse segments, governments can carve out spaces for targeted experimentation, enabling education entrepreneurs to address specific needs rather than overhauling the entire system. This perspective opens up a far more dynamic marketplace where multiple providers—including for-profit businesses, non-profits, and advocacy coalitions—contribute to innovative solutions, fostering meaningful and scalable change across distinct educational areas.





PHOTO: Powderhouse Studios

The Bully Pulpit

Public sector R&D requires more than resources and favorable policies; it demands a cultural shift that government leadership can help inspire. By using their platforms to champion innovation, policymakers can help educators feel supported in taking calculated risks. Further, many freedoms and opportunities for experimentation already exist within the education system, but they are often underutilized due to a lack of awareness or fear of failure. Governments must not only promote these opportunities but also create a sense of security and encouragement around trying new ideas. Finally, by amplifying and celebrating innovation, governments can build momentum for transformative change and inspire widespread adoption of effective practices.

Strategically leveraging public sector strengths to drive innovation represents a critical shift from past reforms aimed at cultivating new models of schooling, which were largely rooted in granting wide autonomy for experimentation without providing direction or support. This approach frequently placed educators in the difficult position of completely redesigning schools or building them from scratch. Charter schools, for instance, were initially envisioned as experimental spaces where educators could develop innovative practices and redefine traditional learning environments. More recently, the authorization of Innovation Schools in Massachusetts sought to achieve similar goals through district approval and greater collaboration with labor and community stakeholders.³¹ However, while many individual schools created through these efforts benefited the students they enrolled, their broader systemic impact has been limited due to a lack of integration with the traditional education system. Moreover, the traditional system faces political and logistical challenges, such as securing funding, navigating facilities issues, and renegotiating collective bargaining agreements, that often hinder the adoption of effective innovations. These challenges conflict with the fast-paced, iterative nature essential for effective R&D. A more agile and supportive environment—created through channels for collaboration, streamlined bureaucratic processes, and targeted guidance—can better position district leaders and educators to innovate.

A strong example of creating a more direct interplay between state government, local schools, and education partners to support R&D was the [Rethinking Grading Pilot](#) by the Massachusetts Department of Elementary and Secondary Education (DESE), and supported by the Rennie Center and reDesign, from 2022–2024. This initiative supported five

Massachusetts high schools to rethink traditional approaches to student assessment and feedback. State funds provided for the release of an educator at each school from traditional duties to focus on developing and supporting institutional changes with direct assistance from a DESE liaison, who provided guidance on navigating state policies. Schools tested a range of innovative strategies: Melrose High School standardized grading criteria across classrooms, South Shore Vocational Technical School adopted a competency-based grading scale aligned with state standards, and Springfield International Charter School introduced a dual-grading system with narrative feedback to distinguish between content mastery and transferable skills, like communication and leadership. Local flexibility in school policies and practices empowered innovation, while close



collaboration with DESE offered assurance that initial misalignments with accountability measures would not hinder their progress. The initiative was also supported by a community of practice, enabling participating schools to share insights, learn from one another, and promote new grading approaches. Perhaps most importantly, the schools quickly learned that rethinking grading required rethinking their overall approach to teaching and learning, pushing many of the participating schools to advance broader school-wide changes, such as altering formative assessment systems, school schedules, and student access to electives.

Unfortunately, the Rethinking Grading Pilot ended in June 2024, highlighting another challenge with R&D. Too often, the focus on specific reform issues—such as smaller schools, flipped classrooms, or hybrid learning—shifts as other concerns take priority, leading to the end of investments in R&D. This does not mean R&D should not focus on particular issues. As noted above, recognizing that public education is made up of numerous small markets with a mix of public and private organizations working to improve services is a critical step in targeting impactful public investments. But the overall commitment and investment in the infrastructure that makes R&D possible should not be beholden to specific reform ideas.

To build a robust statewide approach to R&D, it is imperative to consider how public investment can sustain innovation over time, how systems can be designed to scale promising practices, and how governance structures can create alignment between local, state, and intermediary efforts. Importantly, this is not a challenge any single entity can tackle alone. The field must come together to create a collaborative process for determining how to fully support R&D, recognizing the importance of tailoring approaches to meet diverse needs. We propose three core strategies to build a stronger R&D system that can inform school improvement.

Strategies to Foster Education R&D

Encourage a culture of innovation

Despite a wealth of insights from learning science about how students learn, there is no clear roadmap for education leaders striving to design school models rooted in this literature. The schools presented above, for example, prioritized different learning needs and pursued different instructional approaches in order to develop school models that both aligned with the science of learning and catered to their local contexts. To create an environment that is conducive to this kind of transformative innovation, education leaders must prioritize experimentation, calculated risk-taking, and reflective learning. This requires embracing uncertainty and empowering educators to explore new approaches without fear—which could be enabled by providing professional development opportunities, revising policies to encourage experimentation, and fostering a supportive community for sharing and refining ideas. State and local governments play a pivotal role in fostering this environment by championing innovation from the bully pulpit to counteract the automatic pushback that often accompanies new ideas, as well as using existing public resources and communication structures to share new practices with the broader field.

Create space for experimentation

A key factor in driving meaningful change in education is establishing dedicated spaces for experimentation within traditional school districts. Research on innovation in the private sector has demonstrated the power of autonomous units within an organization that use their operational freedom to focus on R&D. These units are typically designed to work outside the constraints of the organization's traditional bureaucracy, allowing them greater flexibility, creativity, and agility. Drawing inspiration from this research, schools and districts can pilot programs with minimal bureaucracy that report directly to district leadership.

This approach does not require creating new schools. Instead, districts can designate space within existing schools for R&D pilots. Such pilots are most effective when they begin with a coalition of willing educators. For instance, a school might gather a team of educators from kindergarten through the second grade who are committed to testing out innovative learning methods. The school would then assign a dedicated leader to oversee the pilot, with this leader reporting directly to the superintendent to separate the pilot from school practices and requirements. To succeed, the pilot leader must have the authority to adapt policies, temporarily waive certain regulations, and collect data to assess whether new practices tested by the pilot outperform previous practices. As effective innovations emerge, demand will increase, enabling expansion first within the school and eventually across the broader system.

Such an approach was used by Salem Public Schools to pilot their middle school redesign initiative, described above. The district's Dean of Innovation, who works with schools and external partners to develop new learning opportunities, built the initiative with a design partner, a group of willing educators, and a voluntary cohort of students and families. As demand for the model has grown, the district has scaled it to all eighth-grade students.

Adopt continuous improvement methods

In conducting R&D, the process of designing, implementing, and assessing the impact of change must be as thoughtful and deliberate as the change idea being pursued. To this end, districts can draw from extensive research and practical guidance on continuous improvement (CI) methods, which emphasize rapid iteration, feedback loops, and incremental improvements.³² CI processes enable schools to test, refine, and scale new ideas efficiently, a critical capability when working to establish new innovations. By embedding CI methods within spaces of experimentation, districts can accelerate the development of breakthrough programs and practices.

In sum, a comprehensive, state-driven effort with significant investment is essential to create an education system that fosters success for all students. Central to this work is the development of a cutting-edge R&D sector to effectively design, test, and implement the learning approaches students require for future success. The following figure outlines a cohesive framework that integrates the key elements of this report, illustrating how to drive the transformative change our system needs and our students deserve.

Rethinking Education Roadmap



Recommendations

Now is a unique moment in the history of Massachusetts' public education system—a time of both challenge and opportunity that demands bold action. While districts in other states have begun experimenting with opportunities to rethink the teaching job, leverage AI to accelerate learning, and challenge traditional school structures, such innovations are currently rare in the Commonwealth. Massachusetts, a state renowned for its leadership in education, has tremendous potential to position itself as a pioneer in designing, testing, and scaling transformative educational models.

To do this, policymakers should develop a **systemic approach to R&D in Massachusetts public schools**. As education leaders work to build the R&D system, we can draw on a wealth of knowledge about what makes R&D effective, the conditions that foster innovation, and the foundational principles of learning science. This section describes actionable steps to advance a statewide investment in R&D.

1. Create a statewide vision for education reform

A strong, ambitious, and achievable vision is the foundation of impactful R&D in the public sector. Although DESE currently has an Educational Vision, this vision has not been widely communicated and lacks the boldness and specificity needed to differentiate the future state of the Commonwealth's schools from the status quo in K-12 education. To kickstart a systemic approach to R&D, education leaders must articulate a vision grounded in learning science that builds a shared understanding of the future of Massachusetts schools. This vision will provide critical focus for all R&D efforts, ensuring all initiatives address relevant challenges and work towards collective impact.

Massachusetts history demonstrates the importance of a shared vision in guiding effective policy, as seen in transformative moments like the 1993 Education Reform Act. The vision behind this reform focused on providing equitable access to high-quality instruction for all students, and the vision was clearly articulated through the establishment of rigorous academic standards, statewide assessments, and increased funding for underperforming schools. Massachusetts needs to draw lessons from its past by aligning its investment in R&D with clear objectives for the state's education system. The vision should help all stakeholders understand the direction the system is moving in and show how their local R&D efforts contribute to shaping this future.

2. Convene Massachusetts educational innovators to guide policy development

The Commonwealth is home to many forward-thinking individuals who have spent decades prototyping innovations and connecting research and practice within schools. For many of these innovators, including some of those we interviewed, partnering with public school districts proved too difficult, leaving promising ideas unrealized. The founder of ACERA School in Winchester, Massachusetts, for example, envisioned creating an innovation school focused on personalized learning and STEM exploration but could not secure a district partnership.³³ Similarly, Powderhouse Studios in Somerville, Massachusetts, designed a project-based learning and creative problem-solving model with a \$10 million grant from the XQ Institute but faced insurmountable challenges with resource allocation and administrative support, ultimately choosing to operate independently. To create effective state-level policy that encourages vision-aligned R&D, we must learn from the challenges that these and other innovators have faced.

Several leaders interviewed for this report emphasized that regulations were not the primary obstacle they encountered when exploring new models. Instead, as they worked to transform educational structures, they found themselves constrained by a system designed to impede progress rather than facilitate it. When convening

innovators, it will be crucial to uncover specific non-regulatory challenges they face. Equally important will be identifying the support necessary to connect isolated innovations, such as those highlighted in this report, with the broader educational system.

3. Produce a policy inventory to identify policies that promote and limit R&D

Based on input from Massachusetts education innovators and the broader field, policymakers should conduct a comprehensive inventory of existing state and local policies to assess how they either support or hinder R&D in public schools. By systematically reviewing current policies, leaders can identify areas where existing frameworks, funding mechanisms, and practices already foster innovation and provide a conducive environment for experimentation. For example, Massachusetts has existing policies related to the governance of in-district and autonomous schools, including Innovation Schools and Horace Mann Charter Schools, that can be leveraged to provide necessary regulatory flexibility.

At the same time, this inventory will uncover policies that may inadvertently serve as barriers to R&D, such as assessment practices and seat time requirements. Understanding how policy can both promote and limit innovation will allow policymakers to selectively relax restrictive policies and create a more supportive landscape for R&D in education.

4. Build a statewide infrastructure that supports R&D in public schools

Input from Massachusetts educators, district leaders, and innovators should guide the development of a dedicated R&D Hub, designed to provide the necessary infrastructure for schools to engage in meaningful research and experimentation. This Hub will serve as a central resource for capacity-building, offering training, tools, grants, and incentives to support R&D initiatives.

For example, the state could explore ways to leverage the flexibilities granted to Innovation Schools and Horace Mann Charter Schools to create Lab Schools modeled after autonomous innovation units in the private sector. As noted in the section above, these do not need to be new schools or whole-school conversions. Rather, Lab Schools can be traditional public schools that carve out space for R&D pilots. These pilots must have the autonomy to experiment with new ideas without the constraints of traditional district regulations, enabling them to fundamentally rethink their models. Unlike today's Innovation Schools and Horace Mann Charter Schools, Lab Schools would have access to dedicated funding, coaching, and support from the R&D Hub. In addition to facilitating bold innovation, the Hub would ensure that novel ideas are aligned to the state's vision for education reform.

As stated by Powderhouse Studios, "the organizations which best invent the future often do so by living it themselves." The R&D Hub would ensure that those working within public schools have space and power to identify problems, prototype solutions, research their effectiveness, and communicate their results.



Conclusion: Where We're Headed

As famously stated by Horace Mann, founder of the common school, education is “the great equalizer of the conditions of men—the balance-wheel of the social machinery.”³⁴ Nelson Mandela shared the same sentiment a bit more directly: “Education is the most powerful weapon which you can use to change the world.”³⁵ Schools are where the balance wheel turns, the central force necessary for fully realizing our shared investments in ourselves and one another. They set the foundation, providing structure for students to acquire and apply the knowledge and skills needed to become successful adults. Whether a student dreams of college, a career, or building a stronger family and community, it is through effective schooling that these ambitions become possible. So why, in classrooms all across the country, do students relentlessly ask, “Why do I need to know this?”—a question that speaks as much to the challenge of relevance as it does to the power of learning itself.

We stand at a unique moment in the history of U.S. public education, as educational innovations are emerging rapidly without the comprehensive system needed to fully support them. From new teaching methodologies to personalized learning approaches, schools are experimenting with a wide range of ideas aimed at improving student outcomes. These innovations currently face challenges due to fragmented policies, inconsistent funding, and a lack of infrastructure to scale and sustain them. Massachusetts, with its history of nation-leading education policy, has the opportunity to reclaim its status as a hub of educational innovation by launching a systemic, statewide approach to R&D. With high academic standards, well-qualified educators, and strong public support for education, Massachusetts has a solid foundation upon which to design new models.

APPENDIX:

Putting It All Together

The spotlight below presents an example of a Massachusetts school whose carefully designed educational model centers the four principles outlined in this report for grounding school design in learning science—thereby creating a schooling experience that feels purposeful and engaging for students and prepares them well for future success.

Francis W. Parker Charter Essential School: Empowering Students to Think Critically Across Disciplines

PROBLEM Traditional schooling is not student-driven, resulting in low engagement.

SOLUTION Put students in the driver's seat of their learning by employing educators as coaches, with ample collaboration between educators to promote cross-disciplinary connections and personalization.

LEARNING SCIENCE CONNECTION Combine the four Ps (**Prioritize-Personalize-Practice-Pursue**) to reimagine the secondary school experience.

Francis W. Parker Charter Essential School, a six-year secondary school in Devens, Massachusetts, has reimaged traditional school structures to great effect. In line with one of the school's guiding principles, "student-as-worker, teacher-as-coach," educators' role is to guide students through the process of inquiry, engage them in critical thinking, and create space for students to construct their own knowledge. Educators are trained to be acutely aware of students' successes and struggles and to adapt on their feet to nurture students' higher-order thinking skills, with the ultimate goal of helping students "use their minds well." To grow their skills as coaches and expert learners, educators engage in professional development every Wednesday afternoon, with students released early to create space in the school schedule.

In support of this pedagogical approach is a cross-disciplinary instructional schedule designed to ensure that students receive ample opportunities to think critically about connections between subject areas. More specifically, academics are organized into four domains that unite related disciplines and prioritize core skills: arts and humanities; mathematics, science, and technology; Spanish; and wellness. Within each domain, educators specializing in different disciplines are paired together in so-called dyads—for instance, math and science or literature and social sciences—to co-teach two-hour academic blocks. All instruction is inquiry-based and designed around an essential question. In the upper grades, students complete advanced inquiry-based coursework and work on an independent capstone project.

Zooming out, a student's educational journey at Parker takes them through three phases of learning, or divisions: Division 1 approximates grades 7 and 8, Division 2 approximates grades 9 and 10, and Division 3 approximates grades 11 and 12. However, advancement from one division to the next is dependent on meeting standards, not reaching a specific age. Classes consist of 15 to 25 students within the same division, meaning student groupings reflect relatively similar skill levels but multiple ages. Within these groupings, instruction is highly personalized: ample collaborative planning time built into the school schedule allows educators to discuss individual students' needs with their colleagues and plan supports. Educators receive roughly nine hours of planning time each week, half of which consists of structured meetings—for instance, meetings of an educator dyad or all educators within a domain.



Learning at Parker is standards-based and geared towards skill mastery. Students are assessed on a set of essential skills—including reading, writing, mathematical problem-solving, scientific investigation, systems thinking, research, artistic expression, oral presentation, and others—using rubrics that outline mastery standards. Students do not receive letter grades or class ranks and are expected to revise coursework per educator feedback until mastery standards have been met. Students complete a “Year-End Portfolio” in each academic domain to demonstrate skill growth, and to advance to the next division in that domain, students complete and publicly present a “Gateway Portfolio.” This approach to standards and assessment ensures that the school prioritizes skill mastery rather than subjecting students to sink-or-swim instruction that leaves some students behind.

As a result of its innovative model, Parker offers an educational experience that promotes student agency and equips students with the faculties to be lifelong learners. Students feel motivated by their educators, supported in mastering skills, and empowered to make connections within all they learn. Critically, instruction at Parker is rooted in the joy of learning. The school’s pedagogical approach aims not to rank and sort students but rather to champion discovery and possibility for all, cultivating a sense of enjoyment and purpose for students and educators alike.

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