THE NEW OPPORTUNITY TO LEAD

A vision for education in Massachusetts in the next 20 years

MBAE

MASSACHUSETTS BUSINESS ALLIANCE FOR EDUCATION

Brightlines

About MBAE

The Massachusetts Business Alliance for Education (MBAE) was established in 1988 by employers concerned about the educational attainment and skills of graduates entering the workforce. Our core work – improving public schools by influencing state policy – is driven by the business community's commitment that all students graduate prepared for success in college, career and citizenship.

About Brightlines

Brightlines, led by Sir Michael Barber acting in a personal capacity, brings together unrivaled global education experts who have advised, researched and written extensively on the subject. Moreover, they have also led highly successful large scale transformations in education systems across the world. Brightlines partners have worked with states and cities across the US to deliver education improvements including in Ohio, Louisiana, California, Delaware, Kentucky, Tennessee, Wisconsin and New York City. In addition, collectively they have developed, delivered and/or advised on education strategy and reforms across 6 continents and in many different countries including the United Kingdom, Ontario province in Canada, a number of states in Australia, Hong Kong, Singapore, Brazil, Chile, India and Pakistan.

About the Lead Authors

Sir Michael Barber is a globally renowned education reformer who has worked on education reform in over 40 countries and has led this work for MBAE in a personal capacity. Formerly Head of the British Prime Minister's Delivery Unit, Michael was also an author of McKinsey's influential reports on global education systems *How the World's Most Improved School Systems Keep Getting Better* and *How the World's Best Performing Education Systems Come Out on Top*. With Katelyn Donnelly and Saad Rizvi, he was coauthor of the influential reports *Oceans of Innovation* and *An Avalanche is Coming*. He is also leader of Pearson's worldwide program of research into education policy and efficacy.

Simon Day worked with Sir Michael Barber in the British Prime Minister's Delivery Unit where he led work on improving the performance of secondary and primary schools and supported the implementation of the highly successful London Challenge program. He has also worked in the UK Department of Education. He is currently working as a consultant on education reform in the UK in England and Wales, and has worked with a number of states in the US supporting the implementation of Race to the Top and other reforms.

This project was made possible with grants from the Barr Foundation, Bill and Melinda Gates Foundation, and the Nellie Mae Education Foundation.

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PREFACE

A projected shortfall of highly skilled, college-educated workers is intensifying the global competition for skilled talent. This should be cause for alarm in Massachusetts where our knowledge and innovation-based economy is highly dependent on a well-educated workforce and where demand for workers with postsecondary degrees is now outpacing the supply. According to the Massachusetts Department of Higher Education, in STEM (science, technology, engineering and math) disciplines alone, 36,000 fewer associate and baccalaureate degrees will be granted than the Massachusetts workforce will need by 2020.

Employers have long recognized that a well-educated citizenry is essential, not only (or even primarily) to create a pool of skilled employees or consumers, but also to sustain the kind of knowledgeable democratic community in which we all want to live and raise our children.

The Massachusetts Business Alliance for Education (MBAE) was established twenty-five years ago to advance this goal in response to a challenge similar to what we face today. *A Nation at Risk* warned that the "the educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a Nation and a people."

MBAE's founders produced a blueprint, *Every Child A Winner*, that provided the framework for the Massachusetts Education Reform Act of 1993. The implementation of that statute improved our schools to the point that we now have the best performing students in the nation, as measured by national and international standardized test results. However, it has become increasingly clear that the steady progress of education reform over the past two decades has stalled and the chronic achievement gaps between rich and poor have not been closed.

Now, it is not enough simply to tweak the existing system. So, MBAE is developing a plan for the fundamental transformation that is needed.

It is a plan that is deeply influenced by this study that MBAE commissioned Sir Michael Barber and his colleagues at Brightlines to undertake. MBAE posed two questions to Barber: where does Massachusetts stand against the best educational systems in the world, and what would it take for Massachusetts to become the best in the world at educating students for informed citizenship and productive employment in the 21st century.

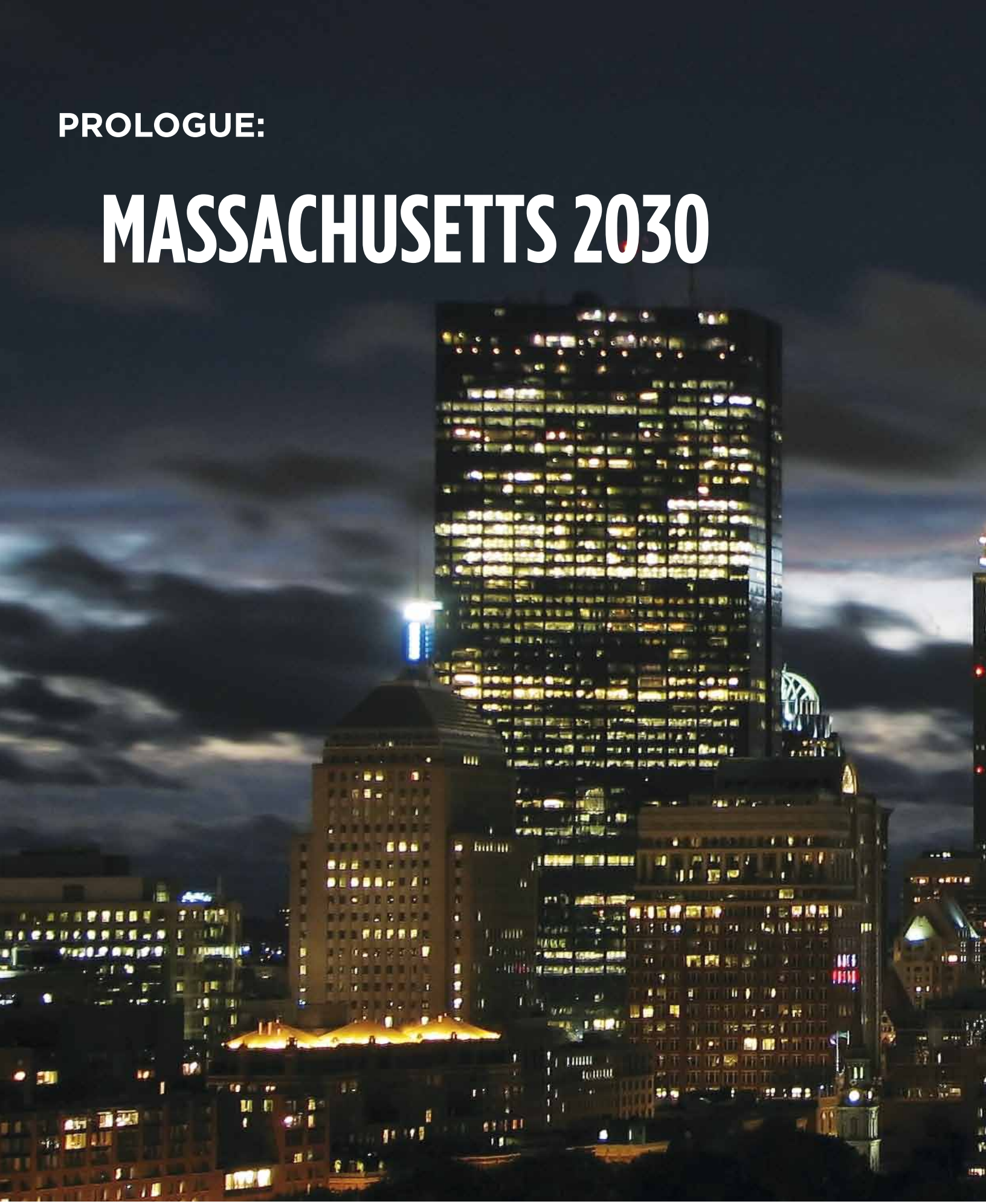
This comprehensive report prepared by Brightlines confirms that progress in improving public education in Massachusetts, despite the real improvements and successes of the last twenty years, has stalled. Massachusetts is far from the best in the world. Some countries are ahead of us and pulling away. Others are catching up with us fast and will soon pass us if we do nothing. Indeed, by some metrics several other US states are improving faster than Massachusetts.

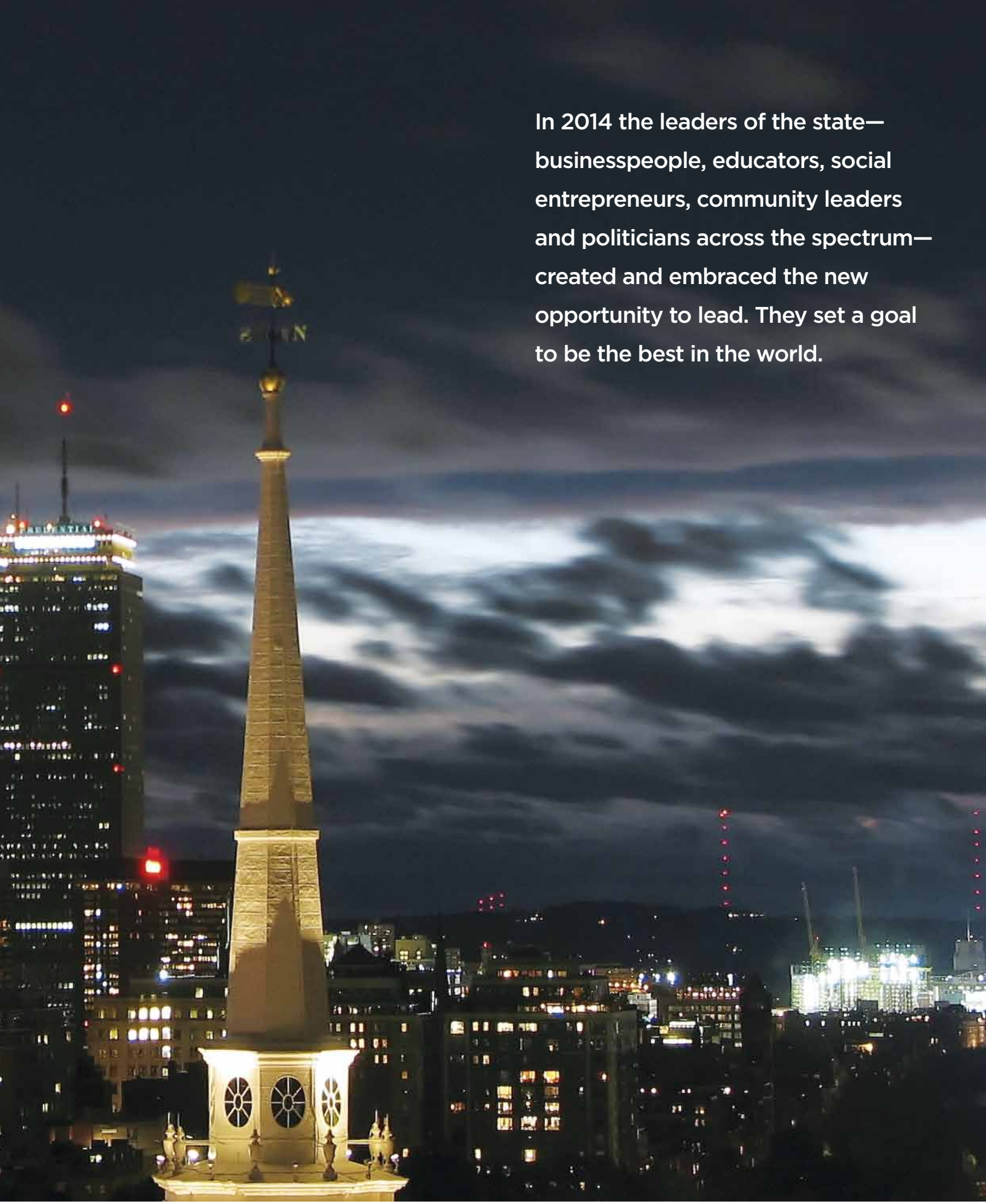
But Massachusetts also has the opportunity to lead the nation and the world by 2030 by taking steps that will, in Barber's words, "unleash greatness." Over the next year, MBAE will devote itself to building support for a transformation of public education based on these steps and we invite you to join us in seizing The New Opportunity to Lead.

Henry C. Dinger, Chairman
Massachusetts Business Alliance for Education
March 2014

PROLOGUE:

MASSACHUSETTS 2030





In 2014 the leaders of the state—businesspeople, educators, social entrepreneurs, community leaders and politicians across the spectrum—created and embraced the new opportunity to lead. They set a goal to be the best in the world.

The company executives' open plan space on the 36th floor had spectacular views over Boston harbor, with Bunker Hill, the crucible of American independence, to the north. She'd been HR Director for just over a year when the founder dropped the bombshell that he was stepping back from a frontline role. It wasn't totally unexpected – after all he was in his eighties now – but even so, it was a big moment. Now, as she looked out over the harbor, she reflected on the conversation they had just had.

He had spoken of the struggle he'd had in the early days, twenty years ago now, to find qualified people. Engineers had been in desperately short supply. The graduates from Massachusetts he interviewed for trainee management posts had rarely shown evidence of the skills he wanted – they could do math but not solve problems; they could use Google to search the internet, but lacked judgment; they worked hard but could not collaborate; they could think academically but not deliberate; they could absorb information but showed little creativity. Too often they also lacked that optimistic, can-do attitude – ironically so deeply associated with America - that would see them through the inevitable challenges; it was as if they were waiting for someone else to take responsibility. And when he tried recruiting straight from high schools, with a view to training future talent himself, he had found it much tougher than expected. Of course there was the occasional bright spark, but too often he found that the treadmill of school had not prepared the young people for the world that was coming. They had some knowledge and skills, but rarely demonstrated mastery.

Unlike many people stepping back after a long career, he did not hark back to some golden age, lost in the mists of time. On the contrary, he agreed with her when she said that things were totally different now. As she had pointed out, now when they recruited, the students from Massachusetts often stood head and shoulders above others in attitude, skills and knowledge. This was as true for students of color and from lower income backgrounds as for everyone else – the once infamous achievement gap, if not totally closed, was much less in evidence.

The real challenge now, they agreed, was to persuade talented young people to join a large corporation when so many of them were starting their own companies or choosing the glamour of a slimmed-down but mightily effective public service. Meanwhile, companies from other states, seeing the success of Massachusetts, often set out to lure its talent away (perhaps to places that were warmer in the winter). Still, as the founder pointed out, enviable employees were a nice problem to have! In any case, they also had on their side the loyalty that the Commonwealth inspired in its young citizens, most of whom knew only too well that not every state, still less every country, had brought about the dramatic transformation of a school system from which they had so evidently benefitted.

The founder, who had spent his entire career in the state, put the change down to a single moment; a decision in 2014 or 2015 (he couldn't quite remember which), to reject complacency and embrace transformation. He described a decisive meeting at which several voices had been raised in support of incremental change: "After all," they were saying, "we're the best performing state in America and the

last few years have been tough." But, in response, a group of business and political leaders, supported by civil rights activists appalled at the wide achievement gaps, had argued the opposite case: "We can do so much better!" Of course, this recollection was a simplification, but the truth was that, thanks to the determination of that second group, the following decade saw the education transformation, so often promised in the past, actually occur.

For sure there were moments when the degree of change in the school system was disruptive for students, not to mention teachers, as the HR Director remembered from her own school days, but the staggering transformation in the learning outcomes for students across the state more than made up for that. In the 2020s, the impact of the education revolution was the talk of families and communities across the state. Successive candidates for governor found that there was no chance of winning the race without getting behind the transformation.

Citizens entering adulthood in 2030 were quite simply much better prepared for the 21st century. They were more literate and numerate than any previous American generation. International comparisons showed them matching or exceeding the performance of the best Asian or European systems. They had a thorough grounding in science, technology, engineering and math. Many more now had the hands-on technology competence that employers had long craved. Some were providing the pipeline of qualified scientific researchers that the great universities of the Commonwealth demanded; all could engage in thoughtful discussion of the social and ethical implications of the genetic engineering and biotechnology that were transforming the world around them.

They had a good grasp of the meaning of America – its history, its values, its responsibilities. More than that, they had a global perspective; they saw America in the context of a dramatically changing world. They could pick out on a world map the locations both of contemporary conflicts and of those long since resolved, such as Iraq and Afghanistan, both popular honeymoon destinations in 2030. Every high school graduate could speak at least one foreign language fluently (Chinese was the most favored), and some could speak more.

Crucially they also had developed the capacity to read, write, think, imagine, communicate and collaborate in ways that made them great employees and active citizens of their communities. This was because the curriculum they had experienced had fully incorporated what Michael Fullan, the Canadian education expert of the time, had called the six 'C's:

1. Character
2. Citizenship
3. Communication
4. Critical thinking and problem solving
5. Collaboration
6. Creativity and imagination

Perhaps most importantly of all, they saw that, in the new world, there was no alternative to taking personal responsibility. They understood that you could no longer wait for someone to provide you with an education or an entitlement; you had to take the initiative yourself. Increasingly, this applied to employment too. Many young adults no longer waited to find a job; they created one, or perhaps many. In short, everyone emerged from high school able to think and act like an entrepreneur or an innovator. In New York Times columnist Tom Friedman's phrase, everyone knew they had to be a "creative creator."

A stream of visitors from overseas visited Boston and other parts of Massachusetts to try to unlock the secret of its success. What they found in the schools was totally different from what they would have seen at the turn of the millennium. Certainly there were parts of a learning day when a teacher lectured from the front of a class, but often this teacher, a deep expert and great presenter, was on a screen and there were hundreds of students watching. In the room with the students were their support team, a combination of trained teachers and learning assistants led by a master teacher. This team knew each student personally, their strengths, needs and ambitions, the progress they had made and the tailored program they were pursuing.

This was just part of the school day of course; much of the time the students were in small groups or working independently; and each day they had a one-to-one review of progress with a member of the support team. Much of the work they did was online, and feedback to the students was instantaneous. Each student's output was visible continuously, not just to themselves, but also to the relevant teachers. Parents too could see in real time what their children were doing, or were supposed to be doing! When a student struggled with a sequence of learning – the initial phase of calculus, say – the teacher could offer precise advice because the learning management system instantly identified how numerous other learners around the state (and beyond), with similar demographic and learner characteristics, had managed to master this sequence. The teacher's task, therefore, was as much about inspiring and encouraging the student to overcome any barriers to progress as it was about telling them how to do it.

> As a consequence, Massachusetts had become both economically and socially the envy of the world.

For both teachers and students, the experience of the school day was no longer a treadmill. Every day was different. Much of the time students worked collaboratively on challenging problems that they had played a part in selecting. The teachers knew that globally benchmarked standards in math and ELA were built into the students' learning experience; but from the students' perspective, achieving those standards was often a by-product of solving problems they cared passionately about. When they came and went through the school building complex, they passed design studios and coffee shops as

well as the state-of-the-art drama and sports facilities. Once home, students were able to keep learning, perhaps collaborating online on this week's problem-solving exercise; and always be in touch with their virtual global network, which ensured each student had a friendship group that included at least three other students on two other continents.

Back in 2014, the education system had been very good by global standards, but not even the system's most enthusiastic advocates at the time believed that the motivation of every student and teacher had been unlocked. Far from it. Many were working hard but living daily with the gap between what was and what might be. Finding the key to this untapped potential had been the key to the transformation.

How had this been brought about? It's a long story, but essentially it was due to one thing: in 2014 the leaders of the state – businesspeople, educators, social entrepreneurs, community leaders and politicians across the spectrum – had created and embraced the new opportunity to lead. They had set a goal to be the best in the world. No qualifications, no excuses. They had opened a conversation about what being the best in the world would mean in practice, and this inspired debate across the state. They had leapt beyond the tedious debates of the day – autonomy or accountability, teachers or technology, the basics or a broad curriculum, planning or choice, to name a few – and realized that, as one of them put it at the time, "the road to hell in education is paved with false dichotomies." In Robert Frost's phrase they had been bold enough "to go by contraries…" They had combined these apparently competing features into an entirely redesigned system.

They had freed schools to drive their own destiny, and radically reformed the teaching profession to make it much more attractive and rewarding. Finally, they set in motion a virtuous circle of innovation, performance enhancement and further innovation, which over time solved problems that back in 2014 they hadn't even known they faced.

At the time they made these proposals, many influential people, plausibly perhaps, said that these leaders had overdosed on ambition; had become delusional even – why, these critics said, would you think so much progress was possible in such a short space of time, given the frustrating history of education reform in the US and around the world? It would be misleading to say that none of the state's leaders harbored doubts; of course they did. Crucially, though, they looked at the world that was coming and knew that, however difficult or farfetched the agenda they had set might look, it HAD to be done if the future citizens of Massachusetts were to lead fulfilled lives and make the most of the incredible opportunities the 21st century offered. It had to be done. They would find a way.

The HR director, reflectively looking out over the harbor, was glad to have worked, if only briefly, for such an inspiring leader as the founder had been. More importantly still, she was glad to have benefitted from the school system that, back then, he and others had willed into being. In the words of Helen Keller, "While [others] were saying among themselves 'It can't be done', it was done." ◆

CHAPTER 1

THE CHALLENGE AHEAD

THE NEW OPPORTUNITY TO LEAD

This is the vision that the **Massachusetts Business Alliance for Education (MBAE)** advocates for the Commonwealth of Massachusetts. In preparing this report, the MBAE asked us explicitly what it would take for Massachusetts to have the best-performing system in the world within 20 years. In the field of public education, Massachusetts has often – sometimes spectacularly – led before. By creating the best education in the world, it would undoubtedly do so again and provide better opportunities for all its citizens.

John Winthrop, the first governor of the Massachusetts Bay colony, left England determined to establish "a shining city on a hill". From the start, education was at the heart of the inspiring vision. The first public school in the American colonies, Boston Latin School, was founded in 1635. Harvard was founded in 1636. Winthrop secured the passage of legislation requiring parents to educate their children because he believed a moral society would not be possible otherwise. As early as 1647, towns in Massachusetts were required to establish tax-supported school systems. More American firsts followed – the first board of education, the first compulsory school attendance law and the first training school for teachers.

In the 19th century, Massachusetts led the nation again. Born in the first decade of the young Republic, in Franklin, Massachusetts, Horace Mann went on to become known as the father of American public education. Determined to promote the Christian ethics in which he firmly believed, Mann became a powerful advocate of public education and, in 1837, the first Massachusetts Secretary of Education. If the adult citizens could not be changed – they were "cast-iron", he said – the children could, because they were "wax". He pursued his case, often against vigorous opposition, and in 1852 Massachusetts became the first state to introduce compulsory education.[1]

In the late 20th century, Massachusetts led the nation again. The 1993 Education Reform Act – based substantially on proposals advocated by the young MBAE – was the most comprehensive exemplar in the US of standards-based reforms. While others talked, the Commonwealth acted. A radical reform of the funding system for education provided for equitable distribution of resources so that all districts, whatever their property wealth, could provide a quality education for their students. In return, the new accountability system, including statewide Massachusetts

> However, while the education system in Massachusetts might not be broken, it is certainly not equipped to meet the needs of the 21st century.

Comprehensive Assessment System (MCAS) tests, was established, both to set high standards and to ensure student outcomes in return for the additional funding the State invested. As a result of these reforms, Massachusetts became America's top-performing state in the National Assessment of Education Progress (NAEP) – the only nationally recognized benchmark of student performance.

In 2010, Massachusetts once again led the country, becoming one of only a dozen states to win Race To The Top funding from the federal government. This involved, among other things, adopting new Curriculum Frameworks that encompassed the Common Core State Standards, improving data systems and strengthening teacher effectiveness. Arguably, no other state can match Massachusetts' track record of leadership in public education. And the results are there for all to see.

Another feature of Massachusetts' success over the past two decades has been the continuity in the state's education agenda and leadership from across the political spectrum. While other states have changed course regularly with a change of administration, the Commonwealth has maintained a commitment to the reforms set in motion in 1993 through changes in executive and legislative leadership. In part this is thanks to the independence which the State Board of Elementary and Secondary Education enjoys from the Governor, and this has enabled three successive Commissioners of Education to provide continued leadership to the reform efforts.

The results of this continued commitment to improvement are clear. In NAEP in 2013, Massachusetts was first, or tied for first, in both 4th grade and 8th grade reading and math. Moreover, between 1992 and 2011, on the basis of comparisons between NAEP results, Massachusetts was the fourth most improved state in the union behind only Maryland, Delaware and Florida.[2] Not only that, the percentage going to college has improved dramatically over the same period, from 59% in 1992[3] to nearly 75% in 2011[4]. In other words, the improvement registered by MCAS is confirmed by data sources entirely independent of the state authorities.

International benchmarks reinforce the leading position of Massachusetts. In the 2012 Programme for International Student Assessments (PISA), run by the OECD to test reading, math and science competency in 15 year olds, the state's students on average performed very well. In reading, only three other education systems, Shanghai, Hong Kong and Singapore, were statistically ahead of Massachusetts. Massachusetts students have also performed very well on other international tests including the Trends in International Mathematics and Science Study (TIMSS).

Given this undoubted success, in which the state and the educators can surely take pride, some have suggested to us in our consultations that there is no need for the state to seek a new opportunity to lead. We're doing well, they tell us, and it's been hard work. The problem is too much change, not lack of it. Steady as she goes. If it ain't broke, don't fix it.

However, while the education system in Massachusetts might not be broken, it is certainly not equipped to meet the needs of the 21st century. Although results in PISA for reading were impressive, Massachusetts is only in joint 10th place in math and a long way behind the top performers. Moreover the top performing systems are striving constantly to improve and some, as the recent PISA results show, are making spectacular progress even from a base which is already higher than Massachusetts. We believe that for Massachusetts to stand still now would be a major strategic error. Complacency may well be the biggest threat because, under the surface of the undoubtedly positive story, we see some profound challenges facing Massachusetts – and the US as a whole – which need to be surmounted if the promise of the 21st century is to be fulfilled.

There is a further caution against complacency for Massachusetts from another country which has performed

> Massachusetts must avoid this threat of complacency by grasping the new opportunity to lead with both hands and show the way, not just for the state itself, but for the country and even the rest of the world. We must see the successes of the past 20 years as a foundation on which to build, not as a place to rest. Why pause on what writer Joshua Foer calls the "OK plateau" when the "excellence summit" is within view?

well on PISA in the past. When the first PISA results were released in 2001, Finland topped the table in reading and was in fourth place in science and fifth place for mathematics. In the most recent results for 2012, Finland had fallen to sixth place in reading, fifth place in science and twelfth place for mathematics. Reflecting on what had happened in Finland since 2000, Pasi Sahlberg, a former Director General at the Finnish Ministry of Education and Culture and now visiting professor at Harvard University's Graduate School of Education, has commented:

"Finland had done very little to improve students' mathematics performance since the first PISA results had come in 12 years ago. Many of us had pointed out that other countries with high PISA scores had continued to improve their systems, but Finland did not do that. All change in Finland, both good and bad, came to an end, and we lost our capacity to renew and adapt to a changing environment.[5]"

HEADLINES FROM the MBAE survey of Massachusetts employers

- 69% of business leaders surveyed said they found it somewhat or very difficult to find people with the right skills for the positions they need to fill.
- Business leaders perceive a disconnect between what is being taught and the applied skills students need, giving better overall grades to the K-12 system (46% grade it A or B) than they do for its effectiveness in preparing young people for jobs (20% grade it A or B).
- A majority of business leaders say the school system needs to make some moderate changes (52%) or has serious problems and is in need of a major overhaul (32%).

The survey also highlighted employer views about how the education system needs to change:

"Standards based accountability has worked over the last 20 years. Now we need to focus on building student-centered education, with more technology to enable personalization and more experiences to consolidate learning and 'make it relevant' to kids."

"We must figure out how to address the achievement gap for our urban students who are being failed by the public education system in large numbers."

"The focus on testing this past decade has threatened the focus on creating lifelong learners and in some instances has dumbed down the curriculum. Differentiated instruction that challenges all students to stretch themselves academically is needed to compete with the rest of the world."

"Public schools aren't spending enough time teaching kids to problem-solve, think, and work with others collaboratively. They spend too much time having kids memorize facts and figures – and they are too focused on checking off the boxes they have delivered to the curriculum."

Six Gaps:
The Challenges Facing Massachusetts

1 THE EMPLOYABILITY GAP

The gap between what the economy demands and what the school system produces

In 2012, the Prime Minister of Singapore, a country with one of the highest performing education systems in the world, said:

> *"...no education system can remain static. The world is changing rapidly. Technology is transforming our lives. The skills needed in the future will be very different from those needed today … Education is therefore a top national imperative, and a key factor in our success."*

Some of those we spoke to in our consultations dismissed these insights as irrelevant to Massachusetts. We disagree. After all, while Massachusetts may not be a city-state like some of the other high performing education systems, it is not a large country blessed with natural resources, low energy costs, or other obvious advantages that will sustain its economy against national and global competition. For Massachusetts to thrive in the new global economy it will have to rely on well-educated and entrepreneurial citizens attracting inward investment and producing high-tech value.

Business leaders in the US repeatedly make an argument similar to Prime Minister Lee's. The Business Roundtable, which represents the chief executives of many of the leading companies in the US, could not be more explicit in its recent report.[6]

> *"…by many measures, the United States is failing to develop the talent that US businesses need to compete in the modern global economy. For instance … more than* ***95% of CEOs indicated that their companies suffer from skills shortages.*** *… in the broader US labor market … there are more than 3.9 million US job openings, yet more than 11 million US workers remain unemployed."*

That is a devastating statistic that represents not just lost production, but also human misery. The problem is as vivid in Massachusetts as it is across the rest of America.

The MBAE, with the support of other business organizations, undertook its own survey[7] of business leaders in fall 2013. It makes sobering reading and highlights the skills gaps many employers say they face, as the box on the previous page makes clear.

The evidence produced by the Georgetown University Center on Education and the Workforce illustrates another challenge.[8] By 2020, 72% of all jobs in the Commonwealth will require some form of post-secondary education, the fourth highest percentage among all states.

There are simply fewer jobs available to those who don't complete their education. Moreover, the jobs that don't require a post-secondary education are much more likely to be low-paid and temporary, and therefore insufficient to support the kind of families and society to which American citizens rightly aspire. This is illustrated by the number of Massachusetts workers who are

currently under-employed – defined as people who are working part-time (under 35 hours a week), but want to work full-time. As Andrew Sum and colleagues from the Center for Labor Market Studies at Northeastern University[9] have shown, "problems of underemployment among Massachusetts workers have risen substantially in recent years and have nearly tripled since 2000". The problem was worst for low income workers who lacked a high school diploma or General Education Development (GED) credit, with an underemployment rate of 25%.

The employability gap affects major public employers as well as businesses. A recent report[10] for the Council on Foreign Relations, prepared by co-chairs Condoleeza Rice and Joel Klein, points to the threat to US national security posed by the challenges of recruitment to the military. As many as 75% of 17-24 year olds were judged unsuitable to join the military because they were physically unfit, had a criminal record or had inadequate levels of education.

The employability gap is not just about what employers want; it is also about providing students with the skills, knowledge and attitudes to create jobs as well as fill them – indeed it has often been referred to as the Skills Gap. Massachusetts is, after all, home to one of the biggest concentrations of innovation and entrepreneurialism in the world – any successful future for the state must see this sector of the economy grow. If citizens are to both benefit from and fuel this trend, then young people need to graduate with a startup mentality. As authors Hoffman and Casnocha put it:

> *"What's required now is an entrepreneurial mindset. Whether you work for a ten-person company, a giant corporation, a not-for-profit, a government agency or any type of organisation in between – if you want to seize the new opportunities and meet the challenges of today's fractured career landscapes, you need to think and act like you are running a startup: your career.[11]"*

It is clear, then, that the education system needs to change radically if the future citizens of Massachusetts are to meet the employability challenges of the new economy.

2 THE KNOWLEDGE GAP

The gap between what a 21st century American needs to know and what graduates of the school system actually know

It is not unusual in educational discourse these days to hear people assert that, because we have the internet, knowledge is ubiquitous and therefore no longer something the school system needs to worry about. This is absurd.

The modern world requires not only that students have more knowledge than ever, but also that they can apply that knowledge in a variety of practical circumstances. In this sense, knowledge, understanding and skills are three strands of one plait – and this combination cannot easily be Googled. As psychologist Daniel Willingham has said:[12]

> *"Data from the last thirty years leads to a conclusion that is not scientifically challengeable: thinking well requires knowing facts. The very processes that teachers value most – critical thinking processes, such as reasoning and problem-solving – are intimately intertwined with factual knowledge that is stored in the long-term memory."*

It is clear that students in early 21st century America need to learn math and English language arts to high standards. The new Massachusetts Curriculum Frameworks, if assessed effectively, represent an important step forward for Massachusetts, as does the Common Core for the US as a whole. For the first time, students, teachers, parents and

> For the first time, students, teachers, parents and employers can have confidence that students who master new college and career-ready standards will match their peers around the world.

employers can have confidence that students who master new college and career-ready standards will match their peers around the world. As the Business Roundtable puts it, the Common Core is "a potential game-changer".

In its recent report, the Council on Foreign Relations argues that over and above these vital areas of knowledge, students need to "acquire foreign languages, learn about the world, and – importantly – understand America's core institutions and values in order to be engaged in the community and in the international system."

It is over 25 years since E. D. Hirsch first put cultural literacy at the heart of the education debate in the United States. He made a strong case that there was a core of knowledge across, for example, history and literature, to which every young American should have access. Even if some would not follow him all the way to his rigorous conclusions, most would recognize the challenge he posed as legitimate. These aspirations are surely shared by the vast majority of Americans. Most would go further still, no doubt, and argue that music, art, drama, sport and games should all be part of a rich educational offering too. We will come to what the curriculum might look like in Chapter 2, but suffice to say there is currently a huge gap between what Americans want their children to know and what they are in fact learning.

In math and English language arts, the gaps are well known and have been revealed again and again in international comparisons. The same is true in science and the other STEM subjects. To give just two pieces of supporting evidence here, according to the Business Roundtable report, "more than half of high school graduates are not prepared for college-level math, and 69% of high school graduates are not prepared for college-level science."

This has consequences at the college level: as the Council for Foreign Relations notes, "less than a third of American students graduate with a first university degree in any science or engineering field … At graduate level, about one third of science and engineering students are foreign nationals."

In Massachusetts, these knowledge gaps are also creating a college readiness gap. This is clearly illustrated by the fact that nearly 40% of students are enrolled in at least one developmental (remedial) course in public colleges, despite the fact that 80% of students achieved proficiency in mathematics and 91% in English language arts in grade 10 MCAS tests.[13]

As for knowledge of the world and America's place, the Council on Foreign Relations report is equally damning:

> *"In civics, about a quarter of students are proficient or better on the National Assessment of Educational Progress (NAEP). This leaves most twelfth graders unable to describe how laws are passed, unfamiliar with landmark Supreme Court decisions and unsure of the functions of the US Constitution or the Bill of Rights."*

Furthermore, they add:

> *"Not only do American children know little about their own country, they also cannot understand or communicate with their global peers. Largely as a result of immigration, nearly 400 languages are spoken within the United States. However, roughly eight in ten Americans speak only English, and a decreasing number of schools are teaching foreign languages."*

In Massachusetts, the minimum expected program of study for college and careers readiness is defined by MassCore.[14] This includes four years of English, four years of math, three years of a lab-based science, three years of history, two years of the same foreign language, one year of an arts program, five additional 'core' courses such as business education, health, and/or technology, and additional learning opportunities including AP classes, dual enrollment, a senior project, online courses for high school or college credit, and service or work-based learning. Massachusetts has only recently started to collect its own data on completion of MassCore; previous statewide data was based on self-reported data from districts. Massachusetts will now be able to monitor more closely how many students are being offered, and how many complete, the necessary breadth and range of subjects and experiences they need.

> In Massachusetts, these knowledge gaps are also creating a college readiness gap.

Overall, while Massachusetts might be doing better on average than the rest of the United States, the trends are not encouraging, and the state's knowledge gap is clearly larger than any of its employers or citizens would want.

3 THE ACHIEVEMENT GAP

The gap in achievement between Massachusetts students as a whole and those from economically disadvantaged and under-represented minorities

The philosophical basis of public education in large part rests on a deep commitment to provide all young people, whatever their background, with the same opportunities for success. As we acknowledge, Massachusetts has made outstanding progress since the 1993 Education Reform Act in improving overall performance. The state's educators and leaders acknowledge, however, that over that period there has been less success in narrowing racial and socio-economic achievement gaps. Other states, notably Florida and Texas, whose overall performance is below that of Massachusetts, have done significantly better at narrowing gaps while also improving overall performance. The facts in Massachusetts remain stark. Looking at 2013 results[15]:

- In MCAS White students are still twice as likely as Hispanic and African American/Black students to achieve proficiency in Math and Science.
- Although AP enrollment has increased for all subgroups over the last 5 years, the gap persists between all students and African American/Black and Hispanic students.
- The College Attendance Gap has narrowed for African American/Black students but persists for Hispanic students.

Those who have led the Massachusetts public school system, from Horace Mann onwards, would surely be disappointed by this failure to close these achievement gaps. The issue is both moral – as Horace Mann put it, citizens cannot maintain both ignorance and freedom – and economic. School failure has economic consequences (in lifetime earnings) for the individual and for the state as a whole.

Any strategy for the next 20 years needs to have closing the Achievement Gap firmly at its heart.

4 THE OPPORTUNITY GAP

The gap in opportunity to succeed between the children of the well-off and the children of low income families

The phrase 'opportunity gap' is used in a variety of ways in the US education debate, which is why we have given it a precise definition. The US has seen a growing gap in wealth between the most wealthy and the least over the past 30 years. "From 1960 to 1980, the top 1% [of the income distribution] steadily earned about 10% of all income … by 2007 it had increased to nearly 25%," argues Stein Ringen, the Yale political scientist in his recent book, Nation of Devils. "In 2010," he adds, "the top 1% captured 93% of the income gains". As he points out, The Financial Times bluntly headlined this news as "The American Dream Unravels".[16] In short, if the opportunity gap persists, the promise at the heart of the idea of America is threatened.

Those who have led the Massachusetts public school system, from Horace Mann onwards, would surely be disappointed by this failure to close these achievement gaps.

The classic defense of inequality in the US is that there is always the promise of greater social mobility. This is indeed what fuels the American Dream. The facts, however, tell a very different story – there is not only a widening income gap, but also a widening opportunity gap. In fact, the evidence suggests that social mobility in the US is now lower than that in Canada, Scandinavia, Germany and France. We might call this the Social Mobility Gap, and the figures for Massachusetts suggest

that it exists in both employment and education outcomes:

- "The least well educated workers in Massachusetts (those with no high school diploma or GED) are six times more likely to be unemployed than the best educated workers (those with a Masters, PhD or professional degree)."[17]
- Although MCAS proficiency gaps for low income students have been narrowing over the past five years, scores for low income students remain more than 20 percentage points below scores for all students.
- The enrollment gap for Advanced Placement courses has grown over the past five years.
- Low-income students' college attendance rates have improved over the past five years, but continue to lag well behind those for all students.[18]

The opportunity gap cannot be solved purely through education, but education clearly has a vital part to play. First, by improving quality and consistency across the state and, second, in as far as possible, by offering families on low incomes the same opportunities to exercise choice and to access high-quality education as those with higher incomes have as a matter of course. Narrowing the opportunity gap will also involve looking at access to education outside the school day – at home in the evening, in communities and during vacations. But, however much the schools improve, unequal distribution of social capital remains, and students from low income families are likely to have less access to a wide range of opportunities outside of school than their peers from higher income households. Given the core belief of educators across the state in the American Dream, Massachusetts should strive to do everything it can to address this out-of-school opportunity gap.

5 THE GLOBAL GAP

The gap between the performance of Massachusetts' education system and those in the top-performing education systems in the world

At an international level, at first glance Massachusetts appears to perform quite well and certainly much better than the US as a whole. This is shown in the recently published 2012 results from the OECD's Programme for International Student Assessments (PISA), which tests 15-year-olds' competencies in reading, math and science. Massachusetts is in joint fourth place for reading, behind only Shanghai, Hong Kong and Singapore. In math, Massachusetts' performance is lower, coming in joint tenth place. The US overall is 20th for reading and 36th for math. However, a closer look at the international comparisons reveals that although Massachusetts is behind only a relatively small number of other education systems, it is a long way behind the performance of these education systems. In math, for example, Massachusetts is nearly 99 points below the top performer, Shanghai, over 59 points below Singapore and 22 points below Japan.

Some have argued that differences in PISA are due to different population types, since these education systems have more homogenous populations and less poverty to deal with. However, as Eric Hanushek, Paul E. Peterson and Ludger Woessmann argue in Endangering Prosperity: A Global View of the American School, we can eliminate some of these differences by looking at the performance of only the most advantaged students. They take students with at least one parent who is college-educated as a proxy measure for students who might be expected to have some educational advantages in life. This comparison (based on an earlier analysis of the 2011 NAEP results and the 2009 PISA tests) reveals that only 61% of Massachusetts' most advantaged students are proficient in math – less than the total for all students in Hong Kong and Singapore.

As Hanushek, Peterson and Woessmann state:

> *"The news is sobering. Some might try to comfort themselves by saying the problem is limited to students from immigrant families, or to African American students, who have suffered racial discrimination, or to others who have suffered from ethnic discrimination. But not even half of the students from college-educated families [in the US] were proficient in mathematics. And children of college-educated parents in our best state, Massachusetts, still trailed all students in Hong Kong and Singapore."*

It is clear, therefore, that although Massachusetts performs relatively well in these international comparisons, it would need to improve rapidly to match or overtake the best in the world who, as the 2012 PISA data shows, are themselves still improving.

THE TOP TALENT GAP

The gap between top-performing students in Massachusetts and top-performing students in the best-performing education systems in the world

The international evidence also shows that Massachusetts has a challenge at the top end of performance. The latest PISA data shows that the top performer in math, Shanghai, has nearly three times as many students achieving the highest levels of performance on PISA than Massachusetts does. Advanced performance in math matters because we know it is critical to future economic success.[19]

Very little education policy in the state has focused on the top of the performance spectrum, perhaps understandably given the admirable moral fervor around the achievement gap, but unless it is addressed, Massachusetts will not match the best in the world or provide the economy with the talent it increasingly demands. Massachusetts needs a clear and deliberate strategy aimed at increasing opportunities to stretch the top performing students in the state.

The latest PISA data shows that the top performer in math, Shanghai, has nearly three times as many students achieving the highest levels of performance on PISA than Massachusetts does.

Six Gaps

...and a plateau?

It could be argued perhaps that these six gaps would not be quite such a major problem if the education system in Massachusetts was continuing to make rapid progress in improving overall performance and narrowing gaps. Unfortunately, recent data suggests there has been a deceleration in the rate of improvement and Massachusetts has not kept pace with the rate of improvement seen in other countries. In part this slowing down is to be expected, it is more difficult to achieve higher rates of improvement when you are a top performer already, but if the goal is to be the best in the world then any slowing of progress is problematic, especially when the top performers globally continue to improve at a faster rate.

Massachusetts participated in PISA for the first time in 2012, so it is not possible to make a direct comparison between its rate of progress in PISA and those of other top performing education systems, although this will be possible in 2015. However Eric Hanushek, Paul Peterson and Ludger Wossman have undertaken analysis which compares countries' rate of improvement in previous international assessments and the rate of improvement achieved by Massachusetts and other states in NAEP since 1992.[20] These comparisons show that Massachusetts' rate of improvement is well below that of some systems – such as Hong Kong – which are already ahead of it. Moreover, as the PISA 2012 results showed, some of those top-performing countries are very substantially ahead. Add to that the fact that some systems, whose overall performance is already close to Massachusetts, such as Poland and Germany, have achieved a faster rate of improvement, and the picture suggests that without further acceleration Massachusetts can at best expect to stand still in rank order.

The 2013 NAEP results, published in November, added to the sense that progress is stalling, especially in relation to 4th grade reading where Massachusetts' performance slipped a little in the past two years, one of only 13 states to fall back, and the only Race To The Top winner to do so. The ten-year trend between 2003 and 2013 shows that Massachusetts is in the middle of the pack, in 17th place for improvement in 4th grade reading for all students (though only four of the higher-placed states have a statistically significantly higher rate of improvement) and in 31st place for the improvement in 4th grade reading for low income students (with eight states having a statistically significant higher rate of improvement than Massachusetts). The picture is more positive for 4th grade math and 8th grade math and reading, with improvements in all three measures between 2009 and 2013, but even for these measures Massachusetts rate of improvement is well below that of a number of other states.

The 2013 NAEP results, published in November, added to the sense that progress is stalling, especially in relation to 4th grade reading.

Of course, there are other indicators which point to impressive ongoing improvement in Massachusetts. In other international comparisons such as TIMSS, which Massachusetts has participated in three times over the last 15 years, Massachusetts' rate of improvement from 1999 to 2011 (the most recent administration of the assessments)

was the highest of any participating entity in grade 8 mathematics and the second highest in grade 8 science. And Massachusetts' own data shows the grade 10 MCAS results have improved consistently over the last 10 years, as has the four year graduation rate and annual drop-out rate, which has declined consecutively for five years in a row.

Our argument is not to deny the many areas where Massachusetts continues to achieve impressive results, but simply to ask whether the rate of improvement is sufficient to enable Massachusetts to sustain its position as a global leader and meet the challenges students will face in the 21st century. In this respect the PISA-NAEP comparisons of progress and recent NAEP data suggests that Massachusetts certainly has more to do.

We are now able to summarize the current state of the Massachusetts school system.

- It is a high-performing system when benchmarked against the US and the rest of the world.
- Nevertheless, it has six significant gaps:
  - — *The Employability Gap*
  - — *The Knowledge Gap*
  - — *The Achievement Gap*
  - — *The Opportunity Gap*
  - — *The Global Gap*
  - — *The Top Talent Gap*
- Each of these needs to be vigorously addressed to ensure the future citizens of Massachusetts lead fulfilled lives in the 21st century.
- The rate of improvement of Massachusetts' education system shows signs of slowing and is behind that of other top performing systems globally.
- If the MBAE's aspiration of the Commonwealth having the best school system in the world within 20 years is to be achieved, something significant will have to change.

The rest of this report sets out what we believe those changes need to be. In the meantime, in the final section of this introductory chapter, we summarize the central themes.

Whole System Reform + Systemic Innovation + Effective Implementation

Over the past 20 years, a great deal has been learned about how to reform education systems successfully. This knowledge about how to reform whole systems (as opposed to introducing a series of 'initiatives') has huge potential. The difficulty is not in understanding what needs to be done, but in actually getting it done, given that successful whole-system reform involves radical change to structures, processes and cultures which are notoriously hard to change. The Russian Prime Minister who resigned saying "we tried to do better but everything turned out as usual" would find many sympathizers among education reformers in the US and elsewhere.

In this report, we build on the argument Michael and colleagues previously set out in *Oceans of Innovation*,[21] and argue there will be three elements to driving the change necessary to make Massachusetts the most successful school system in the world.

1. Apply the whole-system reform change knowledge

At the school level, this knowledge is set out in three major reports: McKinsey's 2007 *How the World's Best-Performing School Systems Come Out on Top*, McKinsey's 2010 *How the World's Best School Systems Keep Getting Better* and Marc Tucker's 2011 book, *Surpassing Shanghai, An Agenda for American Education Built on the World's Leading Systems*. The messages of all three reports is summarized in the table below.

The fundamental messages are: set high standards; develop ways to measure the extent to which those standards are met; constantly monitor whether they are being achieved; provide excellent teachers who improve their teaching throughout their careers; ensure well-trained, well-selected principals in every school; and then reorganize the whole system from the Department of Education to districts so that all parts become dynamic drivers of change rather than remaining static bureaucracies – drivers of quality rather than enforcers of compliance.

STANDARDS AND ACCOUNTABILITY	HUMAN CAPITAL	STRUCTURE AND ORGANIZATION
Globally benchmarked standards	Recruit great people and train them well	Effective, enabling central department and agencies
Good, transparent data and accountability	Continuous improvement of pedagogical skills and knowledge	Capacity to manage change and engage communities at every level
Every child on the agenda always, in order to challenge inequality	Great leadership at school level	Operational responsibility and budgets significantly devolved to school level

Massachusetts has already delivered – or is in the process of delivering – on many of these elements of whole system reform, especially in relation to standards. It arguably has more to do in relation to the other key elements. In all respects, there is a greater need to focus on the rigorous implementation of these proven system reforms throughout the education system.

> ...whole-system reform alone will not be enough. We need to find ways to integrate into the system a capacity to innovate continuously.

2. Simultaneously develop a 'systemic innovation' agenda

This second aspect of the agenda would lead to radical insights which would in turn inform the next wave of whole-system reform. If Massachusetts effectively applied all the existing knowledge described above, it would be a great advance, but it would not be enough to meet the challenge of the 21st century. Collectively we don't know yet how to achieve high standards across a broad and deep curriculum for every single student. For this reason, systems also need to become more adept at constantly generating, identifying and scaling innovation and creating a culture which supports this innovation. At present, many systems lack the capacity to innovate, and some public systems actively discourage it.

As Arne Duncan, US Secretary of Education has noted, "the US is still ahead in experimentation … our decentralized system has its pros and cons, but one of the biggest pros is that it can generate great ideas. We have many islands of excellence." However, he went on to express frustration that even the US was not moving fast enough to make the most of this advantage, "We've been far too slow to move in the direction of hybrid learning. The question is… how do we make that standard practice?" If it is to lead the world in the future, Massachusetts has to rise to this challenge and commit its energy and resources to fostering these islands of educational innovation and disseminating it, quickly and systematically, to the field.

In other words, whole-system reform alone will not be enough. We need to find ways to integrate into the system a capacity to innovate continuously. Unfortunately, much of the education reform debate in recent decades has set up whole-system reform and innovation in opposition to each other, with the result that more heat than light has been generated. In fact, the two can and must go together. The key challenge is how to create structures and relationships within systems where information and ideas flow in all directions and leaders at all levels rise above the increasingly sterile debates of recent years.

3. Focus on effective implementation

This means paying as much attention, if not more, to the 'How?' as well as the 'What?' To put it another way, think of implementation as the biggest challenge of all rather than – as in so many reports – an afterthought. Though there is a substantial body of generally accepted knowledge about education reform, most systems have still not applied that knowledge, partly because bringing change across a large system requires consistent and courageous leadership, and partly because implementation is all too often not taken seriously enough. There are many lessons now from around the world about how to deliver large-scale reforms to public services. A number of countries have adapted and refined the approach developed by Michael Barber in the Prime Minister's Delivery Unit (PMDU) in the UK, and have demonstrated real progress. Massachusetts itself – along with more than a dozen state education systems in the US – has also adopted this proven approach over the past three years[22].

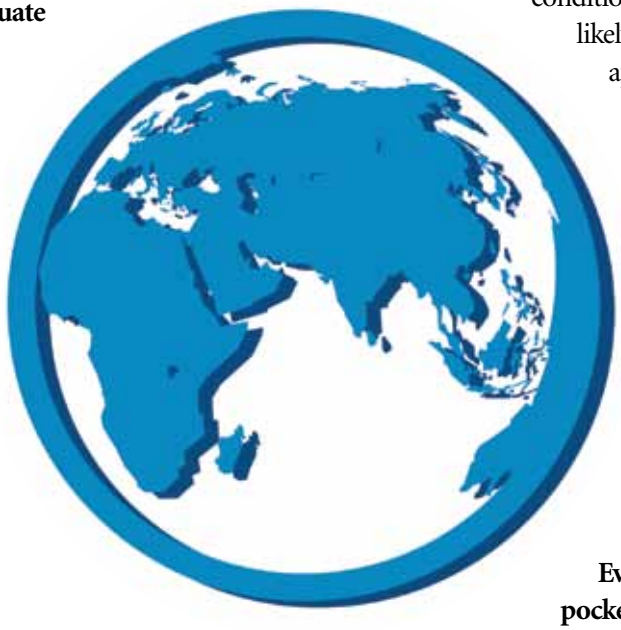
We describe the combination of these three approaches – whole-system reform plus systematic innovation plus effective implementation – as whole-system transformation. A system that achieved this combination would be designed to match the best in the world and have the capacity to keep getting better. No large education system in the world, to our knowledge, has put all three elements together over a sustained period. The first one that does will surely not just improve faster than others; it will generate the capacity to sustain improvement and the resilience to adapt to changes in the external environment. Given its strong platform and the evident ambition of its leaders, maybe Massachusetts could be the first? Surely it should seize this new opportunity to lead.

In the rest of this report we set out how Massachusetts could apply the notion of whole-system transformation to the next phase of reform. This will mean unleashing greatness.

Unleashing Greatness

This is the central insight that should guide the approach to the next phase of reform in Massachusetts. In the 2010 report, *How the World's Best School Systems Keep Getting Better*, Mourshed, Barber, and Chijioke, drawing on Michael's work in the British government, set out four stages of improvement for education systems across the world.

For school systems attempting to move from poor to adequate or adequate to good, the focus is on achieving minimum standards in literacy and math, intervening to challenge low-performing teachers and schools, and getting the foundations in place in terms of accountability, facilities and funding. Massachusetts has already implemented many of the elements of these stages of the improvement journey, both through the original 1993 Act and the subsequent implementation of Race To The Top reforms.



For systems that want to move from good to great or great to excellent, the focus needs to shift to improving the quality both of teachers entering the profession and of existing teachers; cultivating peer-led learning among teachers and principals both within schools and between them; and encouraging experimentation and innovation to discover the future leading practices which might be shared with all schools. School systems that are still working towards 'good' require a strong degree of central direction. This is the 'mandating adequacy' phase. School systems that want to move from good to great or great to excellent have to take a different approach. Rather than mandating adequacy, they need to create the conditions in which great performance is more likely. This requires a more sophisticated approach, in which the system sets the overall strategy, secures the necessary supply of excellent human capital (especially teachers), monitors performance, introduces incentives, learns continuously and steers the system into the future. In this way, it enables schools themselves to take the lead and innovate, with the system enabling schools to rapidly learn from what is working elsewhere. Innovation rarely comes from the top down.

Even within a great system there may be pockets of poor performance, so it is wise for a system to retain the capacity to intervene if necessary. Schools that are given the freedoms to drive their own improvement who don't make adequate progress must face consequences. The ultimate aim however should surely be that the pressure to improve comes from parents, families and citizens rather than from the center of the system. In short, greatness cannot be mandated – the

"You can mandate adequacy, you can't mandate greatness. It has to be unleashed."

English language revolts at this combination of words – it has to be unleashed. As every education leader knows, improving the performance of an education system is never easy whatever its phase of development, but the 'unleashing greatness' phase is conceptually more sophisticated, and globally we have less knowledge of how to make it work. Fundamentally, the challenge is to create circumstances in which the expectation of everyone, students as well as educators, are high and the intrinsic motivation of all those who work and learn in the system is unlocked.

Massachusetts, notwithstanding occasional pockets of failure, is a system in which some parts need to move from good to great, and others from great to excellent. The challenge therefore is to develop a strategy for unleashing greatness rather than mandating adequacy. Of course there are parts of the system where the challenge remains greater, as currently in Lawrence, for example, but the overall approach to reform now needs to shift. This report is explicitly designed to set the agenda for unleashing greatness.

Unleashing greatness is of course much easier said than done, and making a reality of the detailed proposals in this report will not be easy. It will require major cultural change throughout the education system – amongst superintendents, school committees, community leaders, parents, principals, teachers, union leaders, students, state officials – all of whom will need to be committed to the task. As the efforts to transform the performance of the lowest performing schools and districts over the last three years have shown, transforming just one part of the system can be very hard. The same energy and drive shown by the state, districts, schools, public and private partners needs to be brought to bear in continuing to raise performance across the whole education system.

Massachusetts could also learn from the top-performing countries in their long-term approach to reform. Both Singapore and Hong Kong set out a phased approach to reform that was planned and implemented carefully over a period of many years so that reforms built on each other. While this is much more difficult in the combative political culture of the United States, we would argue that a similar phased approach is now needed in Massachusetts.

It will require major cultural change throughout the education system – amongst superintendents, school committees, community leaders, parents, principals, teachers, union leaders, students, state officials – all of whom will need to be committed to the task.

In the first phase, over the next three years, Massachusetts should create the conditions for unleashing greatness. This will include implementing the new curriculum standards and assessments, debating the wider knowledge and skills Massachusetts wants every student to have, devolving

greater freedoms and flexibilities to schools, creating new networks or clusters of schools to support peer-to-peer learning, raising the bar on the quality of teacher preparation and the quality of teachers entering the profession, creating new routes for the best teachers to progress, deploying the best leaders across the system, starting to generate greater innovation through an Accelerated Learning Competition, promoting greater school-community and school-employer partnerships, and looking more closely at the use of resources at a district and school level.

> Once the process of systemic innovation is set in motion, it will take over and lead the system to places unimaginable a few years earlier.

In the second phase of reform to 2020, Massachusetts should start to see the early results from implementing these reforms. Greater personalization of learning, building on new online curriculum materials and assessments, should become the norm. School clusters and partnerships will have become the driving force of progress and innovation from within the school system, teachers will be systematically learning from each other and the best teachers will be deployed across the system. The new Innovation Collaborative will be capturing and sharing the most promising new practices, especially in relation to closing the achievement and opportunity gaps.

It is more difficult for us to predict what the third phase of reform, between 2020 and 2030 will look like. Many of our predictions are likely to be wrong! In 1877, President Rutherford B. Hayes commented famously, "The telephone is a marvellous invention but who on earth would want to use it?" In 1993, the British Broadcasting Corporation published a visionary new, long-term strategy but totally missed the Internet. Rather than specify details, therefore, we have tried instead to describe a process in which the education system in Massachusetts would have the capacity to experiment, learn and apply lessons in a continuous cycle while responding intelligently and nimbly to the inevitable surprises. In this way we hope it would find its way to levels of performance far beyond any current system in the world (as we sketched out in the Prologue).

One thing we are clear about: in this third phase, there should be less system reform and much more systemic innovation. Once the process of systemic innovation is set in motion, it will take over and lead the system to places unimaginable a few years earlier.

In the chapters that follow, we set out our detailed ideas and recommendations in relation to:

- Standards, Curriculum, Assessment and Student Pathways
- The Future Delivery System
- Developing World Class Teachers and Leaders
- Promoting Innovation and Technology
- Closing the Opportunity Gap
- The Future Funding System

In each chapter we present a mix of recommendations that would entail reforms to the current system – **System Reforms** – as well as more radical ideas for how the education system will need to evolve and change in future – **Systemic Innovations**. Underpinning all of our recommendations is a need for Massachusetts to focus on more **Effective Implementation**.

Our task has been to offer a view from outside the system and to be provocative about what the next phases of reform might look like. The process of consultation that the MBAE will lead following the publication of the report is vital to enabling Massachusetts to make the right choices about what comes next, and for building a coalition of political and public support for reform. This coalition of support was a key part of the success of the 1993 Act, and will be critical to successful implementation this time as well. It is also important however that this conversation quickly moves beyond political circles, and leads to much wider public engagement and leadership of the agenda.

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CHAPTER 2

WORLD CLASS STANDARDS, CURRICULUM, ASSESSMENT AND STUDENT PATHWAYS

MASSACHUSETTS SHOULD:

- Prioritize the implementation of the new Massachusetts Curriculum Frameworks and ensure full implementation in all schools and districts by 2016.
- Increase access and achievement of MassCore for all students by incentivizing districts to adopt MassCore as minimum graduation requirements for all students.
- Promote new models of student-centered education by developing and evaluating new demonstration projects at school and district levels.
- Invest in the development of online assessment and simulations so that Massachusetts becomes a global leader in a vital, emerging field.
- Establish a statewide network of provision for enhanced and enriched opportunities for gifted and talented students.

Massachusetts faces both an employability gap and a knowledge gap. The MBAE poll showed that Massachusetts employers believe too many young people are leaving education without the skills they need to succeed in the modern economy. Employers want to see students develop a solid foundation in literacy and math as well as a broader range of the knowledge, skills and dispositions needed to manage their own careers. In this chapter we look at how Massachusetts can strengthen its implementation of reforms to standards, curriculum and assessment to ensure all students develop what is needed for success. We also address the need to expand access to vocational opportunities and new opportunities for top performing students to close the Top Talent Gap.

Massachusetts has already made much progress in developing and implementing the new standards and curriculum frameworks in math, English language arts and literacy which incorporate the Common Core. It is essential that this work remains a top priority to ensure all students reach standards comparable to the best in the world. On its own, however, this will not be sufficient to close the Employability and Knowledge Gaps. Massachusetts also needs to ask more fundamental questions about the broader core knowledge and skills it should expect all students to develop. What should every student graduating from high school in Massachusetts know, understand and be able to do? How can Massachusetts ensure students develop deeper knowledge across the curriculum, including in areas outside the core of math and English? How can it ensure students develop the interdisciplinary skills and competencies that

> What Massachusetts chooses to assess inevitably influences what is taught in schools and how it is taught... the state must develop the capacity to assess a wider range of higher-order knowledge and skills.

employers demand and students need for life in the 21st century? How can the education system prepare students for jobs that don't yet exist?

The development of the new college and career readiness standards has started to answer these questions, but there is an ongoing need to engage a wide audience in the discussion about the knowledge, skills and competencies all students will need. Developing a broader range of learning opportunities for students is a critical part of meeting this challenge. MassCore already defines the minimum experiences to which all students should have access. The ongoing implementation challenge is to ensure that more students, from all backgrounds, can access and complete MassCore. Massachusetts should also be bolder here and look at other, new interdisciplinary learning that will help students succeed in the future economy.

The Commonwealth also needs to ask what the education experience of its students might look like in 20 years' time. What is the potential of the new models of student-centered and personalized learning in which students learn anytime and anywhere, both inside and outside of school? New pedagogies, which combine new approaches to teaching with the power of technology allowing students to progress upon demonstrated mastery of specified knowledge and skill rather than in relation to age or time spent on task, have the potential to significantly change the way students learn. A number of districts and schools are already pioneering these approaches, but more needs to be done to stimulate and support these new approaches to provide clear models of practice and evidence of the benefits to students. These developments also bring with them important implications for the accountability and assessment system.

What Massachusetts chooses to assess inevitably influences what is taught in schools and how it is taught. The clear implication is that the state must develop the capacity to assess a wider range of higher-order knowledge and skills. Many employers as well as teachers are already concerned about over-reliance on standardized assessment tests. The development of new and emerging assessment technologies offers significant opportunities to rethink how to combine assessment for accountability purposes with assessment of a formative nature which provides real-time feedback to teachers and students. In addition, making sure all schools and teachers are ready for these possibilities should be a critical priority.

Finally, in this chapter we argue that Massachusetts needs to continue developing a range of pathways that can help all students move through their education and ensure they leave both college and career-ready. Strong academic, vocational and mixed pathways, through middle and high school, should be available to offer routes for all students. To close the Top Talent Gap with other countries, academically gifted students also need greater opportunities to be stretched. The ultimate goal should be more students not just entering college, but completing college and/or

CASE STUDY: Curriculum reform in Singapore

In Singapore, curriculum reform started in 2004 with the introduction of the 'teach less, learn more' policy, which aimed to open up 'white space' in the curriculum to engage students more deeply in learning.[1] Singapore would say they don't, and indeed can't, know what skills students should be learning for success in the 21st century given how fast the global economy is changing. They see their task as to prepare students to cope with and even thrive on the uncertainties, and to give them the skills and attitudes required to navigate their own lives and careers.

progressing to the high-skill jobs that will be the future of the Massachusetts economy.

What knowledge and skills does Massachusetts want from an educated citizen in future?

The new Massachusetts Curriculum Frameworks, if implemented well, will help to ensure students have knowledge in math and English language arts, and the skills to apply it, which compares favorably with the best in the world. Massachusetts has already made good progress in implementing the new frameworks, but it should remain a top priority for the next three years, because the task is by no means finished. Several recent reports have highlighted the challenges that remain in Common Core implementation nationally, especially in achieving clear instructional shifts in the classroom.[2] Massachusetts faces similar challenges. It has also been evident, both from our conversations with employers and from the MBAE survey, that employer awareness of the new frameworks is currently low. This poses particular risks when the achievement of the new standards is assessed for the first time. We recommend that raising employer awareness and support for the new standards is made an immediate priority. The MBAE is already planning to raise awareness through the 'Future Ready' campaign.

On their own, however, the new Curriculum Frameworks will not be enough. In addition to seeing their implementation through, Massachusetts also needs to examine what lies beyond. This means developing a broader and widely shared understanding about what it would mean to be an educated citizen of the Commonwealth in ten or twenty years' time, a vision that will appeal to employers, educators, parents and young people themselves. The world will be a very different place by then and, given that fundamental changes in curriculum and assessment can only be rare and always take time to implement effectively, it makes sense to start thinking systematically about the longer term right away. The debate about what students should be learning is not unique to Massachusetts; it is happening all around the world and there may be lessons to learn from other countries.

Professor Michael Fullan sets out six core competencies he believes will be critical for Ontario students:

- Character
- Citizenship
- Communication
- Critical Thinking and Problem Solving
- Collaboration
- Creativity and Imagination

Ontario in Canada – another top performer in the OECD-PISA comparisons – is also having this debate. In his recently published strategy document for Ontario's next stage of reform, *Great to Excellent*,[3] Professor Michael Fullan sets out six core competencies he believes will be critical for Ontario students. These are Character, Citizenship, Communication, Critical Thinking and Problem Solving, Collaboration, and Creativity and Imagination. Another Canadian province, Alberta, has also encouraged widespread public debate in the past few years about what an educated Albertan should be

> As the Prime Minister of Singapore put it, "The skills needed in the future will be very different from those needed today. Education offers each individual and nation the best chance of navigating an unknown future – coping with uncertainty, adapting to evolving conditions and learning how to learn. Students need to think for themselves, to practice working in teams, to develop their creativity, and to learn ethical behavior, such as personal responsibility and valuing individuals regardless of their backgrounds."[4]

like two decades from now. In Australia meanwhile they have introduced a National Curriculum for the first time, ensuring not just benchmarking of standards in the core subjects, but also opening a public discussion of how the school curriculum should present Australia's role in 'The Asian Century'.[5]

Through its new definitions of college and career-readiness, Massachusetts has already started to identify the broader range of skills and competencies it wants all students to develop.[6] However, our sense from interviews with a range of stakeholders is that more work is needed to promote understanding of the new definitions as well as the importance of the broader range of competencies and skills they set out. In particular, there is a need to develop a common language for educators and employers that describes the desirable range of knowledge, skills and dispositions in a short and memorable way (as Michael Fullan's 6Cs do for Ontario). The discussion also needs to engage with some of the wider issues raised in the Council on Foreign Relations Report, quoted in the introduction, about America's role in the world and what that means in Massachusetts. Furthermore, parents and young people have barely been engaged in the debate to date.

We do not want the Commonwealth to repeat conversations which have already taken place, but we would argue that there is a need to widen and broaden engagement in the debate about what an educated Massachusetts citizen will look like in future. This means an ongoing public conversation similar to that in Singapore, Ontario and Australia – and many other countries across the world - about the wider knowledge and skills students will need for success in the 21st century. Our recommendation is that the MBAE should support this wider conversation as part of its 'Future Ready' campaign with employers. We also think there would be value in engaging both parents and students in this debate – this could be done face-to-face at school and district levels, but also by inviting students and parents to participate in an online conversation. The campaign should begin in 2014 and continue through 2015.

Developing a broader range of learning opportunities

Developing a clear vision of what Massachusetts wants an educated citizen to look like is the first step. The next question is how to develop a curriculum and broader range of learning opportunities that give access to high standards in the core subjects as well as a wider range of higher order knowledge and skills among students. We start to imagine what this would look like above.

In *Oceans of Innovation*, Michael Barber has developed a simple formula that shows how education systems can think about combining knowledge with a broader range of skills and dispositions. The formula is:

Well Educated = E (K + T + L)

The K stands for knowledge, which means 'know how' (skills) as well as 'know what' (content). This is what we want children to learn in school. Clearly how to read and write and do basic mathematics; clearly an outline of the history of their country in the context of the world; and clearly too an introduction to science, without which modern life cannot be understood. In addition, they need to learn skills related to information technology, including how to code, take notes and make a succinct summary. To illustrate, we want students not just to know Pythagoras' theorem in the sense of being able to describe it; we want them to know when and how to use it to solve problems they might come across in the real world. In Massachusetts we want them to know the outline of American history but also to debate it and see it from different perspectives.

The T stands for thinking or thought. Teaching children to think has been a profound and underlying goal of education at least as far back as Plato. Moreover, the evidence shows overwhelmingly that when children are taught to think, and to reflect on how they are thinking as they learn their subjects, their performance significantly improves. The implication of this argument is therefore not that there should be some separate set of classes in 'thinking skills', but that subject teachers should be able to teach different approaches to thinking through their subjects. As Daniel Willingham argues, teaching thinking cannot be separated from teaching knowledge. A glance at the workplace, not to mention the public sphere, demonstrates powerfully just how important it is to master different ways of thinking. Sometimes the demand is for a three-minute synthesis of an argument or issue; other times it is for a long reflection on all sides of an issue. Sometimes we need to think in teams, other times alone. Sometimes we need to be deductive; other times, inductive. Sometimes we need to prioritize and focus; other times we need to create and imagine. Building into the curriculum activities once thought 'extracurricular', such as competitive debate, is one example of teaching critical thinking and the capacity to make a case. The literature on cognitive science has advanced dramatically in the past

25 years; it is now conclusive that capacities such as creativity or intelligence we once thought were innate and fixed are in fact learnable and can be continuously developed.

The L stands for leadership – leadership in the sense of being able to influence those around you in the family, community, workplace or classroom. In this sense, leadership really is, or should be, for everybody. The challenge for a school or school system is to teach this quality – the ability to communicate, work collaboratively in teams, stand up for a point of view, see another's point of view and make decisions. The answer is to provide, during the course of a school week, many different opportunities in which different children can seize the opportunities to lead – in sport, drama, music or expeditions, for example – in addition to the leadership opportunities available in ordinary classes.

The E in the calculation stands for ethics. Again, ethics cannot generally be taught as a separate subject. It needs to be learned from the way the school operates, the way the teachers and students interact, and the way the school interacts with the communities it serves. Hence the E in the equation being outside the brackets. As traditional institutions, such as the family or church break down, increasingly schools are the only social institutions we can rely on to inculcate in young people the values and ethical underpinning on which our collective future depends.

Other countries are debating how to achieve the right mix of knowledge, thinking, leadership and ethics described above in their own curriculum.

Beyond the achievement of college- and career-ready levels of competence in ELA and math, Massachusetts has already set out, through the MassCore program of study, the minimum range of knowledge and experience it wants all students to have in preparation for college and careers.[7] Its requirements include:

- Four years of English, four years of math, three years of a lab-based science.
- Three years of history, two years of the same foreign language, one year of an arts program.
- Five additional 'core' courses, such as business education, health, and/or technology.
- Additional learning opportunities, including AP classes, dual enrollment, a senior project, online courses for high school or college credit, and service or work-based learning.

Massachusetts has only recently started to collect data on completion of MassCore, previous data was based on self-reported data from districts, so Massachusetts will now be able to monitor more closely how many students are being offered, and complete, MassCore. The short-term system reform question for Massachusetts will be how to ensure

A FUTURE learning scenario for all Massachusetts students

IMAGINE a future knowledge era, where finding basic facts and information is effortless and success depends on behaviors. The curriculum, therefore, is not just built on output of knowledge, but also on demonstration of behaviors such as resilience, adaptability, empathy and creativity. Cultivating these outcomes has meant that the curriculum has a greater emphasis on deepening understanding of a few topics rather than shallow breadth of many. Explicit curriculum outcomes include interdisciplinary skills and a disposition to lifelong learning. Henry Ford Academy in Dearborn, Michigan is a leading example: here the curriculum is based on design theory, and students are given a simple design challenge with a tight timeline, such as designing a personalized nametag for school identification. Students approach problems with a mindset of "how might we...?"[8]

CASE STUDY:
Development of a new curriculum in Australia

In Australia, the development of a new curriculum encompassed the development of 'general capabilities', seven core key skills all students are expected to develop: Literacy, Numeracy, Technological Capability, Critical and Creative Thinking, Personal and Social Capability, Intercultural Understanding and Ethical Understanding. In addition to these 'general capabilities', Australia's curriculum retains traditional domains of subject knowledge as well as three specific interdisciplinary priorities: Aboriginal and Torres Strait Islander histories and cultures; Asia and Australia's links with Asia; and Sustainability. The curriculum content is specified, and further guidance is given to teachers through content elaborations and annotated examples of students' work to illustrate standards. The curriculum is presented online, and can be accessed by teachers to see how a particular general capability might be delivered within specific subject topics. In this way, the Australian curriculum promotes both knowledge in traditional subject areas and a broader range of skills, but also helps teachers to see how the two might be combined. For more information see http://www.australiancurriculum.edu.au/

more students access, and complete, the full program set out in MassCore. (Our proposals to extend the range of learning opportunities available to low-income students are discussed in Chapter 6.)

On its own, however, simply giving more students access to the current MassCore program will not give them the mix of knowledge, skills and competencies they need for the 21st century economy. Massachusetts needs to think more boldly about the future learning opportunities students will need – this is the systemic innovation that would support the system reforms described above. As an example of what we have in mind, look at the opportunities provided by the world of coding.

Professor Mitch Resnick from the MIT Media Lab, inventor of Scratch (one of the leading programming languages for children) and a global thought leader in the space, states that coding also develops essential 21st century skills. It helps students to think creatively. For example, why should students do their English or math homework assignments on static media such as paper and scrapbooks when they can create interactive programs for the same purpose? It also helps students to reason systematically and work collaboratively. Coding allows students to collaborate effectively on projects, whether it's writing a program together or bringing science experiments to life.

This is just one example of integrating new skills within the broader curriculum. As Massachusetts updates the curriculum frameworks for subjects outside the core, its leaders will need to think imaginatively about what other skills and competencies can be embedded and developed across the curriculum in this way. We set out below how different the curriculum and student experience might look for a typical elementary and secondary school student in 2030 with new approaches to teaching and the use of technology transforming the possibilities for interdisciplinary learning.

Developing new approaches to learning

Achieving this vision of a curriculum that gives all students a deeper and broader range of knowledge, skills and competencies is unlikely if schools and teachers continue to

MAKING CODING a core part of the future curriculum

IMAGINE a future where all young people will learn the basics of computer programming and software tools, not necessarily as a separate class, but integrated in and as a key enabler to every subject and competency. Learning how to program is often viewed as a hobby, a luxury limited to certain individuals with a passion for technology. Twenty years from now this will not be the case anymore – coding will be a basic life skill as essential to being successful in the 21st century as knowing how to send email, or use Excel or PowerPoint. Governments and education systems around the world are realizing this shift. The UK Education Secretary Michael Gove announced earlier this year that teaching children how to code would become an essential part of the school curriculum. Other countries are trying to capture the economic opportunities offered by a technologically literate citizenship and have set up units to encourage this, including MARSDD in Toronto, SPRING in Singapore, Silicon Roundabout in London and Escritorio in Minas Gerais.

operate within the confines of the current 20th century education model. Currently, all students are taught in the same way, for the same amount of time and are expected to progress at the same pace. We agree with those who argue we need to reimagine the student learning experience if every learner in Massachusetts is to emerge ready to contribute to the new economy.

These new approaches to student learning have been given different names, including personalized learning or student-centered learning,[9] but whatever they are called, they share common features.

- **Learning can take place anywhere and anytime,** both within and outside schools. This means giving all students equal access to out-of-hours learning opportunities (we will return to this in Chapter 6.) It will also undoubtedly involve technology and new, blended learning approaches (which we look at in more detail in Chapter 5). For many students schools will continue to provide a safe and secure environment for students to study both within and outside of the formal school day.
- **More personalized approaches to teaching,** in which teachers tailor their approach to each student to take account of where the student is, regularly assessing and adapting their approach in light of progress, and responding to the student's needs and interests. The role of the teacher becomes not simply that of facilitator, but instead what John Hattie, Professor of Education at Melbourne University, calls an 'activator', providing challenge, inspiration and support in overcoming the barriers that lie on the road to deep learning. (Chapter 4 sets out what this new approach to teaching would look like in practice.)
- **A new role for students in their own learning.** Students should take much greater responsibility for their own learning, and receive much more substantial feedback from teachers and other students to help them understand their own strengths and learning challenges.

> By making coding an essential part of the future curriculum, Massachusetts can both support the development of 21st century skills and accelerate the technology innovation the state is renowned for.

ELEMENTARY SCHOOL 2030

Waiting for the children's concert to begin, parents were talking about how elementary school had changed since they had been there a generation earlier. They noted first that some things had stayed the same – certainly the activities, the sport and the drama as well as the music were not that different, though with the longer school day and year students had more time for them. Also not that different was the face-to-face teaching of early reading and writing, although the teaching was consistently good now, and there was a shared understanding among the teachers, who planned together, what the best practice was. At the beginning of the term the content and teaching approach for the next few months was explained to parents very clearly and the role they could play at home was reinforced. The availability of excellent online materials that child, teacher and parent could all access at any time reinforced the face-to-face teaching and parents could get an update instantly on how their child was doing, what her next steps needed to be, and how as parents they could help.

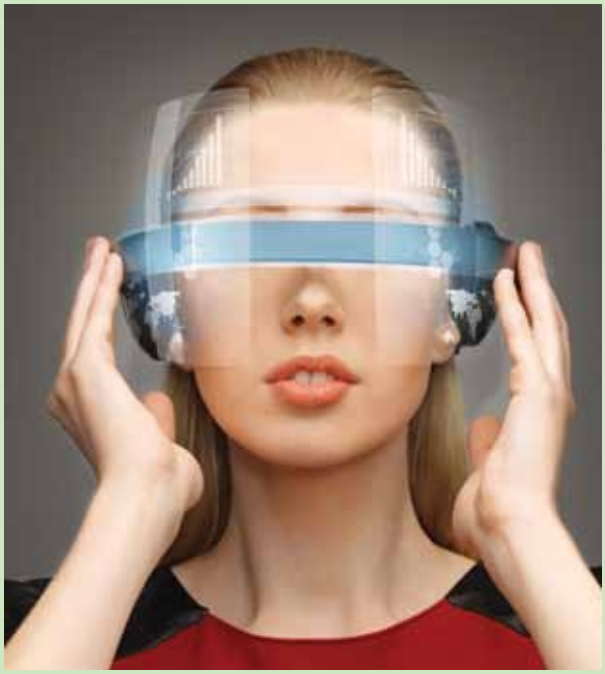
The teaching of subjects such as American history had been transformed too by the availability of wonderful simulations which enabled the children to feel as though they were present and indeed able to participate in the Dred Scott trial or the moon landing. Whereas for math and ELA there was still a devoted, recognizable lesson each day, usually in the morning, in these curriculum areas the idea of a standard lesson had pretty much gone. At any one time the children were involved in one or two major themed investigations, supported and encouraged by the teachers, drawing on resources beyond the school and often culminating in a presentation to the year group or even the whole school. Then every week, each child had an hour one-to-one with their personal tutor, reviewing the week just gone and looking ahead to the next. The children were encouraged to reflect on what they had learned and how they had learned it. Once a month the parents were invited to join this conversation.

The problem parents had in the evening was stopping the children from pursuing the educational activities that it was so easy to continue at home. Some professor or another from MIT had said recently that the best thing the state of Massachusetts ever did was to invest in the collaboration of great educators and great edtech innovators thus enabling computer games, curriculum content and assessment to be integrated and generate these remarkable materials. They had understood back then that the way to exploit technology was to put teaching and learning in the lead and change the system to accommodate it. As the children came onto the stage to rapturous applause, the parents' conversation came to an abrupt end with the thought that this professor had hit the nail on the head.

HIGH SCHOOL 2030

A lot of the content you needed to succeed in high school you could now get online at home. There were numerous sources, recommended by the school. For example, the state's leading universities such as Harvard and MIT incentivized their professors to produce online lectures, with marvelous graphics, specifically for high school students, because by doing so they generated the supply of future graduates and transformed the image of universities.

Even so, going into school each morning was still the expectation. As always, the social aspects of school had their appeal but the motivational power of the whole learning experience was now of a different order. No two days were the same. They involved a different mix of individual study, teamwork focused on solving problems, seminar discussions and arguments about the content learned at home, large classes with top lecturers – beamed in as holograms - on important curriculum themes and one-to-one sessions with a personal tutor reviewing progress on an individual learning plan and thinking through the next steps. In effect these were counseling sessions. Then sometimes for an entire week, the school as whole would focus on some major issue affecting the community and apply its educational and human capital to solving the problem or enacting the solution.



The curriculum had moved on since the Common Core had been introduced 15 years ago. Not that the Common Core had been replaced; rather it had been extended and deepened. Contrary to received opinion back then, it turned out that excellent teaching combined with inspiring online materials ensured that pretty much every student could, in time, master the Algebra 2. Some students came to it from a theoretical perspective; others from an applied or vocational perspective, depending on their preferences. In addition to the core subjects, high school students could study a much wider range of vocational and academic elective options too. Many of these options were now available through online courses. The school had become an orchestrator of educational options as much as a provider. This meant the faculty had to be aware of what options were available, but the key was for them to know the students well as individuals, and to provide constant challenge and encouragement as students took on ever more difficult assignments. The most talented students were assembling university-level courses in their learning profiles; others were mastering vocational skills, such as coding, plumbing or customer service. Their learning profiles described not just their progress on these outcomes but their progress too in learning the leadership, interpersonal and team working skills that the economy valued so highly.

Since 2015 many school buildings had been redesigned with some of the old classrooms being let as design studios, startup incubation spaces and offices. Increasingly as students moved towards graduation, the school was a place where learning and work seemed to merge, just as in workplaces across the country work and learning were becoming synonymous.

- **Learning should be competency based,** with students progressing on mastery of core competencies rather than by age or the number of hours completed.

The key to reshaping the student's learning experience in these directions will be the development of scalable innovative pedagogies and the technologies needed to support them – subjects which we will turn to in Chapters 4 and 5. Massachusetts already has a number of districts and schools pursuing these approaches to deeper learning, as the case study on the next page shows. But more is needed to stimulate these new approaches in the next phase of reform and to create the right conditions for schools and teachers to experiment and develop further models which show improvement for all learners. In Chapter 5, we recommend an Accelerated Learning Challenge competition for Massachusetts and an Innovation Collaborative to share and spread effective new practice across the state. We think the development of new student learning experiences should be a key focus for the first round of this competition. The Innovation Collaborative has a critical role in evaluating and learning from these approaches, and then sharing and disseminating what is learned.

Moving towards these new models of student-centered learning is a major change, and may take a decade or more to achieve. Such a transformation has important implications for assessment and accountability systems. Student-centered learning requires new forms of assessment to measure students' mastery of material when they are ready, and to provide rich, real-time feedback to teachers so that they can tailor their instructional approaches. A shift to student-centered learning also has implications for the use of assessment for accountability purposes. We have heard strong arguments from both educators and employers that formalized testing has reached its limits, and that the state needs to reduce the amount of formal assessment on students. We are sympathetic to this argument, particularly as new types of accountability measures are developed (such as measuring the number of students who go on to complete some form of post-secondary education). However, measurements of student attainment and student growth will remain the most important measure of the success of schools and teachers and these measures depend on having reliable measures that are comparable between schools. There is a trade-off between reducing the frequency of testing and the ability to generate such measures to provide parents, educators, and policy makers with benchmarks external to the school.

There is therefore a balance to be struck between maintaining regular statewide assessments which are taken by students at the same time, and movement towards greater emphasis on measures of student progress that are not tied to grades or ages in accountability arrangements. As we said above, implementing the new assessments for Massachusetts Curriculum Frameworks should be the

A NEW student learning experience

IMAGINE a future with an acceptance that the learning environment is ubiquitous and includes home, community, transportation and designated learning facilities. These newly designed learning facilities are integrated into community centers, corporate innovation labs and startup centers. Schools include innovation hubs that provide unstructured space for working on ideas. YouMedia has shown that this approach is effective, by reworking libraries into informal digital exploration spaces for teens.[10] Imagine a future where student progression and categorization occurs not by predetermined age or grade, but instead by individualized skill and competency across a multitude of subjects and behaviors. This allows the progression and learning program to be personalized and breaks the old assumption that equal time and support is needed for every student.

priority for the next three years. But as teachers develop greater expertise in assessment – as described below – the system should move to greater use of teacher-led assessments as the primary basis for measuring student progress and growth, with the state limiting external examinations to a smaller number of grades – perhaps at 4th, 8th and 10th – while conducting other statewide tests on a sampling basis in line with the approach the OECD takes to PISA.

Developing new approaches to assessment

For assessment, the implications of the above argument are profound. Returning to the Well Educated = E(K+T+L) formula, new forms of assessment are needed that evaluate not just K but also T, L and E. The intention of PISA to test collaborative problem solving in 2015 is one indication of future direction. Meanwhile, as technology moves on, new forms of assessment, just-in-time and using simulations, are becoming both possible and affordable. Massachusetts is already developing new approaches to assessment through the Partnership for Assessment of Readiness of College and Careers (PARCC). Ensuring that the assessments developed for the implementation of the new curriculum frameworks are fit for purpose is the immediate priority for Massachusetts. But Massachusetts should also be looking beyond these new assessments to anticipate what other assessments it will need in future. If it acts with urgency, Massachusetts has the opportunity to become a world leader in more sophisticated assessment systems, which provide schools and teachers with the more regular feedback that is so critical to the approaches described.

> The key to reshaping the student's learning experience in these directions will be the development of scalable innovative pedagogies and the technologies needed to support them.

There are two types of assessment that Massachusetts will need to think about developing. The first is assessment used in order to hold educators and students accountable for student achievement – often referred to as summative assessment. The second is assessment intended to provide the

CASE STUDY:
Boston Day and Evening Academy

Boston Day and Evening Academy (BDEA) is an alternative public charter high school located in Roxbury. "BDEA is open 10 hours a day in order to serve any Boston Public School student who is overage for high school, who has had trouble with attendance issues, has been held back in 8th grade, who feels they are not getting the attention in class that they need to succeed, or who has dropped out but is eager to come back to school to earn their diploma." They also offer a Distance Learning Program supported by technology for students that are unable to attend school on a full-time basis. BDEA is a student-centered, competency-based school. "Every BDEA student must complete three steps before receiving a high school diploma: Passing the MCAS exam, demonstrating competency in all core subjects, and completing and presenting a capstone project which combines a research component with a written product." See www.bacademy.org for more.

student and teacher with immediate feedback on whether students are mastering the material or need additional help. Peter Hill, who was heavily involved in the development of the Australian National Curriculum and who previously led the development of a new assessment system for secondary students in Hong Kong, has set out some of the emerging possibilities for the future of both types of assessment.[11]

One of the most frequent problems with the assessment systems of the past has been their inability to assess the full range of outcomes, with questions rarely assessing the kinds of thinking and cognitive processes that result from deep learning. Many would argue that this is the problem with the current MCAS assessments. Online assessments offer much greater potential to assess this deeper learning: for example, automated essay scoring systems that allow greater use of longer, essay-style assessments which test students' detailed understanding of problems; computer-aided testing systems that allow students to progress to harder or easier questions depending on their earlier answers; or virtual environments that can test collaboration in a variety of scenarios. Real-time simulations, in which students are asked to answer questions by interrogating additional information available online before determining their answers, also offer possibilities for assessing the broader range of competencies Massachusetts wants to see.

Online assessment systems also radically change the possibilities for providing real-time feedback to students and teachers about their performance. The world of sport – and specifically cycling – offers an insight. Sir Bradley Wiggins was the first British winner of the Tour de France in 2012 and also an Olympic gold medalist. In his autobiography, he describes how the data from each of his training rides – his times, power outputs and cadence from each ride – were captured by his team and analyzed on a daily basis to determine what his training schedule should be for the next day. They used the data to improve the output he was getting for the same energy.[12] This kind of approach is quite normal among top athletes and those who evaluate and employ them – think *Moneyball*!

Imagine if equivalent information about student learning could be available to teachers on a daily basis after each lesson, telling them what students had learned, whether they were ready to move on, and where they needed more help. Online assessment radically changes the possibilities for collecting this information. It might take the form of a series of standalone mini-tests or quizzes, but increasingly will be embedded naturally into learning activities so that assessment is continuous and unobtrusive, making use of the student's digital footprint and encouraging immediate attention to learning obstacles if and when they are encountered.

In fact the development of this type of more frequent online assessment, and the collection of granular data about student progress that it allows, has the potential to eliminate the distinction between formative and summative assessment. If teachers are able to monitor the progress of their students on a daily and even lesson-by-lesson basis using these new forms of online assessments, then this information could also be available to principals and potentially the public also, meaning that it can be used for the purposes of holding educators to account and also reporting student progress at the state level. The emergence of Learner Analytics (the capacity, made possible by technology, to capture and analyze large quantities of data about learning from large numbers of students) can help to generate an immensely powerful evidence base from these new forms of assessment.

The biggest challenges will lie not so much in teachers and schools being able to obtain this data, but in managing it and turning it into powerful and practical knowledge that they can use to inform day-to-day decisions.

> The possibilities of new assessment technologies are only just beginning to emerge and will require significant investment and development to fully realize the benefits.

Massachusetts has already made important strides towards making detailed and granular information about student performance available to schools and districts through the development of a new reporting and data analysis tool called Edwin Analytics.[13] The purpose of the new system is to give schools and districts greater access to the data held on student performance, including longitudinal data from pre-kindergarten through to post-secondary education.

The information generated by new assessment systems will have value well beyond the individual learner: it will provide a potential source of generalizable new knowledge

THE FUTURE of assessment

IMAGINE an assessment system that measures higher-order thinking and interpersonal skills. The system is integrated into the curriculum and learning day, monitoring progression over time instead of at a single instance. Technological advances in online and continuous data collection have opened up new solutions. Assessments are linked to global standards – students, parents and teachers in Massachusetts will know how they are performing and progressing relative to their peers at state, national and international level. These assessments will provide actionable data that serves a multitude of interests, including teacher and school system effectiveness evaluations for the state, individual learner achievement monitoring to feed back to the teacher, and an impetus for parental engagement. Computer adaptive testing and simulations to test collaborative problem solving have already been implemented on a small scale in Hong Kong and Singapore.

about learning and instruction that can be revealed through the application of data mining and data analytics.[14] This can be transformed into excellent guidance for teachers, and indeed provide the evidence base for the collaborative practice development set out in Chapter 4. Teachers themselves will be able to use this data to drive their day-to-day decisions about what particular content to cover. Though currently in its infancy, within the 20-year timescale this report considers, it is likely to have a dramatic impact on every student and every teacher, every day.

The possibilities of new assessment technologies are only just beginning to emerge and will require significant investment and development to fully realize the benefits. Already other countries are starting to move in this direction – the Australian Government, for example, has just published a set of principles for national online assessment.[15] As we have argued, given its high levels of relevant capacity, Massachusetts has the opportunity to become a world leader in this field. To do so will require a statewide strategy to promote and develop sophisticated online assessment further, deeper and faster in the next ten years. It will require investment and support from the DESE, districts, schools, higher education, businesses and the edtech community to fully realize these opportunities.

Developing pathways to success for all students

Our entire argument so far in this chapter has been that Massachusetts needs to continue to drive reform to standards, curriculum and assessment in order to ensure that all of its students graduate well-equipped for success in higher education, skilled employment and life. In the coming chapters, we will look at further specific reforms intended to improve the number of students successfully progressing through the school system. At this point we want to focus on strengthening two particular pathways: one is for students inclined to opt for a vocational route, and the other for top-performing students.

Many of the stakeholders we spoke to were extremely positive about the contribution that Massachusetts vocational high schools have made over the past 20 years. They pointed out that many of these schools are now over-subscribed. Concerns were expressed however over how to ensure more students could be given access to the opportunities vocational high schools provide, especially as some felt that these schools had become increasingly selective in their admissions, and students who might be able to benefit from attending them were no longer able to gain access.

The sector itself argues it can make a greater contribution to the goal of ensuring all Massachusetts citizens are

career and college-ready. In his insightful piece about the future of vocational and technical education,[16] Dr Michael F. Fitzpatick, Superintendent-Director of the Blackstone Valley Vocational Regional School District, makes a powerful case for the future role of this sector. He is keen to stress that students who choose this pathway should make college readiness as much of a priority as career readiness. Even those students who don't immediately enter college should be given lifelong learning skills during their education that would allow them to access post-secondary education in the future.

We agree and recommend that Massachusetts should expand the opportunities provided by vocational technical high schools by allowing the most successful ones to grow. It should also look at new models of delivery that provide partnerships – both face-to-face and online – between these schools and regular high schools so that greater numbers of high school students can access at least some of the experiences these schools provide.

Massachusetts also needs to do more to increase opportunities for its top performing students if it is to close the Top Talent Gap. It has already focused on giving more students access to Advanced Placement courses. Some of these programs, such as the Massachusetts Math and Science Initiative, are clearly having an impact: the overall numbers taking AP exams have increased by nearly six percentage points over the past five years. A number of schools have seen even more dramatic improvements than this and 33 Massachusetts districts were recently named to the 2013 AP District Honor Roll by the College Board for expanding access to the AP curriculum.[17]

However, we believe Massachusetts needs to go further and faster in increasing opportunities for top-performing students. Chester E. Finn, president of Thomas B. Fordham Foundation, has been researching different approaches to developing gifted and talented young people across the globe. While he does not see an instant answer in what other countries are doing, his research leads him to believe that states need to be much more radical and imaginative in their approach to developing academically gifted children if the US is to compete with other high-flying education systems around the world. We agree. The opportunities offered by technology in the coming decade will make it easier for Massachusetts to develop clearer 'fast track' pathways for the academically gifted, and to offer resources to a much greater number of students, thus overcoming some of the objections to selecting a specific group of students for this type of support.

Given how far behind Massachusetts is compared to the top performers in the leading education systems, we recommend developing a specific strategy to promote opportunities for academically gifted young people. This might include greater incentives for schools where higher numbers of students achieve advanced level performance. It should include new models of delivery for these students. Massachusetts should pilot new virtual or hybrid schools specifically for academically gifted and talented young people. As a starting point, they should offer after-school classes and summer schools. They could also offer full-time schooling for a small number of academically gifted children. There would be obvious benefit to connecting such schools to the state's leading universities, and the State should be working systematically with universities to identify the existing online courses and material that might provide enrichment opportunities for the most talented students. If the experiment worked, a statewide network of such schools could be developed that could provide insight, advice and online materials for the entire school system.

The opportunities offered by technology in the coming decade will make it easier for Massachusetts to develop clearer 'fast track' pathways for the academically gifted.

Conclusion

Massachusetts should remain firmly focused on seeing through implementation of the new curriculum frameworks and developing new assessments aligned with college- and career-readiness. At the same time, it should continue to develop a wider vision of the knowledge and skills required for its citizens in 2030 and expand access to the broader curriculum envisaged by MassCore. It should also build on the success of the vocational-technical sector. In terms of systemic innovation, we argue that Massachusetts needs to be more imaginative in looking at the skills students will need for success in the new economy, such as computer coding. It should encourage schools and teachers to experiment with new models of personalization for students. Massachusetts should be investing now to become a global leader in the development of online assessment technology. And if it is serious about closing the Top Talent Gap, Massachusetts needs a deliberate strategy for supporting the most academically gifted children, and this should be given equal priority to closing achievement gaps. We summarize our main recommendations on the next page.

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15 Standing Council on School Education and Early Childhood, Principles for National Online Assessment, 2013

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RECOMMENDATIONS

By 2016 Massachusetts should:

- Hold a statewide conversation with employers, educators, parents and young people about what an educated citizen will look like in 2030.
- Ensure employers understand the rationale and demands of the new Massachusetts Curriculum Frameworks through the Future Ready campaign.
- Increase access to, and achievement of, MassCore among all student groups.
- Implement the new PARCC assessments which measure college and career-readiness.
- Increase the number of places in vocational high schools and/or established new High School Partnerships that offer a greater range of vocational opportunities to all students.
- Establish several virtual/hybrid schools for academically gifted young people.

RECOMMENDATIONS

By 2020 Massachusetts should:

- Fully implement the new curriculum frameworks and assessments and demonstrate clear instructional shifts in classroom practice.
- Become a global leader in the use of new forms of online assessment which test wider competencies and skills.
- Establish new models of student-centered education, with successful demonstration projects at district and school levels, supported by the Innovation Collaborative.
- Establish a statewide network of partnerships between high schools, vocational high schools and virtual schools for academically gifted young people, taking full advantage of virtual and hybrid school models.

CHAPTER 3

THE FUTURE DELIVERY SYSTEM

MASSACHUSETTS SHOULD:

- Extend management freedoms and flexibilities employed by Turnaround (Level 4) schools to all schools.
- Incentivize the development of multiple school models in each local area, especially high-need, and remove the Charter Cap or any other limit on which school models parents can choose.
- Encourage the development of school-to-school partnerships including those that span district boundaries so that every school is part of at least one effective cluster or network.
- Run a district design competition to develop new models of district governance consistent with the emphasis on school autonomy, and tie any additional funding for districts in the next two years to the development of acceptable reform proposals.
- Reduce the reporting requirements for districts and schools to the Department of Elementary and Secondary Education (DESE) and introduce routine district "Stocktakes".
- Undertake an independent study of the future role and functioning of DESE.

In this chapter we look at the delivery system in Massachusetts – the set of system actors (people and organizations) and the relationships between them, through which improvements in the education of young people will be implemented. We start at the level of individual schools, then work back to the level of the state. In turn, we look at clusters or networks of schools that enable teachers to work together and learn from each other, followed by the role of districts and how it might need to change to support and challenge these partnerships of schools. Finally we examine the role of the Department of Elementary and Secondary Education (DESE).

Our starting point, as outlined in Chapter 1 above, is that the main challenge ahead of Massachusetts, as a high-performing system, is not to mandate adequacy, but to unleash greatness. This requires a significant reduction in the regulation emanating from the state and districts, and the simultaneous introduction of greater autonomy at school level so that principals and faculty can take responsibility for achieving the desired educational outcomes. This autonomy should be within a framework of transparency and accountability, which enables parents and taxpayers to see the outcomes being delivered, and of collaboration between schools to drive improvement. We recognize there are some schools and some districts where performance is unacceptably low. The state must therefore always maintain the capacity to intervene and, if necessary, to mandate change, but the principle should be intervention in inverse proportion to success – districts and schools that are successful should be given greater freedom to lead the next phase of their own improvement.

Unleashing greatness also involves creating and promoting a culture of innovation, in which the creativity of educators and the remarkable possibilities of modern technology flourish. Looking ahead 20 years, it is impossible to imagine that the dramatic transformation needed could be planned and implemented from the top down. It is much more likely that a transformation might emerge from within the system from the bottom up, if the right context were created and the right demand from citizens expressed. Those who lead the state should establish this context and continuously refine and develop it over time.

The other key feature of the current delivery system is the very large number of districts Massachusetts has compared to some other states. For example, Massachusetts and Maryland both serve approximately one million K-12 children. Massachusetts has 351 districts, many of them small districts. Maryland has only 24 districts. A consequence of Massachusetts structure is there are great differences between the challenges faced by large urban districts and those faced by smaller and suburban districts, many of whom are facing greater financial pressures. A one-size-fits-all theory of change, that doesn't take account of these differences, will not produce the required transformation. Greater differentiation is needed in the approach to districts, and a key principle should be to encourage greater diversity in the education delivery models for schools and districts.

Increasing freedoms for all schools and developing a greater diversity of school models

Evidence from other countries suggests that schools which have the freedom and flexibility to make key decisions about staffing, curriculum and budgets, alongside clear accountability for outcomes, are in the best position to decide how to meet the needs and aspirations of their students on a daily basis. As the OECD says about the lessons for the US from PISA 2012:

> *"While the US has devolved responsibilities to districts, the schools themselves often have less discretion in decision making than is the case in many other OECD countries. So the question for the US is not just how many charter schools it establishes but how to build the capacity for all schools to exercise responsible autonomy, as happens in most successful systems.[1]"*

We strongly agree with this, and believe the strategic goal for Massachusetts should be to develop a range of school models, all of which have greater autonomy. Massachusetts has already established greater freedom and flexibility for some schools in combination with stronger accountability for improvement. The 2010 Achievement Gap Act established additional freedoms for schools designated Level 4 under a Turnaround plan. These schools are allowed to override core elements of collective bargaining agreements including making changes to their curriculum, budgets and staffing, expand the school day/year and increase teacher planning time.[2] In return, schools are required to set clear goals for improvement and can access support from proven turnaround providers. The Act also created new Innovation Schools, which were also given similar freedoms over curriculum, staffing, budget, school calendar and professional development.[3]

Importantly, the evaluation of the first two years of the Turnaround work provides clear evidence that the Turnaround schools which made the most progress "were more likely to have actively used staffing flexibilities to ensure they had the teachers in place with the capacity, willingness and skill to move forward. They had also adopted deliberate systems to improve instruction (such as intensive coaching for teachers or principal and peer classroom observations) and used a greater proportion of their additional resources on teacher-specific professional development."[4] This shows that when used well, and in combination with the additional resources available, the freedoms granted to Turnaround schools have led to powerful learning gains.

Currently proposed legislation will extend Turnaround flexibilities to a proportion of Level 3 schools. But why stop there? Why not give these flexibilities immediately to all Level 3 schools? In fact, why not extend them to all schools in the state? It is perverse that the most successful schools in the state, which might be expected to be best able to innovate using such freedoms and flexibilities, are currently prevented from doing so. Put bluntly, this is shackling greatness rather than unleashing it!

We recommend that Massachusetts go further than the currently proposed legislation and immediately give all schools the same flexibilities available to Turnaround and Innovation schools. Boston has just proposed doing this for all of its schools. Indeed all districts are already free to give these freedoms to all schools but many have chosen not to do so yet. In part this is because of the constraints of local collective bargaining agreements, which is why we argue in Chapter 4 for a new grand bargain between the state and teacher unions and a simpler and thinner statewide teacher union contract. We would hope that many districts will in future willingly give these freedoms and flexibilities to all schools, and this should be incentivized as part of the district redesign competition described below. However, where schools want these freedoms and flexibilities, and the district does not grant them, the state should have the power to intervene and grant any school the same freedoms currently provided to Level 4 schools.

The strategic goal for Massachusetts should be to develop a range of school models, all of which have greater autonomy.

Charter Schools have been the other major pioneers of increased school freedoms and flexibilities in Massachusetts. Overall, the evidence on their impact in Massachusetts is positive. The most recent Center for Research on Education Outcomes (CREDO) study of Charter School performance in Massachusetts[5] showed that, overall, students in Charters had significantly higher growth than students in comparable district schools. Charters have also been more successful for students in poverty, and in closing gaps for black and Hispanic students in math (though less so in reading). However, the evidence also shows that much of this overall success is attributable to Charter Schools in Boston, suggesting that charters elsewhere in the state have much to learn from them.

The Charter sector raised another issue during our consultations; namely that they have not yet taken on the toughest challenges in the state. One of the Charter Schools we met with shared data which showed the absence of Charter Schools to serve students in the absolute lowest income communities in Massachusetts. Of course, this may in part be due to restrictions imposed by the Charter cap. It is encouraging that the Charter community saw this as their challenge – to make a contribution to solving the state's most intractable problem, namely raising performance in the most challenging schools. We were also impressed by the partnerships that many of these providers have formed with schools in Turnaround districts. This is strong evidence of their commitment to system-wide improvement.

The 2010 Act lifted the cap on Charter Schools in communities with the biggest achievement gaps, for proven Charter providers. We recommend a further lifting of the Charter

CASE STUDY:
Turnaround Success at Trotter Elementary School

As the Boston Globe reported on December 2nd 2013, Trotter Elementary School has made impressive progress over the last three years. It was one of the first schools designated as a Turnaround School in 2010. At that time, in MCAS only 13 percent of students scored proficient or advanced in English, and only 12 percent in math. In 2013 the equivalent figures were 39 percent and 37 percent. As Globe reporter Jamie Vaznis pointed out, the Turnaround freedoms enabled the school 'to make sweeping changes, such as replacing about half the teaching staff, adding dozens of hours of teacher training, and extending the school day by a half-hour. The Trotter also forged partnerships with outside organizations, such as City Year and Boston University's School of Education.'

Students have been encouraged to think more broadly and deeply and to spend more time understanding what they are studying rather doing test preparation drills. Principal Mairead Nolan told the Globe that the school resisted quick-fix solutions, preferring a rigorous curriculum and higher-order thinking.[6]

cap, which is a barrier to enabling some of the most successful providers in the state to serve students most in need of improved outcomes. In particular, the state and districts should ask the most successful and proven Charter providers in the state to take up the challenge they have set for themselves of demonstrating impact in the most challenging school environments. This also means allowing Charters to target and give preference in their admissions to students from underserved groups so that they can prove their efficacy with these groups of students.

At the same time, the state should continue to use its re-authorizing powers to bear down on failure in the Charter sector. There is no more reason to tolerate a poorly performing Charter School than any other poorly performing public school. The accountability system for Charters is already more robust than that for district schools, given that Charters are reviewed and re-authorized every five years. Districts should consider applying the same approach to re-authorization of their own schools. We will return to this theme when we look at the new role for districts, below.

It is easy to overcomplicate the role of the state which, at its most basic, is to ensure there are more good schools and fewer bad schools; this is what our proposal on Charters would enable. Leaders in the Commonwealth need to change the terms of the debate on Charters. For parents, families and students, what matters most is the quality of the school and the availability of options, not the legal technicalities of governance.

Given the need to unleash greatness from within the school system in the next phase of improvement, one might argue that having a variety of school models is an essential ingredient of the future, which every key stakeholder in the state should get behind. Without this, it is hard to see how the innovative capacity to deliver transformation could be developed.

Developing strong networks or clusters of schools to lead their own improvement

International evidence from PISA suggests, however, that autonomy on its own is not enough; it must go hand in hand with strong systems of accountability and with schools collaborating with each other to drive their own improvement and the improvement of the system as a whole. In short, the aim should be to create a self-improving school system, as David Hargreaves has described the aim in

> Systematic learning of this kind from peers is demonstrably more powerful than learning from remote experts, however good they might be.

relation to the English school system.[7] Such a system is one in which the state creates the context and conditions for success, and schools have both the incentives and the capacity to improve continuously in response not just to the demands of central authorities, but also to the expectations of the citizens. In other words, it would be a system that combined top-down and bottom-up pressure for change.

If this is to be achieved, Massachusetts will need to create stronger school clusters or school networks; what drives improvement is schools, principals and teachers learning systematically from each other — Michael Fullan calls this 'lateral capacity-building'. In some districts, these networks and clusters already exist in some form or another; in others, owing to their small size, clusters will need to stretch across district boundaries to ensure schools have an appropriate range of partner schools with which to collaborate.

Clusters and networks may need to be supported by outside partners where they don't have the capacity within their own systems for improvement, and the state may need to play a proactive role in developing the marketplace of these providers, as it has done in identifying the strongest providers to support Turnaround schools. The aim over time, however, should be to build the capacity within and across schools for them to lead and drive their own improvement and to choose which partners support them in this task.

There is growing evidence of the characteristics of clusters that work – and clusters that don't.[8] The ones that work are focused on improving teaching and learning, are data-driven, and involve faculty at every level. In each of the schools, time is set aside to make this possible. Activities in these clusters often include joint classroom observations, joint lesson planning and collaborative learning between teachers. Successful clusters also have at least one person – it could be an existing or recently retired principal or assistant principal for example – who prioritizes the cluster's work and ensures it is significant and beneficial for each of the schools. Clusters that fail are talking shops with occasional meetings in which the spirit of collaboration is invoked, but without any connection to changing the day-to-day realities.

There are significant benefits from schools collaborating with one another as long as that collaboration is effective and meets the criteria set out above. It enables teachers to learn from the best practices within other schools and study the impact of their practice and that of others on student outcomes. It also generates continuous professional dialogue about the specifics of teaching and learning. For example, rather than talking about the broad principles of good teaching, teachers can discuss precisely what works and doesn't when teaching a sequence of math to 9th grade students. Systematic learning of this kind from peers is demonstrably more powerful than learning from remote experts, however good they might be.

Both Singapore and Ontario, examples referred to in earlier chapters, have extensively used, and demonstrated the effectiveness of, school-to-school partnerships and networks. As well as these, in England, London's example is a powerful argument for the benefits of these partnerships in lifting student attainment and closing achievement gaps.

In addition to the supporting evidence London provides for our case here, it may also have relevance to Boston in particular. Michael Contompasis, former COO and Superintendent of Boston Public Schools, made a strong case for reform broadly along these lines in his Boston Globe article, *Reimagine, rather than patch, Boston schools.*[9] He argues for small clusters of schools with "increased flexibility and autonomy to shape their school environments…This approach reimagines the district as a system that embraces all types of school designs, including Charter and pilot schools and gives those institutions the freedom to create the conditions necessary for success." He

CASE STUDY: The London Challenge

London is one of the few capital cities in the world where educational results significantly exceed the national average. Results in national examinations at age 16 are better than any other region in England, and improving faster. In addition, children from low-income and ethnic minority backgrounds do better in London than in any other part of the country. Achievement gaps have been narrowed substantially, for example, among the Bangladeshi and Pakistani minorities. How has London achieved this success? Partly it has been about the UK equivalent of Charter Schools, called academies, but on its own this would not have been enough. One of the most important factors has been stronger school-to-school partnerships created by a government program known as the London Challenge. OFSTED (the Office for Standards in Education), which inspects all schools in England, commented that "pan-London networks of schools allow effective partnerships to be established between schools, enabling needs to be tackled and progress to be accelerated." The partnership approach in London included networks of experienced school leaders and current headteachers, who formed a pool of 'system leaders' working with schools across London, as well as 'coaching triads' in which lead teachers worked with colleagues from others schools to demonstrate high quality teaching. London's success over the past decade is now receiving global attention.

See www.ofsted.gov.uk/resources/london-challenge

points to examples in East Boston which are already heading in this direction.

Of course there are many school networks and partnerships that exist elsewhere in Massachusetts. Professional Learning Communities[10] have brought schools together to focus on specific topics and subjects. Many of the best Charter Schools are already part of chains operating in different communities in the state. Private sector partners, such as the Achievement Network and Bay State Reading Institute, are also helping to connect schools.

If it is to unleash greater innovation and improvement at a school level, Massachusetts should go further to develop these networks of schools. We will set out more details of how school-to-school and teacher-to-teacher models can support improvements in teaching and leadership in the next chapter. In this chapter we look at the configurations of networks and clusters and how Massachusetts might strengthen its coverage.

All schools in Massachusetts should be part of at least one school improvement network or cluster. We do not think Massachusetts should be overly prescriptive about what these networks and clusters look like. They can and should look very different, in response to the needs of individual schools and the circumstances and context they are operating in. Nor do they need necessarily to be limited by geographical colocation or district boundaries (we outline some of the possible models below.) Any school that chooses not to be part of any professional network should be asking itself why. If its performance is poor, there is no justification for isolationism; if it is good, why not learn more and why not contribute to improvement elsewhere?

One way to think about clusters and networks is to look within districts at the collaboration between elementary, middle and high schools to facilitate stronger pathways for individual students. MassInsight, which recently published a paper calling for the establishment of stronger school networks,[11] argues the case for this type of collaboration, particularly for large urban districts. The authors point out that one of the critical deficiencies of the current model is:

> "*…the almost total lack of vertical integration and articulation between high schools and middle schools, particularly in cities with lots of choice. How many middle school teachers are deeply familiar with the high school curriculum they are preparing students for – and meet with high school teachers to assure a seamless hand-off of their students to 9th grade?*"

What MassInsight is advocating is very different from the way the district traditionally operates. They propose schools and faculty learning from each other, rather than from a district official. While closer integration between elementary, middle and high schools is undoubtedly vital, their focus is often on issues of transition between these schools.

For teachers to learn effectively from one another we would argue that lateral partnerships among schools serving students of similar age and background are also vital. This is true especially for high schools in the many districts where there is only one high school. In these cases, schools will need to look beyond their own district for high schools with which to form partnerships. The new District Analysis and Review Tools[12] already allow schools to identify others with comparable characteristics in the state and therefore the high performance from which they could learn.

As these clusters and networks develop and it becomes clear which are having most beneficial effects, we also think there will be a case for looking at more formal structural partnerships that might establish shared leadership and governance across schools. We see examples of this already within the Charter sector, where the most successful Charter schools have expanded under the same overall organizational and management structures, with successful principals taking on responsibility for more than one school. The idea of Charter-like chains, in effect growing from among traditional public schools, has tremendous potential to unleash greatness, and in the next chapter we will consider how the best leaders can be identified and incentivized to take on these system leadership roles. Creating such formal partnerships or formal federations between schools will require new forms of district governance where these partnerships exist across more than one district.

The idea of Charter-like chains, in effect growing from among traditional public schools, has tremendous potential to unleash greatness.

There are some districts and schools where it will be more difficult to access the support of other schools, or where the challenges are so great that more is needed than can

be provided from within the school system. In these cases, partnerships with school support organizations will continue to play an important role, enabling schools to pool their resources to purchase what they need from whomever they feel is best placed to provide it or, in the case of Turnaround schools, from a proven Turnaround provider.

A changing role for school districts

If all schools are given greater autonomy and responsibility for their own improvement and are working collaboratively together through formal and informal partnerships and clusters, the role of many districts will need to change radically. Districts should be less involved in the details of implementation and less prescriptive about how to achieve improvement, but simultaneously much stronger on holding schools to account for improvement and much more capable of intervening where needed to act as a champion on behalf of students and parents.

Some districts have already started to make this shift. The Center on Reinventing Public Education has described this as a move to 'portfolio districts,'[13] see the box on the next page for a description of the main features.

These portfolio-type models reflect developments we have seen in the changing role of districts (or district equivalents) in other countries. Michael Barber's previous research with colleagues into the most improved school systems in the world identified a critical role for what they called the 'middle tier' in the school system.[14] They identified four common functions for the middle tier:

- to provide targeted support to schools and monitor compliance
- to facilitate communication between schools and the center
- to encourage inter-school collaboration
- to moderate community resistance to change by making the case for a different future.

It is worth noting that even within the Charter sector, where schools already have greater autonomy, the best Charters are typically part of larger Charter Management Organizations (CMOs) which take on many of the functions that might have been played by a district central office. Sometimes this is simply a question of efficiency – for example, managing technology infrastructure often involves economics of scale across a group of schools. But in other cases CMOs play an important role in the identification and sharing of best practice across schools. The role and organization of CMOs could provide district leaders with further inspiration and ideas for reform.

In the US, the biggest shift in this direction so far has been in large urban districts. In Massachusetts, Boston and Lawrence are the two districts that have come closest to developing a portfolio-type approach. In Boston, as we saw above, some clusters of schools have already been established, a range of school types and models exist, and the city has just announced that all schools will be given the same freedoms and flexibilities as Turnaround schools.

Lawrence has gone further still. It was the first district to be placed into Level 5 and State Receivership in 2011. Since then, it has implemented a radical Turnaround plan with the support of the DESE. The main features of the Turnaround effort have been to push control over schools from the central office down to the school level. There has been a major stripping back of resources and responsibilities at a central office level, and new providers and partnerships have been brought into the district to support the efforts of individual schools. The district has also implemented a new teacher evaluation and compensation system tied to performance and additional responsibilities which we will look at further in Chapter 4.

It is too early to proclaim the Turnaround effort in Lawrence an irreversible success, but the early signs are encouraging. The MCAS results from 2013 show some positive signs, especially in math. At individual school level, some of the gains have been remarkable: 10th grade students at Lawrence Business Management High School, for example, posted the biggest ever increase in math proficiency –from 41% of students in 2011-12 to 63% in 2012-13. The school had been supported by an external partner, Match Charter Schools, which provided additional capacity to implement a new math tutoring program.

The state's intervention in Lawrence shows the power of using the resources in schools across the Commonwealth to support improvement in some of the most challenging schools. It supports our argument that stronger school-to-school partnerships should be a key feature of the future delivery system, although this is an example where the peer-to-peer collaboration has been between schools from one district and others from higher performing schools across the state. We recommend that other districts look closely at the lessons learned from the approach to reform in Boston and Lawrence.

CHARACTERISTICS OF Portfolio School Districts

1. **Good options and choices for all families** – which involves the active recruitment of new school operators and expansion of successful ones of all school types
2. **School Autonomy** – all schools have freedoms over recruitment of staff, control of the school budget and pay, and curriculum and professional development needs
3. **Student Based Funding** – funding following the learner and high percentage of funding distributed from districts to schools
4. **Development of Talent** – developing the pipeline of principals and teachers and the most effective teachers, extending the reach of strong leaders and teachers
5. **Range of school support** – district no longer the monopoly provider of support with schools and groups of schools free to commission from independent providers
6. **Common performance reporting** – all types of schools are subject to the same performance assessment and same criteria for expansion, intervention and closure
7. **Public Engagement** – active management of parental feedback and concerns, greater transparency and information and a public schedule for school closings and openings

http://www.crpe.org/sites/default/files/%20brief_Portfolio_comprehensive_all_components_0.pdf

Furthermore, these models and approaches should not be limited to large urban districts. Rural and smaller suburban districts should also examine new operating models and ask themselves how they could make equivalent models of school-to-school improvement work. Given their size, this would usually require greater collaboration across district boundaries and would therefore entail reexamination of existing models of district organization and governance. Does each small district need its own superintendent, for example? Could school committees carry out some of their functions on a collaborative basis with other school committees? Are there back office functions that could be shared across districts and which could be added to the existing regional collaborative models, thus releasing more resources at school level? Through greater promotion of school choice and open enrollment, could more parents take advantage of the opportunity to choose schools in neighboring districts?

We recognize these are difficult and politically sensitive decisions, which is why we do not propose a single model for districts across the Commonwealth. However, almost no one defends the existing arrangements, which are costly and far from efficient. We believe consolidation and partnerships between smaller districts will be necessary if these smaller districts are to realize the full benefits of school to school partnerships that we believe will be a key driver of further improvement.

To achieve the outcomes described above, we recommend that the state establish and fund a new competition to promote innovative proposals for district redesign and reform. The competition would be open to all districts – urban, suburban and rural. The competition should not start with a singular view of what a redesigned district should look like. Contestants might propose useful revisions to the structure and operation of portfolio districts for example, or they

might develop significant variations to this model. Smaller districts may propose a model for inter-district collaboration that will both increase efficiency and create productive pedagogical synergies.

Educators and school administrators should devote the same energy to district redesign that has been invested in redesigning schools in recent years. For this reason, the legislature should tie any additional funding for districts in the next two (or more if necessary) financial years to the development of acceptable proposals for reform. The state could use the model of other competitive processes here, such as the establishment of Innovation Schools and the recent Grant Process for the Integrating College and Career Readiness Demonstration Initiative. On the next page, we set out some of the considerations for developing an effective competition process.

The role of the State Education Authority

At a state level there is a need for the Commonwealth to be clearer about what role it wants the DESE to play, and what it should stop doing. Throughout our interviews we have been told that the state is trying to do too much, and especially that it is making too many, often redundant, demands for compliance. Many of these demands come directly from the legislature or federal government – DESE has identified 101 plans that are required of districts and 98 reports that are required on an annual basis from districts. Many of these individual reporting requirements are made for a perfectly good reason, but their cumulative effect places a heavy burden on districts and schools. The case we have heard loud and clear is that the state needs to differentiate its approach more, to take account of differing levels of performance and of different socioeconomic circumstances as well as size.

We also heard many positive comments about the strengths of the DESE during our work, upon which Massachusetts should clearly look to build. On the whole, stakeholders were positive about the accountability system and the assistance the DESE provides to districts and schools. They were also positive about the moves it has made to share greater amounts of data, to make district and school performance much more transparent and to give educators the tools they need to examine their own performance more closely. The delivery approach to the Race to the Top reforms – which we have seen firsthand – has been beneficial to the DESE, both in prioritizing and driving reform forward and in providing feedback loops to the Department.

> Rural and smaller suburban districts should also examine new operating models and ask themselves how they could make equivalent models of school-to-school support work.

In relation to the concerns raised that the state does not sufficiently differentiate its approach to districts, one of the consequences is that the state is seen to impose the same regulatory and compliance burden on all districts, from the most successful to those that evidently need greater levels of support. This excessively bureaucratic approach, we have been told, distracts districts and schools from their central tasks and stifles the ability of districts to drive their own improvement or to innovate. While to an extent this may be a function of US Department of Education regulation and the requirements placed on all districts in relation to the implementation of the new state standards and teacher evaluation system, this is certainly not the whole story. Moreover, with the current possibility of waivers from the US Department of Education, it is no longer credible to lay all the blame on federal requirements. If the state wants to create a more enabling approach in which it frees the best districts and schools to innovate and act as the drivers of improvement across the system, it will need to change its own approach.

A big part of the answer lies with the legislature. Instead of demanding that detailed information be collected from districts and schools on a range of separate funding and policy initiatives, it should instead be demanding sharper evidence both of the results delivered and of productive use of public money. (See Chapter 7 for our proposals on funding and productivity.) If the state were to pool a number of these funding streams around specified outcome goals and significantly reduce the reporting burden on districts, it could free up resources and shift the focus to performance rather than compliance. We recommend that DESE should work with the legislature to identify all current statutory and reporting requirements, with the aim of eliminating any non-essential requirements and combining any duplicative requirements.

Such an approach would also allow DESE to focus more of their conversations with districts and schools, away from compliance and monitoring, to what should always be the central question: what would really bring about major gains in teaching, learning and student outcomes? They could strengthen this focus further by scheduling routine half-yearly performance reviews – what we call 'Stocktakes' – that perform both an accountability and support function. These routines will depend in a large part on increased availability of real time data about student progress. We think the Stocktakes should be based on both performance and size, so that the largest districts are receiving the greatest scrutiny but all districts know they have some possibility of having their performance examined during the course of a year. In these Stocktakes, the dialogue should focus on outcomes, and on how the state can change its requirements, and find new channels and services to help districts and schools to deliver those outcomes.

In addition, in an era during which resources are significantly constrained, it is incumbent on the state authority to control its own costs as far as it is able, consistent with the strategic, support and monitoring role it should play. The number of staff at the DESE supported by state funds is already at its lowest level for ten years and represents only 0.5% of the total K–12 budget. Indeed much of the capacity the DESE currently has is dependent on federal funding. To retain the capacity it needs in future the agency will need to shift resources away from compliance and monitoring role to staff who are capable of intervening where required, and very much in touch with the field. The routine half-yearly

DEVELOPING A district redesign and reform competition

The state should support districts in developing their initial proposals by holding a series of design workshops where districts can discuss and share ideas. District proposals should be transparent and publicly available, and a key condition of support for any proposal should be that it has the support of the School Committee and there is evidence that the local community and stakeholders have been consulted. In developing the criteria for judging the proposals, a starting point should be the seven areas which the Center on Reinventing Public Education identified for portfolio districts and which they have been using to assess the progress being made by districts signed up to the portfolio approach across the country[15].

There should also be a criterion for population size; this would require small districts to collaborate with others. In addition, we would stipulate that districts that do enter would be required to commit to open enrollment across district boundaries. Proposals could be assessed and judged by a panel consisting of the DESE, business representatives and higher education leaders. Only a small number of proposals from districts might be successful initially, but other districts should learn from the process and continue to share in the learning that emerges during implementation. Over time, this would enable Massachusetts to develop its own alternative models of governance and administration from within the state and thus enable the development of forms fit for the 21st century. Solutions to a problem that has long bedeviled school reform in much of the US might thus be found in Massachusetts.

dialogue with districts we have proposed should be matched by regular communication with other representatives of the field about both system performance and perceptions of the authority's effectiveness, which should be independently surveyed annually.

There remain a number of critical functions for which the DESE must retain responsibility, and arguably strengthen its capacity.

The state should ensure districts and schools both raise and receive adequate funding in a timely fashion, and the state should strengthen its capacity for ensuring the efficient use of public funds by more closely examining the productivity of district and school spending. We will look at the implementation of the statewide funding system in more detail in Chapter 6.

- The state must maintain the statewide system of accountability for all schools. The state's role is to ensure high quality assistance is available, but not necessarily to provide it itself.
- The state should play a more active and strategic role in the identification and promotion of talent amongst teachers and leaders, as discussed in the next chapter.
- The state should ensure the collection, analysis, use and publication of the ever greater amounts of information on student and school performance that the world of big data is beginning to make possible.
- The state has a key role in scanning the horizon, nationally and globally and, from that, informing the development of strategy and policy.

In short, the state has a responsibility to create the conditions for success.

If there is agreement that this is the correct ongoing role for the DESE in a more autonomous and self- improving school system, it raises some questions: What type of staff does the Department need? What level of resources will it require going forward? It is beyond the scope of this study to look at these questions in any detail, but we might reasonably expect the number of staff in compliance and monitoring roles to reduce, thus freeing up more resources to work directly with districts and schools. We recommend DESE should commission an independent study of how its role will change in the coming years – perhaps by experts outside of the education field – to make more detailed recommendations for its future organization and scope of responsibilities. We expect the end result would be a more powerful state agency focused on the future.

Conclusion

We have argued in this chapter that to unleash greatness will require significant reductions in regulation from the state and districts and, at the same time, greater autonomy for schools so that principals and faculty can take responsibility for their own improvement. Massachusetts could immediately extend flexibilities and freedoms to all schools and eliminate the Charter Cap. In the longer term, systemic innovation will be provided by the development of new models of school clusters and district governance. These can begin to be developed and incentivized more strongly through a district reform competition, but full implementation will happen in the next phase. A summary of our main recommendations is shown on the next page.

Endnotes

1 OECD, Strong Performers and Successful Reformers in Education – Lessons from PISA 2012 for the United States, 2013

2 For a full list of the freedoms see www.does.mass.edu/apa/sss/turnaround/level4/CH69S1J_summary.pdf

3 For a full list of freedoms available see www.mass.gov/edu/docs/2010/20101020-autonomy-flexibility.pdf

4 B. Lane, C. Unger and L. Morando Rhim, Emerging and sustaining practices for school turnaround, April 2013

5 CREDO, Charter School Performance in Massachusetts, February 2013

6 James Vaznis, "After years of decline, Trotter School rebounds," The Boston Globe, December 2, 2013

7 D. Hargreaves, Creating a Self Improving School System, July 2010

8 See Robert Hill, Achieving More Together: adding value through partnerships, 2008 and Richard Dufour and Michael Fullan, Cultures Built to Last, 2013, for example.

9 M. Contompasis, Reimagine, rather than patch, Boston schools, Boston Globe, Opinion 2 November 2013 (http://www.bostonglobe.com/opinion/2013/11/01/don-patch-boston-school-system-reinvent/APOUfhD6Z1GCApNKJK0u1N/story.html)

10 See www.doe.mass.edu/apa/ucd/plcguidance.pdf for more details of this approach

11 MassInsight Education, Smart Districts: Restructuring Urban Systems from the School Up, Fall 2013

12 See profiles.doe.mass.edu

13 P. Hill, Center on Reinventing Public Education, Characteristics of Portfolio Districts

14 M. Mourshed, C. Chijioke and M. Barber, How the Worlds Most Improved School Systems Keep Getting Better, 2010

15 P. Hill, Center on Reinventing Public Education, Characteristics of Portfolio Districts

RECOMMENDATIONS

By 2016 Massachusetts should:

- Extend Turnaround freedoms to all schools and remove the Charter cap to promote the expansion of proven providers that want to operate in low-income neighborhoods.
- Run a district design competition to develop new models of district governance consistent with the emphasis on school autonomy, and tie any additional funding for districts in the next two years to the development of acceptable reform proposals.
- Ensure DESE and the legislature identify all current statutory and reporting requirements, so they can eliminate non-essential requirements and combine any duplicative requirements.
- Introduce routine, focused performance Stocktakes between districts and the DESE.
- Undertake an independent study of the future role and functions of the DESE.

RECOMMENDATIONS

By 2020 Massachusetts should:

- Ensure every school is part of at least one effective school-to-school cluster or network.
- Ensure districts have shifted to a new role with many more having established cross-district partnerships and governance that supports new school-to-school partnerships.
- Ensure the DESE has shifted to a clearer, more strategic leadership role with an even sharper focus on value for money and on providing access to an increasing amount of big data.

CHAPTER 4

WORLD CLASS TEACHERS AND LEADERS

MASSACHUSETTS SHOULD:

- Review teacher preparation across the state and develop a more diverse range of teacher preparation providers.
- Radically reform professional licensure and teacher tenure.
- Develop new arrangements for identifying and deploying Advanced and Master teachers.
- Develop new models of in school and school-to-school professional development.
- Establish a new statewide contract between the state and teacher unions.
- Introduce a new approach to the identification and development of future principals and create new opportunities for the most effective principals to influence the school system.

In this chapter we focus on the most important drivers of improved student outcomes: teachers and principals. Evidence shows that the quality of teaching and the quality of school leadership are the two most important factors affecting student learning. Seminal research from Tennessee[1] shows that if two average eight year old students were given different teachers – one of them a high performer, the other a low performer – the students' performance would diverge by more than 50 percentile points within three years. Other studies show that high-quality instruction can substantially offset disadvantages associated with low socioeconomic status.[2] Successive international benchmarking studies, such as PISA and TIMSS, have shown the importance of recruiting and retaining great people in the teaching profession and ensuring they develop their skills constantly.

The international evidence is clear: top-performing countries are very effective at recruiting teachers from among the top graduates and at preparing and developing them for ongoing success in the classroom. Previous research into the world's best performing school systems[3] shows that most of the top-performing countries recruit their teachers from the top third of their graduates, whereas the United States only recruits a quarter of its teachers from the top third, and for high poverty schools this figure decreases to less than one sixth.[4]

Making the profession more attractive to the best graduates is therefore vital, and while pay is one factor in this, the evidence shows a number of other factors are at least as significant, if not more so. These include the views of prospective teachers about the ambition of the profession they will be joining, the quality of the principals they will work for and their opportunities for career development and progression within a professional community. In general, the most talented members of the generation currently in its twenties seek roles in which there are opportunities to learn and develop in the workplace through mentorship and collaboration, rapid career progression on the basis of performance, and above all the chance to make a difference to the world around them.[5] The teaching profession, properly reformed and presented, should be highly attractive in these terms, and the success of experiments such as Teach for America and Teach First in the UK reveals the potential.

The PISA 2012 results show that many of the countries which have improved their performance – Estonia, Poland, Brazil, Colombia, Japan, Mexico and Israel among them – have done so by focusing on improving the quality of their teachers. The policies they have chosen to pursue include:

- "increasing the requirements for earning a teacher license;
- providing incentives for high-achieving students to enter the profession;
- raising salaries to make the profession more attractive and to retain more teachers;
- offering incentives for teachers to engage in in-service training programs;
- changing the criteria and benefits associated with teachers' career advancement; and
- creating a culture of continuous professional learning in schools."[6]

The reform agenda in Massachusetts should be seen against this background. The state has already implemented, or is in the process of implementing, a number of reforms aimed at improving the effectiveness of its teachers. These include introducing new regulations for teacher preparation programs, publishing more data about the outcomes from these programs and closing down those with poor results, introducing the Massachusetts Tests for Educator Licensure (MTEL), and implementing a new system of teacher evaluation (the first results of which were published in Fall 2013).

Massachusetts needs to go further and faster in implementing these reforms to develop what Jal Mehta of the Harvard Graduate School of Education calls "a new professionalism" amongst teachers. He argues that the aim should be to put teaching on a par with other professions, such as medicine, which already has high selectivity in determining who can enter the field, plus extensive initial and ongoing clinical training. Developing this new professionalism will, he maintains, entail:

> "*…developing a much larger stock of practical knowledge about how to teach, creating effective training regimens to inculcate that knowledge, and building ongoing organizational processes to ensure that knowledge is consistently applied.*'[7]

We strongly agree, and in this chapter we will set out how Massachusetts could develop each of these elements.

Transforming teacher preparation

The teacher effectiveness pipeline starts with the attraction and preparation of strong candidates for teaching positions. Currently, for most people entering the teaching profession in Massachusetts, this still means going through an education school – approximately 90% of teachers trained in Massachusetts attend university-based programs.[8] If the aim is to significantly improve the quality of teachers entering the workforce, improvement of these traditional teacher preparation programs is essential.

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Concerns about the quality of teacher preparation programs have been expressed for many years. We heard these concerns loud and clear during our consultations. The National Council on Teacher Quality (NCTQ) published a review in 2013 which evaluated 35 teacher preparation courses at the 14 different institutions in Massachusetts where there was sufficient information to reach an overall score. Together, these institutions provided 50% of the state's traditionally trained teachers. Only the undergraduate secondary education programs at Fitchburg State University and Gordon College achieved three stars out of a possible four. Programs at three institutions scored zero stars and a consumer warning from the NCTQ. A summary of scores for elementary and secondary education teacher preparation raised concerns about selectivity in admissions, early reading instruction, elementary math and the quality of the student teaching experience.[9] It is not just the NCTQ study which raises concerns. Massachusetts' own data shows considerable variation in the outcomes achieved by graduates from teachers prep programs across the state.

Thanks to the NCTQ and others, we know that effective teacher preparation programs should:

- Attract people who majored as undergraduates in subjects they wish to teach.

- Focus more on clinical practice rather than pedagogical theory.
- Admit applicants selectively.
- Use data to track their graduates' performance and refine their approach to development.

Evidence from the UK, where there has been real progress on teacher preparation over the past decade, suggests we should add to this list ensuring that the student teacher spends a good deal of time actually working in classrooms with good mentorship and support from successful and experienced teachers. The schools where they gain this experience should be involved in the assessment of the student's fitness to practice. This is also the case in top-performing countries such as Singapore.

Some teacher preparation programs in Massachusetts already demonstrate some or all of these features. The challenge now is to ensure all programs match the standards of the best. The state has already signalled its intention to introduce a new process of program approval and to publish much greater detail about the outcomes from teacher preparation programs – such as educator evaluation ratings, program graduates impact in producing growth learning employment and survey data.[10] But the state needs to go further and faster to bring about the radical improvement in performance needed and the bar should be set unapologetically high.

Current plans for reviewing teacher preparation programs are that existing providers should have their programs reviewed every seven years, unless concerns are raised by the published data, in which case an interim review would take place. Given the need to accelerate progress in the improvement of teacher preparation, we recommend the DESE and the Department of Higher Education should undertake a more urgent and thorough approach to program reviews, making the process as robust as possible. We recommend every teacher preparation program be reviewed within a three-to-four year period against a stringent rubric defining quality. The best teachers and principals from around the state should play a principal role in the review teams. Reviewers would need to be trained, and perhaps compensated, to fully professionalize this process and ensure it provided the necessary consistency and leverage.

> Massachusetts should look to diversify the range of providers of teacher preparation and provide stronger incentives for the best districts and schools to take a lead in this area.

In the longer term, more radical reform of teacher preparation is needed, and Massachusetts should look to diversify the range of providers of teacher preparation and provide stronger incentives for the best districts and schools to take

CASE STUDY:
The Sposato Graduate School of Education

Founded by Match Education in 2012, this innovative teaching preparation program is based on a two-year course in which students spend their first few months receiving intensive coursework and coaching before being assessed for their readiness for classroom teaching. Candidates who successfully pass through this gateway spend six months teaching and being observed by a coach before moving into a full time teaching role in their second year, during which they receive substantial ongoing coaching.

a lead in this area. There is already at least one example of what this future might look like.

This type of innovative teacher preparation shouldn't be limited to the Charter sector. The state should be looking at how it can incentivize the best schools, Charter or not, to play a greater leadership role in delivering teacher preparation, through partnerships with higher education. An apprenticeship model of teacher preparation, similar to that used by top consultancies and other professional services organizations, has huge potential. At its core is the specification of what good looks like and coaching to attain it. Teaching – which is at its heart a performance, as sport and drama are – lends itself to the use of video recordings and step-by-step analysis of what worked and what didn't. We are not saying theory should be abandoned for practice; rather the two should be combined and everything rooted in the daily experience of working in a school. These partnerships between schools and higher education could also be at the forefront of developing innovative new approaches to teaching –new pedagogies that will be needed to embed deeper learning across the system. An example of schools providing greater leadership in the training of teachers is provided by the case study of Teaching Schools in England below.[11]

The Rennie Center for Education Research and Policy has set out a similar partnership based model for teacher preparation for Massachusetts[12]. We think their proposals could form the basis for a Massachusetts equivalent of the Teaching Schools program. The Rennie Center paper estimates that these partnerships might have startup costs of $50,000-$100,000, which is in line with the level of startup funding Teaching Schools received annually in England over

CASE STUDY: Teaching Schools in England

In 2010, the government in England introduced a new role for some of the country's best schools. Teaching Schools are based on the model in medicine of medical training hospitals. The schools – which remain normal working schools for students – work in partnership with higher education institutions to lead the process of training for new teachers, providing much stronger links to the classroom and on-the-job training. Schools in England applied to become teaching schools through a rigorous process, and 300 have so far been designated across the country. The government identifies 6 key roles for them:

- Organizing and coordinating the training of students who want to become teachers.
- Providing and brokering support for other schools to improve.
- Offering professional development training to other teachers.
- Leading research and development projects across a group of schools.
- Appointing some of the best teachers in local schools to become 'specialist leaders of education' who offer support to other schools.
- Developing future leaders by organizing leadership development opportunities.

a three-year period. Beyond this period, Teaching Schools in England are expected to finance themselves by charging other schools for their services. We would recommend that Massachusetts invest in creating at least one new partnership-based model for teacher preparation in each region of the state within two years.

Redesign teacher licensure and tenure

Strengthening teacher preparation programs and developing innovative models should help to ensure more teachers arrive in schools better prepared to be effective educators, but however good the preparation, it can only provide the starting point for a career of professional learning. Evidence from top-performing countries shows that systematic support and development of teachers in the early years of their career is also essential for future and continuing success. The highest performing countries such as Japan, Singapore and South Korea are highly effective at supporting teachers when they first arrive in the classroom by pairing them with strong mentors.

We have seen this too in the most effective schools in the US, including among high performing Charter chains. In these schools, teachers master the full repertoire of professional skills before they progress. If Massachusetts is to become the most successful education system in the world, it will need to ensure this happens routinely and effectively to every new teacher in every school.

The second stage of the teacher effectiveness pipeline is therefore what happens to teachers on their entry to the school system and how clear the pathways are for them to progress. At the moment, teachers in Massachusetts can achieve an initial license for five years providing they have completed an approved educator preparation program and passed the requirements of the Massachusetts Tests for Educator Licensure (MTEL).

Teachers can then obtain a Professional License valid for five years, providing they have completed three years of employment under an initial license and have completed an approved teacher induction program. Beyond that, teachers achieve re-licensure every five years on the basis of having completed a certain number of professional development courses.[13] None of these hurdles demands hard evidence of successful professional practice or delivery of results, and consequently most teachers advance through their careers through compliance rather than through demonstration of professional competence or evidence of impact on student performance.

To bring about a transformative change in the quality of its teaching workforce, we believe the state should raise the bar for teachers to progress and achieve a Professional License. One option would be simply to raise the entrance requirements for teachers. However, this might rule out a number of teachers who go on to become highly effective educators. We instead recommend that Massachusetts raise the bar on what it takes to achieve a Professional License after teachers have had the opportunity to demonstrate their effectiveness. At the moment, the only requirement here is three years' experience and completion of the teacher induction program. There is nothing that attempts to link this assessment to a teacher's demonstrated effectiveness in improving student performance and the views and feedback of proven and effective teachers and leaders.

These new requirements should include:

- At least two consecutive years of being judged at least proficient under the new Teacher Evaluation system.
- Positive feedback from teaching observations by exemplary teachers or principals.
- Submitting a portfolio that sets out their range of teaching experiences and impact of the teacher on his or her students over the previous three years in terms of improved performance.

Most teachers advance through their careers through compliance rather than through demonstration of professional competence or evidence of impact on student performance.

These criteria should also be benchmarked against the standards and requirements for teachers to achieve tenure in other high-performing systems around the world. We suggest establishing a taskforce of experts, including those outside of education, to develop these new standards over the next year so that it could be in place by September 2015.

If the explicit goal is to create the best education system in the world, who becomes a teacher and how teachers are inducted into the profession are first order priorities that need to be addressed urgently. After all, many of those recruited into teaching in 2014 or 2015 will be at the heart of the profession in 2030.

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Once the new criteria are in place, teachers who failed to meet the new requirements after five years would lose their initial license to teach and be ineligible to apply for another one. Making it harder to become a tenured teacher would send an important signal back down the system and hopefully start to change behavior – prospective teachers would become more demanding of their education schools and ask more from their own professional development. It would be easy to see which education schools had the best success rates in teachers achieving these new standards. Above all, it would be a statement to successful teachers that their profession is one that the state, and the citizens of Massachusetts, takes very seriously indeed.

Strengthening progression routes and using the best teachers system-wide

Although important, it will not be enough simply to recruit and develop a group of talented educators. The evidence from PISA also shows that the highest performing systems ensure their most effective teachers and leaders work in the most challenging schools. This would seem to be common sense, but is not the case in the US (or the UK, for that matter). The evidence suggests that in general the reverse is true, with the best teachers and principals often concentrated in the most comfortable circumstances, often as a result of seniority rules which allow the most experienced teachers to choose to work in the least challenging schools. In Massachusetts, high poverty schools still have nearly 10% lower retention rates than low poverty schools, and are almost twice as likely to have waivers for teachers assigned to teach subjects outside their licensure.[14] Finding powerful new ways to incentivize the state's best teachers and leaders to work in the most challenging schools is vital.

One option would be to offer financial incentives to teachers to teach in the lowest performing schools. A recent randomized experiment study, conducted by Mathematica and implemented in ten school districts in seven states, tracked the impact of paying a $20,000 bonus to teachers to remain in a low performing school for two years. This research showed that districts were able to fill the vast majority of vacancies, and that transfers had a positive impact on test scores at an elementary level. The payments helped increase retention rates for the immediate two-year period, but after that these teachers were no more or less likely to leave these schools.[15]

Other high-performing countries incentivize their best teachers to teach in the lowest performing schools by tying this service explicitly to their progression. Recognized for their effectiveness, these teachers are then used system-wide to help increase other teachers' effectiveness. In Singapore, for example, teachers' careers are carefully planned, and they are expected to undertake a number of different placements including in some of the most challenging schools. Master Teachers are also deployed to work across the system in other schools and to mentor and coach other more junior teachers. There are already a number of districts in Massachusetts developing clearer pathways for teachers and doing more to recognize and use the best teachers.

The state should work with and support other districts to develop a similar process of identifying Master and Advanced Teachers. Implementation of the new teacher evaluation system will help to identify teachers who are exemplary performers, and the state should ensure all schools are using a common rubric for assessing the performance of teachers and identifying good practice. Districts might want to set additional criteria, equivalent to Lawrence's requirement that teachers submit a portfolio of their experience to date. The criteria could also be set in such a way that they incentivize the best teachers to work in the state's most challenging schools. For example, it should be a requirement for anyone applying to become a Master Teacher to have evidence of having worked successfully for at least a year or two in a school with a high proportion of low income students, and for anyone seeking to retain the designation as a Master Teacher, that the teacher periodically support such a school. For teachers who operate in districts where there are no schools with a high proportion of low income students, this may mean them moving to

another district for a period of time – effectively a secondment of these teachers from wealthier districts to lower income districts.

The state and districts will need to identify the potential roles of Master Teachers system-wide. They should consider some or all of the following:

- supporting and coaching individual teachers in other schools and districts as well as their own;
- participating in program reviews of teacher preparation programs;
- undertaking observations and assessments of teachers applying for a professional license; and
- leading professional development activity across a group of schools as well as in individual schools.

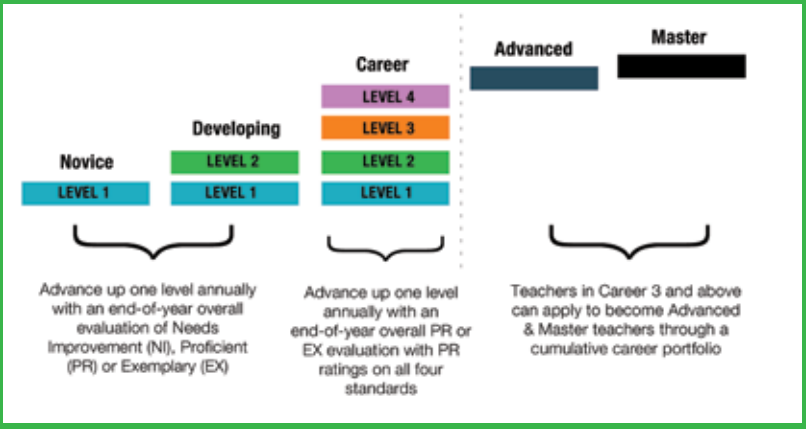
Of course in some districts there will not be enough Master Teachers to undertake all these roles, which is in part why the previous chapter recommended that districts look to work across their own boundaries by forming partnerships with other districts to access this support.

Shift the focus of professional development from the district to the classroom

Reforms to the current system of teacher preparation and development, and to the deployment of our most effective teachers, however well implemented, are unlikely to be enough when the very nature of teaching will look dramatically different in the next ten, let alone twenty, years. Massachusetts needs to ensure its current teachers are developing new and innovative approaches to teaching – what Michael Fullan and Maria Langworthy have called the

CASE STUDY:
Lawrence's Career Ladder for Teachers

Lawrence has created a new career ladder system with performance-based advancement that replaces the old step, lanes and longevity requirements. This means there is no automatic pay raises for teachers – performance counts! The steps in the process are shown in the diagram below and include the opportunity for experienced teachers – those who have served for five years and who have progressed up the ladder each year – to apply to become an Advanced or Master Teacher by submitting a portfolio of their work. The portfolio requires approval from the superintendent and will include student growth data over time; endorsements from peers, parents, students, and administrators; and evidence of effective instruction.



Source: Update on Lawrence Public Schools Turnaround Plan: Briefing for the Board of Elementary and Secondary Education, April 22, 2013

> Massachusetts needs to ensure its current teachers are developing new and innovative approaches to teaching – what Michael Fullan and Maria Langworthy have called the "new pedagogies".

"new pedagogies".[16] These are approaches based on strong learning partnerships between and among students and teachers which combine the learning of knowledge, collaborative application of that knowledge to real and important problems, and the use of technology as a tool for collaboration, research and monitoring progress.

The international evidence is clear: teachers learn most effectively from observing other teachers and seeing them in action in the classroom.[17] Yet much professional development in Massachusetts still takes place outside the classroom, with teachers expected to attend professional development courses. This is common elsewhere in the US, too. For example, most American teachers received the majority of their professional development in workshops of eight hours or fewer over the course of a year.[18] There needs to be a fundamental shift in professional development away from districts to schools and teachers learning with and from the best teachers in schools – in other words to professional development built into the working day and the working week.

There is another reason why models of within school and school-to-school professional development make sense. As the pace of technological change accelerates and new possibilities emerge for combining effective pedagogy with using technology, schools will be the place where these innovations emerge, and it will be even more challenging for those outside the day-to-day school environment to keep pace with this change. These new models of professional development, which have immense potential to professionalize teaching at the level of pedagogical detail, will help the rapid spread of this emerging practice across and between schools and teachers. Massachusetts should place itself at the forefront of these exciting developments.

What does this mean for Massachusetts? First and foremost, it means breaking down the isolation of teaching and ensuring that teachers collaborate actively and routinely in their own schools and in other schools to examine what is working, what isn't and why. The new models of networks and clusters of schools described in the previous chapter are crucial to enabling this to happen, and Massachusetts has already made progress in implementing Professional Learning Communities with this aim. The state should now build on this development to make school-to-school collaboration the norm, with schools and teachers sharing lesson planning, lesson study, assessment of student work, learning walks and other action research approaches. In doing so, it can learn from the experience of other systems including Ontario where within school and between school collaboration on professional practice has become the norm, and Singapore where one of many impressive aspects of the system is the way teachers explicitly review sequences of teaching together to see how they can be improved.

In most schools this will mean creating more time during the school day and school year for teachers to have the time to work together. In the top-performing countries, teachers typically have time built into their professional day for collaborative planning time and for observing or watching other teachers teach – see the case study from Japan on the next page. The most effective Charter schools already do this, but too often in public schools teacher contracts are a barrier to using the school day in this way. This is clearly a mistake from the point of view of teachers as well as students. Developing teacher contracts focused on building evidence-based practice – as some districts and charter chains have already done – is likely to be essential. This is another reason why we support the efforts of the Extended Learning Time movement to reexamine the current school schedule and expand the time available for teachers to spend time with other teachers.

As the example from Japan demonstrates, technology offers new possibilities here. Imagine, for example, if schools in Massachusetts regularly videoed the best teachers teaching, and that these videos were made available online on a statewide basis. Tom Kane, a professor at the Harvard Graduate School of Education, has already begun to develop experiments along these lines.[19]

> Teachers learn most effectively from observing other teachers and seeing them in action in the classroom.

In Chapter 2 we identified some of the possibilities emerging educational technologies will provide in terms of assessment, and we shall discuss this more in Chapter 5. Here we want to highlight the implications for teachers and teaching. In their paper, *A Rich Seam,* Michael Fullan and Maria Langworthy have begun to describe what this new world might look like, not least because they have already seen it emerging in classrooms in a number of countries.

In the top-performing countries, teachers typically have time built into their professional day for collaborative planning time and for observing or watching other teachers teach.

CASE STUDY:
Japan's Lesson Study Approach to Professional Development

"In Japan kenkyu jugyou (research lessons) are a key part of the learning culture. Every teacher periodically prepares a best possible lesson that demonstrates strategies to achieve a specific goal in collaboration with other colleagues. A group of teachers observe while the lesson is taught, and usually record the lesson in a number of ways, including videotapes, audiotapes and narrative and/or checklist observations that focus on areas of interest to the instructing teacher (how many students volunteered their own ideas, for example). Afterwards, the group of teachers, and sometimes outside educators, discuss the lesson's strengths and weaknesses, ask questions, and make suggestions to improve the lesson. In some cases the revised lesson is given by another teacher only a few days later and observed and discussed again. Teachers themselves decide the theme and frequency of research lessons. Large study groups often break up into subgroups of four to six teachers. The subgroups plan their own lessons but work toward the same goal, and teachers from all subgroups share and comment on lessons and try to attend the lesson and follow-up discussion. For a typical lesson study, the 10-15 hours of group meetings are spread over three to four weeks. While the school day for students ends between 2:40pm and 3:45pm, teachers' work days don't end until 5pm, providing additional time for collegial work and planning. Most lesson study meetings occur during the hours after school. The research lessons allow teachers to refine individual lessons, consult with other teachers, get colleagues' observations about their classroom practice, reflect on their own practice, learn new content and approaches, and build a culture that emphasizes continuous improvement and collaboration."[20]

L. Darling Hammond, R. Chung Wei, A. Andree, How High Achieving Countries Develop Great Teachers, 2010.

The chart below from their publication gives a flavor of what is to come and what should be avoided.

Effective vs. Ineffective New Pedagogies

It is worth reinforcing a couple of key messages here. First, what is transformative is not the technology on its own, but the combination of new pedagogical practice with technology. This is a theme we shall return to in Chapter 5. Second, as Fullan and Langworthy emphasize, success in this new world requires high levels of pedagogical capacity and the ability to learn continuously from feedback and improve practice still further. These are good examples of the need for the state to unleash greatness rather than mandate adequacy – it is unimaginable that the new pedagogies will be developed in government bureaucracies or indeed anywhere other than in classrooms by great professionals working in concert. The role of government is to lift the barriers to transformation and simultaneously encourage it by creating the right context.

A new grand bargain between the state and teacher unions

The current relationship between the state and teacher unions in America's public school system emerged largely in the 1960s and 1970s, based on the model of industrial unions. In their analysis of teacher unions in the US, Kerchner and Mitchell[21] described how, by the 1980s, in most of the country the relationship between unions and their employers, the school districts, had moved from a 'Meet and Confer', or consultative relationship, to a 'Good Faith Bargaining' phase in which the assumption was that teachers and their employers had conflicting interests and therefore needed to a negotiate contracts which hammered out the nature of the relationship and provided protection for teachers in relation to compensation, hours and working conditions.

At first this new phase of the relationship provided many benefits for teachers and often enhanced their working lives. However, the rise of standards-based reform in the US in

Effective vs. Ineffective New Pedagogies

EFFECTIVE NEW PEDAGOGIES (high levels of pedagogical capacity needed)	INEFFECTIVE NEW PEDAGOGIES
Establish students and teachers as co-learners	Too much student autonomy
Long-term deep learning tasks; interdisciplinary interdependent tasks	Short-term tasks for one unit or lesson; complex, not multidisciplinary
Deep learning tasks have clear learning goals and clearly defined measures of success	No clear learning goals or ways of measuring success
Give students control and choice suited to their level, gradually building students' capacity to manage the learning process	Give too much control and choice to students before they have skills to structure their own learning effectively
Continuous, effective feedback; formative assessment towards the learning goals	Ineffective feedback or only summative assessment at end of task
Identify and use digital tools and resources to support deep learning tasks and to help students master the learning process	Use digital tools and resources only to deliver content and track progress, but not to inform changes in teaching and learning strategies
Analyze progress data to inform changes in teaching and learning strategies	

EXAMPLE:
A New Grand Bargain between the State and Teachers

- State commitment to maintaining or enhancing the overall funding of the school system over a five-to-ten year period, contingent on the implementation of reforms below.
- A new approach to funding – see Chapter 7 – which is fair and ensures that a much greater proportion of the funding is devolved to school level, thus reducing bureaucracy and ensuring much more discretion over allocation of funds for teachers and principals.
- Appropriate basic compensation based on benchmarking with other professions, and extra reward for extra contribution.
- Career progression based on demonstrated competence, drawing on peer review and evidence of impact on students, not time served.
- Regular surveys of teacher, parent and student commitment and satisfaction which enable comparison across districts.
- Explicit rewards for innovation or for those within teaching who make a contribution beyond their school, especially in the lowest income communities.
- Active involvement of teachers in key processes of the state education system, such as assessing students' fitness to practice at the end of a teacher preparation program.
- An expectation that every teacher or principal who wished to reach the top levels of the profession would serve significant time in more challenging locations.
- Increased learning time for students and increased time for all teachers to participate in collaborative professional development built into the working day, week and year.
- The opportunity for a longer working day and year in return for higher pay.
- The opportunity for higher teacher compensation in return for reduced pension entitlement.
- Performance assessment and same criteria for expansion, intervention and closure.

the late 1980s – in Massachusetts symbolized by the 1993 legislation – posed a challenge to the relationship; if student outcomes were the priority, were the contracts that emerged entirely appropriate? Some unions and districts recognized this tension and tried consciously to move to a new paradigm – described by Kerchner and Mitchell as 'negotiated policy' – in which the assumption of conflicting interests was set aside and both sides negotiated from a shared assumption that student outcomes came first.

Some of these experiments worked, others didn't, but in any case they did not become widespread in spite of the support of Al Shanker, the American Federation of Teachers (AFT) leader at the time. Arne Duncan, the current US Education Secretary, has made strenuous efforts to engage union leaders in dialogue about performance, not least by organizing influential conferences involving education ministers and union leaders from other countries. This has been beneficial, but in many districts, including most in Massachusetts, the old industrial paradigm remains a barrier to successful reform. There is also the growing pressure on public finances and the realization that the economic commitments in some of the union contracts, such as those concerning pensions, act as long-term constraints, with the consequence that the current generation of teachers and students in effect pay the price for preceding generations. The era of austerity has only sharpened this challenge. Moreover, the contracts tend to assume a 20th century model of schooling, with a single teacher in front of an unchanging group of students, often placing restrictions (such as on class size) that become increasingly irrelevant as blended learning environments become the norm.

In the short term, we think the legislature needs to take action to change the nature of the relationship and remove some of the barriers that are getting in the way of reform. One important step should be the establishment of a statewide union contract that establishes the terms of employment, negotiated with the teachers unions who represent the great majority of Massachusetts teachers, that will significantly reduce the scope of negotiations between unions and local schools and school districts. The ideal would be a 'thin contract' – to use the jargon of no more than ten or so pages in total. The Governor's Readiness Project recommended such a step in 2008, and we think the time has come to revisit this proposal. It would also complement the greater freedoms and flexibilities proposed for all schools in Chapter 2.

In the longer term, if the transformation we envisage in this report is to occur, a new grand bargain is needed. We outline above what the features of such a bargain might be.

> Talented teachers that embrace the idea of constant innovation and who welcome the chance to take on greater levels of responsibility and be rewarded accordingly have much to gain from a new bargain.

We recognize that establishing such a bargain will not be easy. Some teachers will be concerned by any change from the status quo in which they fear their rights will be eroded. We emphasise, however, that there are a great many potential upsides for teachers from such an approach. Talented teachers that embrace the idea of constant innovation and who welcome the chance to take on greater levels of responsibility and be rewarded accordingly have much to gain from a new bargain. The new professionalism we talked of at the start of this chapter offers the chance for teachers to take greater ownership of the development of their professional practice in a way that is common in other professions such as medicine and law. Developing such a profession with deep expertise and commitment to improvement is key to attracting talented teachers in the future.

We would urge leaders among the teaching profession to take an ambitious and farsighted perspective with the goal of creating the best education system in the world; one that delivers outstanding performance and is a rewarding and fulfilling place to work. We believe strongly this would be in the interests not just of students and communities, but also of teachers themselves. Union leaders need to become more than advocates of successful, publicly-funded education. They must commit to providing clear evidence to taxpayers that what they offer to students is so good that it will always be worth investing in. For this to be the case, teachers, districts and the state need to become advocates, in collaboration, of whole-system reform and systemic innovation.

Perhaps the best way to conceive the difference this would make is to imagine a retired teacher in Massachusetts in 2030. She is sitting on a veranda in the Berkshires when

her grandson asks her what she did during her career. She might say, "I was a teacher, I loved the children but the work was tough and my colleagues and I were ground down by the endless reform and bureaucracy. It was such a relief to retire. I hope you will never be a teacher." Or she might say, "I was a teacher. It was incredibly demanding and tough but I can't imagine a more rewarding career. We transformed our profession in the last 20 years. Teachers in our state are now admired across America, even across the world. And the Massachusetts education system is fit for that 'shining city on a hill' you learned about in school recently. One day, if you study very hard, you might be able to be a teacher."

The truth is that many teachers and education reformers know that the current state of affairs is far from ideal and that there is a need to leap beyond the constraints of the present. Why not this group of leaders? And why not now? It is up to the state and its teachers to choose. We believe strongly that if Massachusetts is to be the best education system in the world, a new paradigm of collective bargaining which prioritizes student outcomes and long-term progress will be required.

Selecting and developing more effective leaders and deploying them system-wide

Apart from classroom teaching, nothing influences improvements in school standards more than the quality of school leaders.[22] The importance of leadership is further emphasized by our earlier recommendations that budgets and responsibility should be devolved to the school level. The principal is then like the conductor of an orchestra – his or her role is to bring out the best in the faculty, staff and students. Previous research by Michael Barber and colleagues has looked at the range of practice across different countries in selecting and developing school leaders and in their use across the education system in a variety of different roles.[23] In what follows, we draw heavily on the lessons from this research to set out how Massachusetts can develop its own overall school leadership strategy, which should be a top priority.

The first step is to systematically identify those teachers with the talent and temperament needed for leadership and encourage them to pursue a career path that will prepare them for school leadership. The research found "some systems leave this to chance and rely purely on self-identification, while others provide opportunities to take courses or join programs to build capacity and interest

> High-performing systems are much more deliberate about identifying and selecting future principals.

in leadership. However, the most advanced go further by proactively guiding the careers of potential leaders so that they can gain progressively greater leadership experience through the roles they take on." There are some programs in Massachusetts which take a more active leadership development approach, such as Teach Plus, but on the whole Massachusetts probably sits somewhere between the first and second of these approaches. Although programs such as the National Institute for School Leadership program are available to prospective principals, there is no requirement in Massachusetts that candidates for school leadership positions undertake this or comparable training. Districts are free to appoint whomever they want as principals. For a system that aspires to be the best in the world, this is too haphazard.

By contrast, Barber and colleagues' previous research showed that high-performing systems are much more deliberate about identifying and selecting future principals. "In Ontario, for example, all districts are required to have a succession and development plan. Singapore schools are responsible for identifying potential leaders during their first five years of teaching, and future leaders are put on a development track which will involve them in roles in a variety of schools and the ministry." Massachusetts should ask all districts to identify potential future leaders and newly appointed principals, and ensure they are matched to leadership development coaches who might be successful, experienced principals or members of the business community.

The research also showed evidence from other countries that making the role of principal more attractive is also important. This is not purely a matter of pay, although compensation is not unimportant. Separating the role of instructional leader from the business-related functions of running a school can help make the role more manageable. England created the post of school business manager, answerable to the principal, for this reason, and many Charter schools in the US have done the same. We would recommend schools create this kind of administrative support/business manager role across the clusters or networks of schools we identified in Chapter 3 to enable the principals concerned to focus on improving classroom practice. It

is also vital that leadership is distributed within schools and that leaders in addition to the principal take responsibility for setting standards of professional practice and creating a culture of continuous improvement.

The research also showed evidence from high-performing systems that the system itself should take a more active role in the selection and placement of school leaders. Singapore and Ontario go further than most systems in matching principals to specific schools and using experienced principals on selection panels. While Massachusetts might not choose to do this for all schools, given the resources involved the state should play a much more active role in the appointment of principals to Level 4 schools. It could, for example, put forward two or three names of successful principals who were seeking to broaden their experience, from among whom the district could choose or create a pool of approved candidates from whom schools could choose themselves. If this proved effective, the state could expand this role to other schools. It could also identify a cadre of the most effective potential future or existing principals who could be incentivized to take on the challenge of working in some of the state's toughest schools by being rewarded both financially and through career progression.

The other lesson from this research is that top-performing countries create regular opportunities for school leaders to learn from one another through networks and clusters. Some also increasingly make effective use of their high-performing principals across their systems, creating leadership responsibilities outside their own school, including within the department of education (as Singapore does systematically). This has the double benefit of broadening the perspectives and impact of successful leaders and providing career progression for them.

We have already identified in the previous chapter the need to create stronger networks of schools in Massachusetts. The evidence shows that, in effective cluster models, principals value the support they get from working with other principals and schools. In Singapore, all principals and vice principals in a cluster meet once a month with a specific learning objective. Many of these networks and pairings already exist in Massachusetts; the challenge is to ensure that all principals have deep and meaningful relationships with at least two other principals in a structured way. This needs to be much more than just attending a meeting; it needs to provide for structured and ongoing learning related to the role.

Beyond structured learning opportunities through clusters, Massachusetts should also develop the use of its most effective principals across the system. At the moment, the only route for principals to progress within the system is to join the district administration and become a superintendent or deputy superintendent. This is not an attractive option for all principals, particularly those who relish being close to the classroom. We believe Massachusetts should strengthen its capacity to keep some of its best principals in schools but to widen their administrative reach so they have an impact on more schools and students, especially those in the most challenging schools in high-poverty areas.

We identified earlier in this chapter the benefits of such arrangements in London, where national and local leaders of education – demonstrably successful headteachers (principals) selected on the basis of proven track-record by the National College for School Leadership – were trained to provide support in a systematic way to other schools. This support has worked most effectively where it has come not just from the designated headteacher, but from the entire faculty of the successful school. This enables schools to learn from each other at a level of specificity that makes a difference; for example, planning how to teach a particular aspect of the science curriculum, managing children with special needs, or evaluating teachers' performance.

In England the law has been changed to allow these arrangements to become formal structural partnerships emerging between schools – federations – in which a successful principal becomes an Executive Principal with oversight for a number of schools. There are now numerous examples of executive principals leading six, seven or even more schools and not only improving performance across the group but turning them into engines of leadership development. More recently, these federations have begun to take responsibility for teacher preparation too. In effect, as mentioned in Chapter 3 above, this is allowing for the emergence of Charter chains from within the traditional public system. It is too early to claim that these chains are a proven approach, but the initial signs are very positive. A condition of their success is significant operational freedom for the Executive Principal over budgets, staffing and strategy. This is what makes the role attractive and the impact possible.

Similar models already exist within Massachusetts, but so far only within the Charter sector, where proven providers such as Unlocking Potential, Match and Phoenix have expanded the number of schools under the same overall leadership. We believe these models, including the necessary

operational freedom, could be introduced across the public schools in Massachusetts and, if successful, expanded. This would of course have implications for school governance where such partnerships are formed between schools operating in different districts. The redesign competition for districts, proposed in Chapter 3, should provide an opportunity to test this idea in the circumstances of Massachusetts.

The final part of the story is about preparing leaders for the role of superintendent. Many of the same lessons for principal development apply here too. Massachusetts has already introduced the 'New Superintendents Induction Program' (NISP) on which we heard positive feedback. The Broad Fellowship is another example of what is possible. These kinds of programs should become the norm for both aspiring and current superintendents.

The much bigger challenge for the ongoing development of superintendents will be to design a program which enables them collectively to make the shift to leading the radically different districts we describe in the previous chapter. This will require two distinct phases: first, an awareness-raising phase in which the radically different nature of the role is communicated widely and debated among superintendents and relevant stakeholders; and second, a skill-focused phase in which superintendents and other senior administrators across the state collaborate to learn the new skills involved in the new role. For example, managing a portfolio of Charter or Charter-like schools involves a range of specific skills quite different from those involved in traditional direct administration. The business and higher education communities, in collaboration with the Massachusetts Association of School Superintendents (MASS), could play an important role here in designing and implementing such a leadership development program.

Conclusion

Massachusetts has an opportunity to become the global leader with world class teachers and leaders operating in schools and districts across the state, and with its best teachers and leaders driving the improvement of some of its most challenging schools. System reforms should include strengthening teacher preparation and licensure arrangements as well as identifying and deploying the best teachers and principals where they can have the greatest impact on student learning. At the same time, systemic innovations in new teaching practices through stronger peer collaboration and use of new technologies can help achieve this ambitious goal. We set out our recommendations on the next page.

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RECOMMENDATIONS

By 2016 Massachusetts should:

- Implement and trial new school-led, partnership-based models for teacher preparation.
- Establish a significantly higher bar for professional licensure and tenure.
- Implement a process for identifying and deploying Advanced and Master Teachers.
- Develop new models of in-school and school-to-school professional development.
- Develop and implement a new, statewide teacher union contract.
- Play an active role in the appointment of principals to Level 4 schools, use the most effective principals across the school system and develop new models of school chains.

RECOMMENDATIONS

By 2020 Massachusetts should:

- Establish a more diverse range of school-led teacher preparation providers.
- Fully implement new proposals for professional licensure and teacher tenure.
- Build a portfolio of new approaches to teaching and use of new technologies and share this widely across schools, through peer-to-peer collaboration and school networks.
- Develop a new grand bargain between the state and teacher unions.

CHAPTER 5

UNLEASHING INNOVATION

MASSACHUSETTS SHOULD:

- Invest in a new technology bond to upgrade the technological infrastructure of the school system and the technological capacity of schools.
- Develop and run an annual Massachusetts Accelerated Learning Challenge that rewards proposals designed to combine technology and pedagogy.
- Establish the Innovation Collaborative – a statewide network to bring together educators, education technology innovators and venture capitalists to develop a common dialogue on innovation and to oversee the Massachusetts Accelerated Learning Challenge.

We live in a time of incredible creativity and innovation. Technological progress in connectivity, computing power, data analytics and information accessibility is faster and more dramatic than ever before. The education landscape is bursting with new tools, organizing ideas and technology-enabled solutions, all with the promise to create the paradigm shifts needed to engage students and close the gaps we have identified in this report. In this chapter, we focus on how Massachusetts can become the epicenter of education innovation – a place whose rich history of academia, growing education technology industry and high-quality school system can combine to create entirely new educational opportunities, the tools for continuous improvement. We focus on both technological innovation and the ways in which this can be combined with new approaches to teaching and learning.

The incredible impact of technology on many aspects of our lives can lead to the mistaken assumption that innovation and technology are synonymous. This is not the case. Technology is an enabler, or catalyst, to make the things we already know work better and more efficiently. What makes the current stage in educational history so exciting is neither the educational developments in terms of pedagogy and technique nor the technology, but the potential when both are combined. The opportunities for the next decade are huge.

What are these potential innovations?

One of the best opportunities to change the interaction between teachers and students is in what has come to be called 'blended learning'. It's useful to start here with some definitions of this and other key technologies to be discussed in this chapter, including the 'flipped classroom' and '1 to 1'.

Blended Learning. Michael Horn (a resident of Lexington, Massachusetts) and Heather Staker, from the Clayton Christensen Institute for Disruptive Innovation, provide a robust definition of blended learning:[1]

> *"a formal education program in which a student learns at least in part through online delivery of content and*

instruction with some element of student control over time, place, path and/or pace AND at least in part at a supervised brick-and-mortar location away from home"

The 'flipped classroom' is a type of blended learning model with traditional face-to-face-guided practice (or projects) on campus during the school day and online delivery of content and instruction of the same subject from a different location (often home) after school. The primary delivery mechanism of content and instruction is online.

'1 to 1' simply designates a learning environment with one device per learner.

The best blended learning offers a number of potential advantages to students and teachers:

- It allows for more student centered learning approaches as described in Chapter 2.
- Best-in-class educational resources, with a proven ability to improve outcomes, can be scaled across large groups of learners.
- Teachers can become mentors and activators of learning, as opposed to focusing on the delivery of content to students.
- Teachers have more time for planning and instructional time is better directed at supporting students.
- Assessment systems are automated and provide more regular feedback, therefore allowing teachers to identify student weaknesses and best remedial practices.
- Streamlined operations with costs similar to – or less than – traditional schooling.

Blended learning has huge potential, but evidence is still needed to demonstrate significant improvement in learning outcomes. Several Charter schools have taken the lead in implementing blended learning, see the example of Rocketship Education, a network of Charter schools in southern California serving low income communities below.[2]

While blended learning is a powerful and embedded example of technological innovation, it is not alone. There are many other tools and techniques that can help. Some of these are open and available for free. We outline some of the biggest potential innovations below.

Online modularized content

One of the earliest and most highly touted innovations has been the plethora of free online modules which teach concepts as simple as counting and as complex as multivariable calculus. These videos can be accessed anywhere, anytime from a device connected to the internet. Prominent examples of these include the non-profit Khan Academy,[3] which now boasts a library of around 4,500 videos in various subject areas, and Better Lesson, a site with over a million lesson

CASE STUDY:
Rocketship Education's Blended Learning Approach

Rocketship has a learning lab in which students use computer-based online learning programs in math and reading with a facilitator supervising, but the system retains a heavy emphasis on teacher professional development and engagement with parents. Rocketship is thus able to save resources by reducing the number of teachers needed without negatively impacting student achievement. In fact, in 2010 Rocketship was ranked in the top 15 schools in California serving low-income students (more than 70% of the school population).[4]

plans, classroom materials, and instructional resources designed, made and curated by teachers, which include new common core aligned lessons from master teachers.[5]

These organizations and innovations are good examples of first generation education technology that is making basic content, information and instruction available for anyone to use. These videos help students to review key concepts at home, aid teachers in preparing for lessons the night before, and, in some cases, provide a substitute for teacher delivery of content in a classroom. Online education content in this form is basic, but its openness and increasing quality is powerful. These videos are now being linked with exercises, built-in assessments and educational "games" that increase engagement and motivation for students.

Digital textbooks

Another innovation is the digitization and recreation of the traditional textbook. For the past several decades, school has meant heavy, backbreaking textbooks filled with all the content that was 'covered' during the year. Students would work chapter by chapter through the textbooks to learn all the facts. States or school districts would buy textbooks about every five years, when the new edition would come out with slightly updated facts and assignments, but for the most part the same material. Now, given mobile computing and the growing use of e-readers, there is a much more appealing, innovative solution: e-textbooks that can be updated in real time when synced with the internet; they can also include embedded videos, exercises, demonstrations and interactive graphics.

Social

Education systems are now beginning to take advantage of the relatively new class of innovations offered by social media. From Facebook to Twitter to Tumblr and SnapChat, social media and instant communication is how the younger generations will naturally expect to converse. Young learners increasingly expect school to be like their life outside of the classroom: online, real time and media rich. This interaction among peer groups and professionals is immense, and some startups have already begun to capitalize on this. Edmodo, for example, is a social networking platform dedicated to education. Its main product, offered for free, allows teachers to set up virtual classrooms that can aid student-to-student interaction as well as effective teacher feedback. Edmodo has an online calendar and allows learners to submit assignments online, all while having the look and feel of Facebook, which learners are already using to manage their personal lives.[6]

Mobile

Over the past 10 years, the use of mobile devices has accelerated rapidly. Cell phone penetration in the United States has already reached around 99%, and 74% of Americans have data services or 'smartphone' capability.[7] Already, Apple has sold 10 million iPads for educational purposes, and large school districts such as Houston are beginning to take big bets on the power of these devices. Massachusetts should not simply acquire devices and expect transformative outcomes, but when their use is properly planned and implemented, mobile devices are an undeniably powerful tool to drive learning and engagement. Most young learners will already have a phone and are used to the instant access, immediate feedback and ubiquitous information they provide. Mobile devices can harness existing engagement and extend the learning day to outside formal classroom walls.

Adaptive platforms

The impact of both online content and e-textbooks is amplified by the rise of adaptive platforms or software tools that adjust the learning experience based on a student's prior performance and progress. Companies such as Knewton have developed algorithms and data science engines to provide a platform that allows their partners to create adaptive experiences for any subject or content, allowing for personalization of the learner experience. Knewton is able to help instructors answer questions such as "What concepts does a student know, at exactly what percentile of proficiency?" or "What is the probability that student will pass next week's quiz, and what can she do right this moment to increase this?" [8] Another example is Dreambox Learning[9], which has similar adaptive learning platforms and claims to change in real time with every interaction with a learner, collecting over 50,000 data points in every hour of use. Data can thus provide real time insight on student progress.

Gaming

Learning through simulations and games has always been an effective tool. In the best cases it allows leaners to learn by doing and experiencing. A new wave of education innovations has introduced elements of gaming into products to drive forward engagement and make learning feel more

> Well-designed games can also help students learn crucial behaviors and skills such as patience, tenacity and discipline.

intuitive. Well-designed games can also help students learn crucial behaviors and skills such as patience, tenacity and discipline. Professors at the University of Wisconsin have shown that boys who usually read a few levels below their school grade were able to master texts a grade or two higher if the text was part of an online game, the hypothesis being that if these young boys could choose what they read, they would push themselves harder.[10]

One of the biggest challenges facing teachers is how to manage behavior in the classroom. Gameficiation can help solve that by digitizing systems of rewards and bridging parents, teachers and students. Massachusetts' inventors have produced many game-based products with great promise, including Quandary, a game which builds competencies in ethical thinking (Winner of the 2013 Game of the Year Award at annual Games for Change Festival), developed by the Learning Games Network, a non-profit spin-off of the MIT Education Arcade and the University of Wisconsin-Madison's[11] Games+Learning+Society Program. Another example is Muzzy Lane's 'Making History' game and its successor "Making History II: The War of the World" developed in collaboration with Professor Niall Ferguson.[12]

Developing the basic technological infrastructure to support these innovations

Technology-enabled innovation in education is exciting, but it needs a strong existing technological infrastructure to enable schools and districts to take full advantage. This includes basic elements such as a large, uninterrupted power supply, enough modern devices (desktops, laptops, tablets) for students to use effectively, extremely high internet bandwidth to support full classrooms of mobile devices going online, and a fully integrated set of software. The challenge associated with the effective procurement and implementation of the most basic technological infrastructure cannot be overstated.

To meet this challenge, Massachusetts will need to make a significant investment in upgrading the technological capacity of its schools. Other states are currently considering such an investment – California, for example, has recently proposed a $9 billion bond for K-12 technology.[13] If Massachusetts does not want to fall behind other states, it will need to make similar investments in upgrading the

USING MOBILE technology to unlock student interest

IMAGINE a young learner, Sophia, who is constantly connected to the internet. When she is asked "What happened at the battle of Gettysburg and what is the Gettysburg Address?" her first inclination will be to reach for her iPhone and type the question into Google. Every mobile device is like a mini library. In seconds, Sophia will have an answer, perhaps from Wikipedia, or from civilwar.org. The teacher may verify this information, and Sophia will think "What's next? What should I do with this information?" The teacher responds: "Why was this a pivotal moment in the Civil War? What was President Lincoln trying to accomplish? How is this address still relevant to us today?" This is the moment where the teacher engages Sophia and activates her interest enabling higher-level thinking as she moves beyond what and when to why and how with seamless real time access to high-quality content.

technological capacity of its schools. Doing so will require Massachusetts to make difficult judgments about hardware platforms to create economies of scale in purchasing while avoiding premature obsolescence. It will also need to implement technology that will both give students access to the extraordinary wealth of information on the internet, while protecting them from content that could prove harmful.

These aspects of technology are complicated and are likely to require a dedicated and sophisticated IT support staff to ensure that the basic infrastructure is maintained, kept current and upgraded when necessary. School systems will need advanced help to ensure that data and information security is fully in place and properly implemented, and also that systems and datasets speak to each other. The business community (subject to appropriate safeguards around any conflicts of interest for companies operating in the education technology space) will need to play a major role in supporting and working with the school system to develop and build the strategic and legal capacity needed to lead this technological revolution. We will look in more detail in the next chapter at such partnerships, but a key focus of their efforts should be in this space.

By itself, technology will do very little to change student learning and outcomes. It is the combined use of technology with new approaches to teaching that has the transformative potential. In the rest of this chapter, we will set out some of the early evidence that is emerging about what these new combined approaches look like, and identify how Massachusetts can do more to connect the education and education technology communities to promote these innovations and take them to scale.

How technology changes the relationship between the teacher and the learner

In addition to letting technology permeate, another key component of Massachusetts' innovation agenda should be the exploration of new pedagogies, as we have already identified in earlier chapters. As Michael Fullan explains, "We should do less of spending money on assessment detached from designing learning and more on creating learning experiences that are irresistibly engaging. …Students and teachers [should be]… conjointly stimulated to engage in the pursuit of deeper learning, …fueled by their passions and purposes."[14] We need to rethink the role of the teacher and the engagement of students.

By itself, technology will do very little to change student learning and outcomes. It is the combined use of technology with new approaches to teaching that has the transformative potential.

The chart below shows the percentage of students using different types of technology in schools across seven countries. The more ambitious and transformative uses of technology remain rare. One might expect technology adoption in Massachusetts, given the economy of the state and the level of expenditure on education, to be higher but from the evidence we saw during our consultations, the more transformative approaches are still in the minority. In fact, we heard again and again, both from educators and the education technology community, that interaction was limited and the potential, if the barriers could be overcome, great.

John Hattie, professor of education at the University of Melbourne, has analyzed a wide variety of teaching approaches to identify those that make the most difference to student learning outcomes.[15] His evidence strongly refutes the oft-repeated view that technology will enable the teacher to shift from being 'the sage on the stage' to being 'the guide on the side'. He makes it clear that the evidence supports neither half of this cliché. What really works is what Hattie calls the teacher as 'activator'. This is a teacher who inspires, mentors, coaches, informs, motivates and challenges their students. This is a teacher who enables students to tackle difficult subject matter and helps them overcome the barriers to learning it, and who therefore enables students to experience the true joy (not the fun because, as everyone knows, learning difficult stuff is not always fun) of deep learning. This is a high bar to set for a good teacher, but Hattie has shown it is what it will take to be best in the world. The beauty of this historical moment is that technology combined with good teaching can at last make this a reality for every student.

No one can be quite sure yet what this will look like across an entire system, but Fullan and Langworthy offer the best account so far.[16] They argue, students will be treated as learning partners with their teachers, there

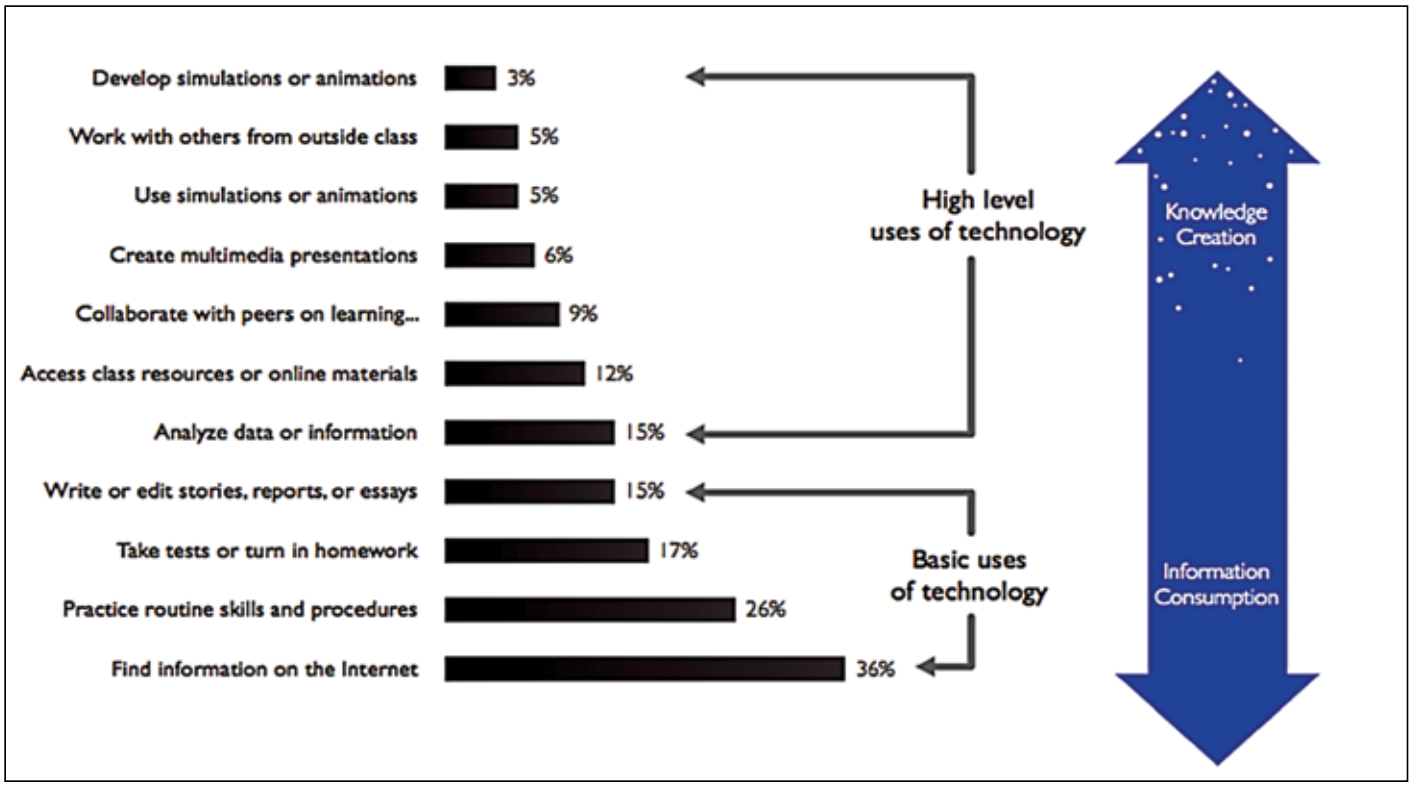
will be more peer-to-peer teaching, much better and more instant feedback on progress, and students will be offered choices as well as mandates. Of course, as we have explained in Chapter 2, what we teach will need to evolve as well. We can be more ambitious – indeed to achieve the aspiration suggested by the MBAE, we will have to be! Schools will need to foster innovation, empathy, leadership and collaboration alongside knowledge and thinking. All pedagogy and content will have to be, in Fullan's words, irresistibly engaging, elegantly efficient, steeped in real-life problem solving and immersed in ubiquitous technology. That, of course, should be the goal. It is easy to write, but much harder to do in practice, for four reasons.

- The question of making decisions about which particular technologies to choose at both school and system levels and ensuring that they work consistently and unobtrusively.
- The challenge of changing teachers' professional practice to make best use of the new opportunities.

> If Massachusetts could foster and accelerate the rate of adoption of high quality innovation now, it could build a system that incorporates continual evolution as part of its very DNA.

- The need to change the way the school as a whole operates and to rethink fundamental drivers of the daily school experience, including the master schedule, the relationship between learning at school and learning at home, the school year and the use of space.
- The challenges of ensuring these new opportunities have an impact on outcomes, at scale, across a whole system.

Adoption of technology across international school systems[17]



For one or more of these reasons, few if any technological innovations have yet resulted in dramatic changes in performance at system level. As Secretary of Education Arne Duncan has said, there are islands of excellence but not systems of excellence.

Young people whose lives out of school have been transformed by, for example, smartphones and the extraordinary connectedness with peers that such devices enable, all too often find that the school experience is not keeping pace. Fullan and Donnelly argue there are two powerful forces at work.[18] "One is a relentless 'push' factor of how boring school has become. As many as 95% of kindergartners are excited about learning in school, but this percentage deteriorates steadily over time and only 37% of 9th graders are similarly enthusiastic. Meanwhile, the proportion of teachers in the US wanting to leave the profession is now nearing one in three."

Too often for both students and teachers the school day has become a dutiful drudge rather than an inspiring challenge. Meanwhile, there is a counterforce or 'pull' of fast, expanding and often breathtaking digital innovations. The gap – and the tension – between the push and the pull is ever-expanding, yet the opportunity is huge if the barriers to transformation could be torn down. The potential of technology here is not to dumb down the curriculum but to enable sophisticated material to be presented in multiple ways with the immediate seamless interactivity that the best computer and online games allow, to entice students into struggling with that material to the point of mastery.

Thus the task for the next decade is for Massachusetts not only to incorporate innovative pedagogies and blended learning approaches rapidly across the state, but also to develop advanced and cutting-edge mechanisms for discerning what are the most effective ways of doing this. If Massachusetts could foster and accelerate the rate of adoption of high quality innovation now, it could build a system that incorporates continual evolution as part of its very DNA. The education systems that figure out how to keep up with this pace, and remain flexible in order to be resilient, will succeed. Those that do not will in time become obsolete. Again, the economic and educational circumstances with which Massachusetts is already blessed should make it well placed to lead America, and the world, into this future.

How can Massachusetts become a global leader in system-wide innovation?

Our argument is that, to seize the opportunity, the state needs first to do more to incentivize and exploit the cutting-edge developments already present in Massachusetts, by establishing a statewide innovation competition. The Next Generation Learning Challenge

CASE STUDY:
Next Generation Learning Challenge sparks innovation

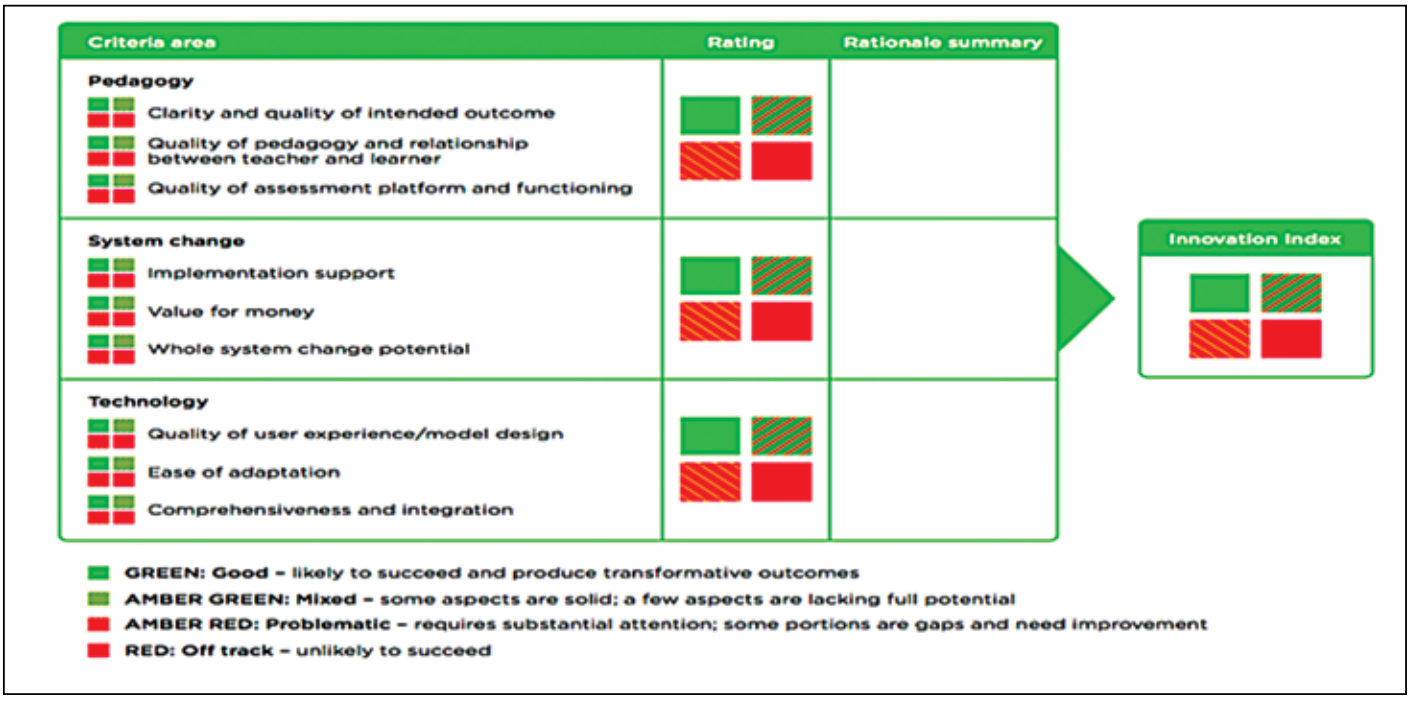
NGLCs are national competitions that "aim to accelerate educational innovation through applied technology in order to dramatically improve college readiness and completion." To date, the NGLC has led several rounds of thematically-focused challenge grants and is now looking for opportunities to launch at state level. NGLCs target specific grants to institutions that are piloting new uses of technology and competency-based models. Each Request for Proposals (RFP) outlines the challenges, states the value and number of grants to be made, and provides direction for proposal development.

provides a model Massachusetts might use to design such a competition.[19]

We suggest that Massachusetts either partner with the NGLC or build a comparable model to host its own Accelerated Learning Challenge during 2014 or 2015. The Challenge could specifically ask for proposals which would draw on successful or promising examples of new pedagogies and 'blended learning', which could help in closing one or more of the Six Gaps identified in this report. Priority might be given to proposals that address the areas of greatest need, for example in developing new opportunities in STEM subjects or in areas where the achievement gap is greatest. Whatever the specific focus, we recommend that the **Massachusetts Accelerated Learning Challenge** should have the following features.

1. **Focus on implementation at scale.** Although each challenge's Request for Proposals (RFP) will seek a variety of innovative ways of teaching and learning, Massachusetts has the opportunity to brand itself as the US birthplace of the most cutting-edge and foresighted blended learning models. Perhaps the west coast has led the way in the education-technology space, but the east coast – and specifically Massachusetts – could become where technologists and educators work in partnership to crack the code on implementation at scale in order to produce results. This would not mean rejecting ideas that have yet to prove themselves at scale; it would mean generating continuous dialogue about implementation at scale between education leaders and innovators, and building proof of scalability into the competition. Proposals that have the potential to impact at a system level would therefore be given greatest priority.
2. **Design the likelihood of success into the process.** We recommend that the Massachusetts Accelerated Learning Challenge adopts the Innovation Index as the cornerstone of its proposal review process. The Innovation Index[20] is a new method of evaluating educational innovations based on research and experience. It was very well received during our consultations and has been piloted successfully with innovators and school district leaders elsewhere in the US. Its basic insight is that technological innovation in education will only work if those adopting it think simultaneously about the technology, its pedagogical implications

The Innovation Index



and system change. The Index (shown here) takes this basic idea and makes it practical and usable, giving clear guidance on how to judge new approaches.

3. **Ensure innovations are school-driven.** The central thrust of our report is that, as the system advances, schools and school leaders need increasingly to be in the driving seat. This has been emphasized in earlier proposals and should apply equally to this competition. It is important that principals and educators lead this transformation, since their ambition is the key to the future and they understand the day-to-day realities of implementation. We suggest that every proposal submitted to the Massachusetts Accelerated Learning Challenge would have to show it has already engaged a network of schools in its development.

4. **Engage students and parents in the design.** The Massachusetts Accelerated Learning Challenge should also draw on what parents, students and citizens would like to see in the way of innovation. For example, Mayor Park Won Soon of Seoul in South Korea has successfully used a crowdsourcing technique in his city to develop new ideas for public services. He invited citizens to voice their ideas and suggestions through 'listening workshops'. Among the projects that have come from citizens' suggestions are late-night buses that serve 2,000 passengers per day, safe zones for children, and parking spaces near small eateries to increase their sales.[21] The MBAE, the DESE and other partners could create an online version of these 'listening workshops', as well as face-to-face interactions which allow students, parents and teachers to test the ideas emerging from Accelerated Learning Challenge applicants.

5. **Use collaboration as well as competition to enhance impact.** On the basis of competitions we have designed previously, there is huge potential in running collaborative workshops for proposals at an early stage of their development. Once there are, for example, seven or eight teams left in the competition, each should receive some seed funding and they should be involved together in three or four substantial workshops on aspects of delivering success at scale; they should hear from experts in these workshops but also learn from each other and make connections.

6. **Use peer review to decide the winners and ensure transparency.** Finally, the shortlisted candidates should, at the end of a six month period involving the workshops described above, present their proposal at a demo day to a panel of education, business and other leaders. After this, the shortlisted teams themselves should vote, on the basis of pre-agreed criteria, and identify the top two proposals. These would win substantial investment with which to implement and refine their proposal. This process would ensure that all the shortlisted candidates benefitted, and even those who did not 'win' had the opportunity to put themselves on the agenda and perhaps attract partners or other investment. Venture capitalists and other private investors could be invited to the final presentations for this purpose. All proposals should be made public, and interviews of shortlisted candidates videoed and made publicly available. Winners might also be asked to commit to involving students themselves in the further development of their ideas – providing further opportunities to stretch those with an aptitude and interest in technological innovation.

An annual Massachusetts Accelerated Learning Challenge would speed up the growth of the Massachusetts education innovation space, incentivize development activity in the academic areas that present the greatest challenges, and excite educators and citizens about the potential for transformation. We emphasize how important it is to lift all the stakeholders in the state above their current, often very familiar, debates so that new horizons come into view.

However, to create lasting, widespread adoption of new methods, it is important to build the capacity and capability for schools to develop new ideas, and to connect the education and education technology communities. Schools need to be encouraged and supported to think about doing things differently. They also need to be exposed to and offered the opportunity to work with innovators who can help them think about the possibilities that technology offers. The existing support available to districts and schools is unlikely to be able to do this. We think Massachusetts needs to create new capacity to support schools in innovating. An example to look at would be New York City's iZone[22] described below.

Another example of the type of approach Massachusetts should consider comes from Israel. About two decades ago, the country faced a similar

CASE STUDY:
iZone invests in public sector innovation

"In 2010, the New York City Department of Education launched the Innovation Zone (iZone), a dedicated Office of Innovation to support schools in personalizing learning to accelerate college and career-readiness among students. The iZone now includes nearly 300 schools from across the city and promotes an innovation ecosystem on three levels:

- Supporting innovation in schools
- Driving the market
- Fostering systemic innovation

At the school level, initiatives support personalized learning methods, such as blended learning. At the market level, iZone launches challenges for the edtech sector. At the system level, it advocates for policy reforms that would greater enable innovation to permeate NYC schools. The program aims to empower teachers, administrators, students and parents with cutting-edge resources and strategies for personalization, while allowing for flexibility to tailor programs to best meet individual student needs."

http://schools.nyc.gov/community/innovation/izone/About_Us/default.htm

challenge to upgrade its educational system, and designed strategies for igniting school-based innovation and integration of technology into schooling. All the evidence suggests that Israel is one of the most successful countries in the world in driving innovation in its economy.[23] Its Center for Educational Technology is designed to connect this innovative capacity to its education system (see the case study on the next page.)

We believe Massachusetts needs an organization to play this kind of role in the state, to create a forum for sustained dialogue among educators, innovators and investors about new pedagogies and blended learning approaches. We have heard repeatedly in our consultations that, in spite of its undoubted capacity in these areas, such dialogue is missing and the education system's innovative capacity falls short of its leaders' aspirations. The Commonwealth should create an Innovation Collaborative to create such a forum to bring together educators, the startup and innovation community, and providers of venture capital.

No new large public bureaucracy is needed for this task. A properly supported network with a small, talented staff from the relevant fields could play the role and connect the relevant players and create the circumstances in which dialogue occurs and ideas are sparked. Such a collaborative would not need to be expensive, and funding could come from a variety of philanthropic, business and perhaps public sources. It will likely repay itself many times over, by contributing to that combination of system reform with systemic innovation on which future progress critically depends. No system in the world we know of has yet pulled this combination together, making this an opportunity for Massachusetts to lead the world, as it aspires to do.

There are risks in creating a new organization at a state level that does not have the established connections to districts and schools across the state. The Innovation Collaborative should therefore have a number of satellite locations around the state, in districts and high school buildings, so that teachers and students can interact and even collaborate with entrepreneurs. These satellite locations can be viewed as a 21st century 'public library' – a popular café and work space – so that they become sources of information on education innovation while also serving as a place to meet. The Innovation Collaborative could also link into the District and School Assistance Centers.

The Collaborative's main responsibility would be to manage the Massachusetts Accelerated Learning Challenge. Simultaneously, it would stay in close dialogue with the business community and world of innovation outside education to identify promising trends and ideas. It would, of course, always liaise with the DESE to make sure emerging innovations were either consistent with or informed by state priorities, so that they had a greater chance of a viable future, if they proved successful at scale.

Beyond running competitions, the Innovation Collaborative and its satellite locations should also offer services designed to assist innovators, including, for example, an innovation evaluation service based on the Innovation Index criteria. The review process could provide a startup team with a ranking according to the Innovation Index which would either indicate areas of improvement needed or serve as a badge of approval that could be used in seeking further investment and new partners.

For innovations which successfully provide proof of concept, three options would be available: further investment from venture capital leading to growing and successful business; acquisition by another business which saw the potential; or adoption by the public sector, perhaps through state or district funding of an extended pilot or major rollout.

CASE STUDY: Israel's Center for Educational Technology scales innovation

The Center for Educational Technology (CET) seeds innovative ideas and implements widescale education technology solutions. It has successfully promoted best practice blended learning examples such as virtual tutoring, a fully virtual high school for periphery areas of the country, and a national pilot of 'flipped classroom' teaching. Part of the strategy is to place educators and principals at the center of their work. CET was established and has been maintained through public, private and philanthropic efforts united behind the goal of widescale adoption of blended learning. In addition to connecting innovators and educators, CET attracts philanthropic money to pilot an innovation and prove its effectiveness, during which time it engages with the Education Ministry on product development to ensure that efforts are aligned to system needs. Then, the CET uses the 'proof of concept' to convince the Ministry to invest public funds to bring the idea to scale.

Finally, the Innovation Collaborative would also serve as a signal to the education technology entrepreneurial community that Massachusetts prioritizes innovation in education. This would encourage them to stay and grow their companies within the Commonwealth. Building on the work of LearnLaunch, as well as the Game Design and Teacher Education Program at MIT, there could, for example, be an education technology-themed workspace or hub within the Innovation Collaborative to startup entrepreneurs planning to grow their business within Massachusetts.

Developing innovative capacity in education is urgent for every state in the Union, but nowhere more so than Massachusetts which is leading the world into the 21st century economy – a visit to the MIT Media Lab, for example, makes this abundantly clear – but the state has yet to integrate this awesome innovative capacity into fueling its education strategy.

The Innovation Collaborative and its satellite locations could help Massachusetts meet this challenge. It would act to highlight existing successful models, discover new ones through Challenges, drive the market by helping teachers and parents better communicate needs and aspirations, cultivate new models through co-working opportunities and the piloting and sustaining of high-impact efforts, and foster an ecosystem of innovation. Perhaps most importantly, the Innovation Collaborative would serve as the meeting point for those interested in education technology.

Conclusion

By 2020, when educators and entrepreneurs alike think of Massachusetts, they should instantaneously recognize the state as a mover and shaker in education innovation. Massachusetts should have become a unique place where a rich history of academic achievement and an emerging industry of entrepreneurs have converged, allowing ideas and technology to meet and create real educational opportunities that work. Other state and city leaders will seek the Commonwealth's counsel in determining the long-term viability of blended learning options and new pedagogies for their educational systems. We outline the primary recommendations from this chapter on the next page.

Endnotes

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22 http://schools.nyc.gov/community/innovation/izone/About_Us/default.htm

23 Education, Innovation and Israel, http://www.pearson.com/content/dam/pearson-corporate/files/michael-barber/Education_Innovation_and_Israel.pdf

RECOMMENDATIONS

By 2016 Massachusetts should:

- Invest in a new technology bond to dramatically upgrade the technological infrastructure of schools and to support schools to develop the capacity and capability to take advantage of these new opportunities. The business community will have a major role to play here.
- Run the first Massachusetts Accelerated Learning Challenge.
- Establish the Innovation Collaborative and establish satellite locations under the Innovation Collaborative 'umbrella' throughout the state.

RECOMMENDATIONS

By 2020 Massachusetts should:

- Sustain the Massachusetts Accelerated Learning Challenge as an annual and highly publicized initiative.
- Fully establish the Innovation Collaborative as a recognizable and sought-after brand and identity within the state and nation.

CHAPTER 6

CLOSING THE OPPORTUNITY GAP

MASSACHUSETTS SHOULD:

- Phase in the introduction, over the next five years, of universal, high quality pre-K education, with the first phase focusing on children from low-income and disadvantaged backgrounds.
- Strengthen the evidence base about which teaching practices at school level are the most effective at closing the achievement and opportunity gaps.
- Increase transparency over how funding for low-income students is used by introducing Personal Opportunity Plans for all students who fall behind academically and/or who lack access to wider out-of-school learning opportunities.
- Increase the funding available to schools in low-income areas for extended learning time, and support the development of a market for high quality after school provision.
- Promote the lessons from the Wraparound Zone Initiative about effective school-community partnerships and develop stronger school partnerships with business and higher education.

In this chapter, we discuss how Massachusetts can close the Achievement and Opportunity Gaps identified in the introduction to this report. Schools can do much on their own to close these gaps. Indeed, many schools in Massachusetts have already demonstrated what it takes. We need to learn from them, and from the international evidence, about what works in closing gaps and share this effective practice across all schools. The proposals in Chapter 4 for stronger school-school partnerships and for assigning the best teachers to support schools in the most challenging circumstances are a key part of ensuring this happens. However, achievement gaps are also caused by a wider set of opportunity gaps that exist from birth. These not only persist, but often grow wider through the school system, where students from disadvantaged backgrounds and low-income families have less access to wider opportunities outside school that many families take for granted.

The Achievement Gap starts very early in a child's life. Recently published research by Stanford psychologists[1] reveals that two year old children of lower income families may already be six months behind in language development. If children do not achieve a basic level of vocabulary, linguistic fluency and literacy as well as various social skills before they start school, their ability to unlock the potential that formal schooling offers is massively reduced. It is, therefore, vitally important that all children start school with the foundations in place and ready to learn. Over the next decade this will surely demand universal pre-K, with state funding for all three and four year olds from low-income families. In designing and implementing such pre-K programs, Massachusetts should take into account the growing evidence about what kind of pre-K education makes the most difference.

At a school level, the best teachers and schools can make a significant difference to the life chances of students from all backgrounds. Many schools in Massachusetts are already doing much to close the Achievement and Opportunity

> Narrowing the opportunity gap also has to involve strengthening access to learning outside the school day.

Gaps. Massachusetts should identify in a highly disciplined manner what practices in those schools are both effective and scalable and encourage other schools to adopt these. This will require disciplined action research and real time evaluation to learn more about what is working, and should be one of the priority areas of focus for the new Innovation Collaborative. Moreover, as discussed in Chapter 4, Massachusetts needs to increase the access of low-income and minority students to the best teaching, by incentivizing the state's best teachers and leaders to spend time working in the most challenging schools.

The funding system is another important lever to close the Achievement and Opportunity Gaps. The Chapter 70 Funding formula is already designed to provide additional resources to support students from low-income backgrounds and to enable their schools to put further support in place. However, not all districts are distributing this funding on a weighted basis to the schools that need it most – a subject we will return to in the next chapter. There must be greater transparency at a school level about the way this funding is being spent on individual pupils to help close the achievement gaps. Massachusetts should therefore adopt the proposals made by the National Opportunity to Learn Campaign that every student who is currently a grade level or more behind in reading (we would also extend it to math) be given a Personal Opportunity Plan. This plan would set out how resources will be spent to enable that young person to catch up.

> Massachusetts should aspire to lead this national and international trend towards expanding access to pre-K education.

However much schools do to address the achievement and opportunity gaps, unequal distribution of social capital will remain a reality outside school. Narrowing the opportunity gap also has to involve strengthening access to learning outside the school day – at home in the evening, in communities and in vacations. Students from low-income backgrounds are much less likely to access out-of-school educational support, such as additional tutoring or cultural and sporting opportunities. A recent study in the UK illustrated the extent of this gap by showing that parents in professions are twice as likely as the lowest income parents to pay for weekly music, drama or sports lessons and activities outside school.[2] In Massachusetts low-income students have less access than higher-income students to advanced placement courses and science subjects, while their participation rate in sports is also lower.[3] We are therefore recommending increasing the funding for schools in low-income communities to extend the school day, and believe that part of the Personal Opportunity Plan should include activities the school intends to fund outside of the school day, thereby growing the market for high quality out-of-school provision.

Closing the opportunity gap will also involve partners from outside the school system – from the wider community, businesses and higher education. The Wraparound Zone Initiative, which Massachusetts has implemented as part of its Race to the Top proposal, has piloted new models of school-community partnerships. The challenge is to develop more of these partnerships and share the lessons from them about what works in closing the achievement gap as well as enriching the student's learning experience. Schools are best placed to be the driving force behind these partnerships, potentially building them around the school networks described in Chapter 3.

Developing high quality Early Childhood Education programs

Although the focus of our report has primarily been on K-12 education, many interviewees have spoken to us about the need for a greater focus on Early Childhood Education in the next phase of Massachusetts' education journey. The case for greater investment and reform in early education is supported by a range of academic studies and data.[4] This evidence suggests that large scale preschool programs can make a vital difference to children's early learning, but only if they provide excellent quality and strong levels of instructional support that focus on specific aspects of children's learning such as language and literacy, math or socio-emotional development. The evidence also suggests that while preschool programs can benefit all children, the benefits are greatest for low-income students, particularly in the long term.

OECD evidence also shows that early education can "help to improve children's cognitive abilities and social-emotional development, create a foundation for lifelong learning, make children's learning outcomes more equitable, reduce poverty and improve social mobility from generation to

generation."[5] However, as the OECD also argues, the degree to which it can produce these benefits depends on the quality of the early education services:

> *"Increasing access to services without giving due attention to quality will not result in good child outcomes or long-term productivity benefits for society."*

The OECD has identified five key levers to encourage high quality early education.

1. Setting out quality goals and regulations.
2. Designing and implementing curriculum and standards.
3. Improving qualifications, training and working conditions.
4. Engaging families and communities.
5. Advancing data collection, research and monitoring.

This list has much in common with the reforms that have worked at a K-12 level. Our own experience of early education reform in England in the past fifteen years – during which the country became one of the world's leaders – supports the focus on these levers, and in particular a focus on improving the quality of instruction and access simultaneously, with a program of professionalization of the workforce. Just as teachers need to be better prepared for their role, early educators should be as well.

The state should set minimum levels of qualifications for early educators, particularly in relation to their language and math skills. Our own experience suggests that even if Massachusetts opts for universal pre-K, there will be a need to ensure that the low-income groups who will benefit most are appropriately targeted and take advantage of the expanded access and opportunities. There was insufficient focus on this in the first implementation phase of early education reform in England.

As OECD shows, other countries have pursued programs of early education reform in recent years and Massachusetts should learn from them. Japan, for example, has focused on improving the quality of the early year's workforce, especially for the youngest children, and professional development of staff is mandatory. Finland has also invested in the professionalism of its pre-K workforce. In New Zealand, Norway, Sweden and Korea, improving quality through developing an early education curriculum has been a priority, as it can ensure an even level of quality across different providers and help the workforce clarify their pedagogical aims. It also enables parents to learn about child development and encourages them to ensure a good home learning environment.

There is also a growing trend in the US to expand pre-K education. President Obama called for the expansion of early childhood education programs in the 2013 State of the Union Address.[6] Many States are already moving ahead. In January 2014, for example, Alabama's Governor, Robert Bentley, committed to additional funding for pre-K on the basis of evidence that students in the state who had experienced pre-K programs outperformed their peers once they were in elementary school.[7]

Massachusetts should aspire to lead this national and international trend towards expanding access to pre-K education. To become a global leader, it must commit to phasing in high quality universal pre-K education over the next five years, with the first phase of the plan focusing on children from low-income backgrounds and disadvantaged minorities. A critical part of the plan should be a clear strategy for increasing and demonstrating quality so that legislators and voters can clearly see what they will be getting for their additional investment.

Developing a stronger evidence base about what works in closing achievement gaps

Many schools in Massachusetts are already doing an excellent job in closing the achievement gap for students (see the box below for just one example.) The international evidence shows that a trade-off between equity and excellence is not inevitable – the best systems in the world achieve both.[8] Singapore, for example, has achieved its impressive overall results while at the same time narrowing the gaps between different ethnic groups (Chinese and Malay being the top and bottom performers respectively) from 20% to 5%. By far the most important contributors to this success in Singapore and elsewhere are high expectations, good school leadership and good teaching. There is no magic bullet.

The more difficult task is in determining the most effective practices and spending time and effort on those, as opposed to strategies that have a lesser impact. Thanks to the work of John Hattie[9] and others, there is now a strong evidence base on the impact of different strategies in raising student achievement. He argues that the most effective teaching and learning occurs when it is highly visible to both teachers and students. By this he means teaching and learning where:

CASE STUDY:
Orchard Gardens Public School

Orchard Gardens Public School (OGPS) was designated as a Turnaround school in 2010. Results until 2010 were disappointing, with only one in five students achieving proficiency in MCAS. Following the appointment of a new principal, significant changes in staffing and the implementation of additional Turnaround flexibilities, including a longer school day, OGPS has achieved significant improvement. Student performance on the 2011 MCAS jumped 10% in English language arts and 16% in math, compared to the 2010 school year. As the National Center on Time and Learning noted, "the 2012 school year brought a new challenge to Orchard Gardens – an influx of approximately 120 English language learners from a nearby school that had been closed due to low performance. Still, in 2012, OGPS continued its upward trajectory in student achievement, surpassing 2011 school-wide MCAS proficiency rates by 6% in ELA and 4% in math. Altogether, the school's achievement gains have outpaced the vast majority of schools in Massachusetts. Between 2010 and 2012, the school's combined growth in both ELA and math ranks in the top 2% of schools statewide."

Source: http://www.timeandlearning.org/?=orchardgardens

> "*…the teacher and student both ascertain whether and to what degree the challenging learning goal is attained, when there is deliberate practice aimed at the mastery of the goal, when there is feedback given and sought.*"

Massachusetts should develop its own evidence base on what the most effective interventions for low-income students in the state have proved to be. The key is to use data at the school level, daily and weekly, to identify practices that work in granular detail. We strongly recommend that a focus on innovative, teacher-driven interventions for closing achievement gaps should be one of the top priorities for the Next Generation Learning competition and the work of the Innovation Collaborative. In this way, Massachusetts would develop its own evidence base so that schools in the state would be able to learn from and work together to test and refine innovative practices which close the Achievement Gap. These practices should build on the existing knowledge base which others around the world have already done a great deal to summarize. One example of this is provided by the Education Endowment Foundation (EEF) in England.

It is worth noting how the approach described conforms to the principle of unleashing greatness rather than mandating adequacy. It may be appropriate to mandate or require certain practices, particularly for the lowest achieving schools showing no signs of improvement, but for others they will need to generate these refined practices themselves, and learn from other schools about how best to apply them to their own circumstances.

> A trade-off between equity and excellence is not inevitable – the best systems in the world achieve both.

Ensuring that additional resources for low income students are used effectively

The state's funding formula is intended to ensure that communities with a high proportion of low-income students receive a greater proportion of the state's resources. In the next chapter we will look at how effective this formula has been, and what more might need to be done to ensure that schools with low-income students receive the funding intended for them. In this chapter, we consider how well schools are using these additional resources, and whether greater transparency would help to focus schools on the most effective interventions.

CASE STUDY: The Education Endowment Foundation

The Education Endowment Foundation (EEF) was established as an independent not-for-profit, with the support of private sector endowment and a founding grant from government, to focus on breaking the link between family income and educational achievement. The Foundation's purpose is to identify promising educational innovations that address the needs of students from low-income households and to evaluate these innovations so it can share the lessons with schools. One of the most powerful resources the EEF has developed so far is a Teaching and Learning Toolkit which provides an accessible summary for teachers of educational research into practices which demonstrably improve the attainment of low-income students. The toolkit presents information on the potential impact of different interventions in terms of the additional amount of student progress that can be expected if the intervention is implemented well, the likely cost, and the strength of the research evidence base behind these conclusions. (See www.educationendowmentfoundation.org.uk/toolkit/ for more details.)

The toolkit has been used by schools to evaluate the impact of the additional funding which they receive from government for low-income students, referred to in England as the Pupil Premium. The toolkit has challenged prior assumptions about the most effective practice, showing that the top three interventions are improving feedback to students, developing students' own learning strategies, and peer-to-peer tutoring. These have been shown to have substantially more impact than others such as reducing class size or increasing the number of adults in the classroom. The second phase of the work of the EEF in England has been to fund groups of schools to collaborate in testing the impact of these new innovations in teaching and learning. By comparing results against a 'control' sample of similar schools, the research aims to provide an increasingly robust evidence base.

The National Opportunity to Learn Campaign has set out a proposal that every student who is currently a grade level or more behind in reading should be given a **Personal Opportunity Plan**.[10] This Plan would set out how resources will be spent to enable that young person to catch up. We think the concept of Personal Opportunity Plan is a good one. It would provide a means for the school to account for the way it proposes to use additional funding for low-income students. In this way the anxiety repeatedly expressed to us that the funding for low-income students does not always reach the intended beneficiaries could be addressed. Schools could be asked to produce a summary of their plans and use of the funding and publish this information on their websites to ensure greater transparency and replication of the most effective use of these funds.

The Personal Opportunity Plan could also be used to tackle the out-of-hours opportunity gaps that exist for many low-income students. Even if every school were perfectly effective, opportunity and achievement gaps would still arise thanks to the huge differences in students' experiences when they are not in school, which is the majority of their time. Some parents can provide their children with a wide and rich variety of out-of-school learning opportunities such as theatre and museum visits, as well as after school tutoring in academic subjects. For other parents this is not possible. Personal Opportunity Plans for low-income students should also address how to give such students greater access to these out-of-hours opportunities, which might include private tutoring, museum or theatre visits, sports coaching, music lessons, or any other educational activity from which the young person might benefit. Schools could decide to use their funds to support both group activities or for individual enrichment activities aimed at developing particular talents or interests.

We think there would be value in engaging parents in the discussion about the plan, to give them some say in how

CASE STUDY: City Connects

City Connects is a student support intervention program that addresses the out-of-school factors that can limit the academic achievement and thriving of children living in poverty. "In 2012-13, across all City Connects sites, 15,100 students were linked to more than 57,300 services and enrichment opportunities, ranging from tutoring to athletic programs. City Connects collaborates with teachers and school staff to identify the strengths and needs of every child and creates a tailored set of interventions and enrichment services located in the school and community. By addressing the in and out-of-school factors that impact children, they help students succeed in school." This is demonstrated by evidence that shows that the students in elementary schools City Connects work with outperform their peers on measures of academic achievement and behaviors, work habits and effort. The effect is especially powerful for English language learners. Moreover, the impact is sustained – middle school students who attended City Connects' schools in their elementary years outperform peers from comparison schools on the statewide standardized tests. They are also significantly less likely to be chronically absent in middle school and high school or to drop out of school. And students from City Connect were significantly more likely to achieve Advanced or Proficient in MCAS than comparison students. Source: http://www.bc.edu/schools/lsoe/cityconnects/

this element of the additional budget available for their child should be used. It would ensure a continuing dialogue between the parent and the school about that young person's educational progress. And as they got older, the students themselves would clearly become active participants in this conversation.

In this way, we would also hope, over time, to create a stronger market of providers for out-of-hours opportunities for low-income students. Massachusetts already has a number of organizations working with schools to provide support in and out of school (see the City Connects example on the previous page)[11], but we want to do more to stimulate this range of support across the state.

Extended Learning Time for Low-Income Schools

The other major part of the answer to the challenge of out-of-hours inequalities of opportunity is offered by the work of the Expanded Learning Time initiative, which is helping schools to increase the time available to students and which can help to broaden enrichment opportunities. The evidence from the 19 Massachusetts schools which have expanded their time shows they have been able to extend learning blocks to allow teachers to teach more hands-on, interactive projects as well as to increase the range of enrichment opportunities available.[12] Evidence from a longitudinal study of these schools was more mixed about the impact on student achievement, and suggested there were significant differences in the models of implementation of extended learning time in these schools.[13] However, it also showed that, when implemented well, the use of extended learning time can offer significant benefits to low-income students and their teachers.

Massachusetts should expand the number of schools and districts taking advantage of the opportunities provided by an extended school day and school year. This should be one of the criteria for proposals for the district redesign competition set out in Chapter 2. Proposals would need to explain how districts and schools would free up resources to fund such an extension. The National Center on Time and Learning and the Wallace Foundation have published a report setting out some of the issues for districts and schools to consider.[14]

- Districts and Schools can fund Extended Learning Time using different sources – Federal School Improvement Grants, additional state and district support, use of funds from the school's budget, or philanthropic support.
- Increasing time is cost-efficient: the percent increase in time is greater than the percent increase in costs. However, none of the schools profiled have yet managed to achieve a cost-neutral approach.
- Staffing represents the largest share of the costs, although again the increase in teacher salaries is proportionally not as great as the additional hours of time secured.

Developing further models of extended learning time should be a priority for Massachusetts. As well as looking for district-wide models through the district reform competition, this could also be a focus of the first Accelerated Learning Challenge. In particular, we might look for proposals which combine the use of extended learning time with the use of technology (which may also have lower costs). Our proposals in Chapter 2 to extend access to Advanced Placement courses and promote greater opportunities for academically gifted students through new out-of-school online courses and support are an example of how this approach could play an important part in extending opportunities to talented low-income students.

Massachusetts should expand the number of schools and districts taking advantage of the opportunities provided by an extended school day and school year.

Strengthening School-Parent and School-Community Partnerships

Massachusetts already has many examples of schools and neighborhoods working well together across the Commonwealth. In addition, there are innovative examples of practice throughout the US, including the Harlem Children's Zone in New York, the Strive Partnership in Cincinnati and the case study from Florida below.[15] Spreading the lessons from these partnerships and encouraging more schools to take advantage of these opportunities is the next task for Massachusetts.

There are important lessons to highlight from Miami Dade's Parent Academy approach:

1. **Partnership with the business community.** Although the district mandated that principals promote and support The Parent Academy (TPA) in their schools, TPA also partnered with the business community and garnered the early support of an influential advocate who spoke to the school board on behalf of TPA and opened doors within the business community.
2. **Go to the community rather than ask the community to come to you.** TPA made the strategic decision not to ask parents to come into school to participate in the Academy, but rather went directly where parents lived, worked and congregated. Some Academy sessions were even held in barbershops.
3. **Bring in private investment and rely on community volunteers.** From its inception, TPA was at risk of being seen to take money away from student learning in classrooms. Thus, rather than apply for public funding, TPA's leadership sought external funding. TPA called on members of the Miami business community to step up, and the Knight Foundation became its primary funder.
4. **Crowdsource the design.** To determine the best way to implement the mission of TPA, its leadership assembled a Parent Academy Planning Committee. The committee had six subcommittees, each chaired by a parent and dedicated to designing one aspect of TPA. The committee coordinated a survey of roughly 75 communities throughout the district to determine what kinds of training parents wanted.

Massachusetts has piloted the Wraparound Zones (WAZ) Initiative in 21 schools across five districts since 2011-12 (two more districts were added in 2012-13.) The WAZ is a Race to the Top Project to build district and school capacity to systematically address students' non-academic needs.[16] Participation in WAZ has been voluntary for schools and requires a commitment from their Race to the Top funds. The American Institute for Research (AIR) is currently evaluating the WAZ Initiative and will publish its final report next year, providing a comprehensive analysis of data and results. Evidence from early evaluations and feedback from participants suggests there is significant promise in tackling some of the greatest challenges faced by these schools and districts.[17]

Massachusetts should use the evidence from the Wraparound Zone initiative to promote its lessons to other

CASE STUDY: The Miami Dade Parent Academy

The Miami-Dade County Public School District (MDCPS) is the fourth largest school district in the United States, and over 60% of students receive free or reduced-price lunches. The Parent Academy (TPA) is a district-wide initiative that supports community and family involvement by providing a wide range of free resources in an effort to assist parents in becoming full partners in their children's education and raise student attainment. Examples of the resources offered to parents include courses to help parents help their children succeed in school, to increase their personal capacity and to achieve professional qualifications and certification. The program also runs Family Learning Events to engage entire families in activities which may otherwise be inaccessible to families due to financial barriers. Its Success Academy also offers intensive Saturday tutorial programs to students.

schools and communities. There is huge variation in the nature of schools and the communities they serve across the Commonwealth. For this reason, there is no point in Massachusetts looking to create a single model of school-community partnership. Instead, it should encourage schools or groups of schools to create their own community engagement models. Schools are best placed to judge what they need from these partnerships and to work out – in partnership with other schools, perhaps through the clusters and networks we identified in Chapter 3 – what the best means of delivering and funding these partnerships should be. An example of a Massachusetts school which has formed partnerships with the health sector to develop an extended model is shown below.[18]

Strengthening School-Employer Links

As well as strengthening links with the wider community, Massachusetts also needs to do more to promote effective school-employer partnerships. Such partnerships exist where there is deep engagement between schools and employers – not where employers simply visit or sponsor individual students or schools, valuable though that may be.

While there are some examples of these deep partnerships across the state, particularly in relation to the vocational-technical schools, as the case studies below and on the next page show,[19] from our interviews we have heard loud and clear that Massachusetts is not currently maximizing the full resources among its employers to give young people – and especially those from low-income backgrounds – exposure to opportunities that help them see the relevance of success in education.

The Task Force on Integrating College and Career Readiness has already made a number of proposals in their recent report[20] for strengthening high school students' experience of, and exposure to, the world of work in order to increase their career readiness. It recommended the strengthening of school, employer, higher education and community partnerships. Other recommendations included the creation of a menu and toolkit of opportunities for employers and education, and a statewide database of opportunities available to employers. We have seen a positive impact from something similar in England, where an Education and Employers Taskforce[21] was established to take on exactly this role.

The DESE's Integrating College and Career Readiness Demonstration Initiative, in which districts have been

CASE STUDY:
Blackstone Valley Regional Vocational Technical School

Blackstone Valley School has achieved significant success with scores of 98% and 95% proficiency in English language arts and math respectively in 2013. Superintendent-Director Dr. Michael F. Fitzpatrick identifies a number of factors behind the success. The school has operated a longer school year since 1997 – a 193-day calendar compared to the minimum of 180. Since 2006, the school has operated the Massachusetts Model for Comprehensive School Counseling Programs, which has enabled the schools counselor to take on a more active and career-focused role. The school has developed new curricula for enrichment programs focusing on workplace readiness, allowing students to develop and demonstrate personal, social, technical and employability skills for career and life management. A student wellness initiative has also proven invaluable in partnership with a local hospital, allowing the school-based health center to offer preventative health care, primary care, mental health, nutrition, fitness testing and evaluation and health education.

CASE STUDY:
Worcester Technical High School and Entrustment

Worcester Technical High School (WTHS) provides a model for structuring support from employers for education. It has pioneered use of 'entrustment' agreements to ensure students have access to leading-edge technology. Entrustments are mutually beneficial agreements between the school and private business sponsors documented in a legally binding contract. Sponsors provide the school with new equipment, tools and supplies through conditional or limited gifts, referred to as entrustments, and commit to updating the technology as it becomes available. In exchange, the school allows the use of its facilities, equipment and technology by the sponsor to train local employees, at times convenient to the school.

invited to bid for additional funding, is implementing these recommendations. The first projects will start in the fiscal year of 2014-15. Learning the lessons from these demonstration projects, and spreading them quickly across the state, will be vital to developing stronger school-employer links. Incidentally, this approach to developing clear demonstration projects with relatively small amounts of additional funding is exactly what lies behind our proposals for a District Redesign competition in Chapter 3 and for an Accelerated Learning Challenge in Chapter 5.

Strengthening school-higher education links

Massachusetts has one of the largest concentrations of world class higher education on the planet, and has a unique opportunity to build successful school and higher education partnerships. In particular, these partnerships with higher education can play a significant role in tackling the Top Talent Gap we have identified. The critical role higher education institutions can play in preparing teachers, and the need to raise the quality of this teacher preparation, has been covered in Chapter 4. In addition, these institutions can play a wider role by helping students prepare to meet the expectations of college-level work. Higher education partnerships can be used to promote student understanding of what they need to achieve to go to university, give them access to higher-level material and ensure that high school teachers in particular understand the links between their teaching and what students will go on to study. There are already examples of this in Massachusetts.

Boston University, for example, has developed Boston University Academy – a high school located on the university site which provides students with access to its resources and facilities and helps prepare them for college study. The Edgerton Center at MIT is another example which provides science and engineering field trips for primary and secondary school students. And Massachusetts College of Liberal Arts is leading the Berkshire Compact to promote access to higher education for all students.

Further afield, there are other programs in the US which are having an impact. The College Track[22] program in California is an after school college preparatory program that provides access to a range of academic and social support to low-income students from before 9th grade until they graduate. It has already achieved impressive results, with 90% of seniors graduating from high school college-ready and on track to complete their course. Students attend a range of courses that both support their studies and help them prepare for college admission, but which also allow them to explore their wider interests and constructively engage in their communities through active civic participation.

Massachusetts should build on these successful examples of school and higher education partnerships. In particular, we think the DESE should collaborate with the state's many colleges and universities to develop further online resources and material that high school students can access before they apply and attend college. Higher education institutions should also develop a much greater range of opportunities to stretch academically gifted students through such routes as online courses, weekend opportunities, summer schools and dual enrollment opportunities. They might also take a direct role in setting up and establishing new schools, particularly virtual or hybrid schools where they already have much relevant expertise, as recommended in Chapter 2. In addition, large numbers of university students could be used as mentors for high school or middle school students. A number of programs around the world have demonstrated the value of such schemes both to school students and mentors, when these are designed well. It is vital that the university students are trained for the role and incentivized not to drop out of the program during the course of the year; meanwhile, at the school end, the mentoring program needs a senior member of the faculty to coordinate it and ensure it is effective.

Conclusion

Massachusetts has an opportunity and an economic imperative to lead the nation in closing the Opportunity Gap. Doing so will require a much more systematic approach to learning what works in tackling achievement gaps at a school level. It will require stronger partnerships between schools and communities, employers and the higher education community. The knowledge gleaned from system reform in K-12 and early education will have to be applied. Crucially, success depends on mobilizing the wider community and especially key stakeholders such as business and higher education. The key message is that, to be first in the world, Massachusetts will need the entire state to get behind the school system. More radical systemic innovation is needed to address the out-of-school inequalities of opportunity which disadvantage low-income and minority students. Below are the primary recommendations from this chapter, both short and long term.

Endnotes

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4 Investing in Our Future: The Evidence Base on Preschool Education, October 2013

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7 Associated Press, January 2, 2014

8 PISA 2012 results show Australia, Canada, Estonia, Finland, Hong-Kong China, Japan, Korea, Lichtenstein, and Macao-China are education systems combining high levels of performance with high equity.

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11 More details of the program can be found at http://www.bc.edu/schools/lsoe/cityconnects/

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14 Financing Expanded Learning Time in Schools: A Look at Expanded Time in Five District Schools, 2014

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18 Dr. M.F. Fitzgerald, The Changing Face of Career and Technical Education Part 2, September 2012

19 Taken from the MBAE's publication, Educating a 21st Century Workforce, October 2008

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21 http://www.educationandemployers.org/who-we-are.aspx

22 http://www.collegetrack.org

RECOMMENDATIONS

By 2016 Massachusetts should:

- Produce an implementation plan for high quality early education with the first phase of the plan focusing funding on children from low-income families.
- Establish a stronger evidence base about the most effective teaching practice for closing the achievement gaps at a school level.
- Pilot the use of Personal Opportunity Plans for students who need to catch up.
- Promote the lessons about effective school-community partnerships learned from the Wraparound Zone Initiative.
- Implement proposals to strengthen school-employer links and develop new school-higher education partnerships.

RECOMMENDATIONS

By 2020 Massachusetts should:

- Develop a high-quality universal pre-K offer.
- Promote new expertise in strategies aimed at closing achievement gaps through the work of the Innovation Collaborative.
- Enable widespread use of Personal Opportunity Plans.
- Establish a market for high-quality after school provision.
- Incentivize new effective models of school-community-business-higher education partnerships across the state.

CHAPTER 7

FUNDING

MASSACHUSETTS SHOULD:

- Establish a new set of principles for funding the state's public school system.
- Establish a minimum proportion of funding that must be delegated to schools.
- Ensure that districts distribute funding to schools on the basis of a transparent, weighted student formula that rewards success.
- Set an expected level for the core budget for three years ahead and introduce a separate funding channel to support innovation and other vital state priorities.
- Introduce Productivity Reviews as a means of ensuring that every dollar of taxpayers' money is being used effectively.

Around the world, funding systems in government have a habit of becoming complicated, opaque, inefficient and disconnected from outcomes. For example, a few years ago, Michael (Barber) wrote in a note on the education funding system in England:

> *"…we're all frustrated with the present system. We have no way of ensuring that the money we put into education either gets spent on education or reaches the schools. We are unhappy with the way money is distributed among (districts) by our complex formula… Teachers hear the Prime Minister and ministers announcing large new programs, they hear us repeat the £19 billion figure, yet it is by no means certain that the new money will ever reach them and indeed a substantial minority of schools will be worse off this year... To make matters worse, we divide (our funding) into lots of small packages, inhibiting schools' discretion and contravening our principle of intervention in inverse proportion to success. On the other hand, when we merge several grants into one … bureaucratic pressures force us to break them up again… In short, the mechanisms are confusing, the policy is muddled and so are we!"*

This lament might have been made, with minor variations, by leaders in many education systems across the US and around the world at almost any time in the past two decades, and is relevant in Massachusetts today. In the US the complexity is often greater than elsewhere, not because administrators or politicians are any less effective, but because the separation of powers between executive and legislative as well as between federal and state levels ensures competing interests and incentives, overlapping accountabilities and compromise. Increased complexity can also result from a desire to achieve greater fairness – for example the development of the Chapter 70 education aid formula in Massachusetts was clearly motivated by a desire to eliminate the disparities in education spending between districts.

In Massachusetts, the long tradition of local control adds to this complexity and raises a number of other challenges. A particularly unfortunate consequence of the complexity of

the system for funding public education is the difficulty in ascertaining the links between funding and outcomes. Can the system adequately determine and fund the institutions and practices that improve student outcomes, and can it stop funding those that don't? Moreover, funding complexity can undermine accountability. If schools are not free to spend the funds they receive in whatever way they choose, then schools may well be justified in saying it is unfair to hold them to account for the results of this spending. It also makes it more difficult for the education sector to make its case for a greater share of public funds, especially at a time when there will be increasing competition for any new public funds.

Generally speaking, year after year, the political system muddles through these difficulties. But sometimes a more fundamental reconsideration of the funding system is needed - one that goes back to first principles. This is what happened in Massachusetts with the passage of the 1993 legislation. Now, 20 or more years later, another such moment has arrived. In this chapter we set out a revised set of principles on which an effective and fair funding system might be based and test the current system against them. We propose changes that would involve a greater devolution of resources to schools combined with a strong focus on the notion of productivity at district and school level.

Principles for an effective funding system

Principle 1: In an education system, the money is for the students

At one level this is a statement of the obvious; at another it requires a fundamental shift in thinking. The logic of this principle is that when the legislature on behalf of the citizens allocates funding to the school system, that funding should be spent at the frontline, as close to the student – the intended beneficiary – as possible, and in ways that improve student outcomes. Any spending that is remote from students, on district or state administration, for example, must be explicitly justified. There should be clear transparency in how much funding is being given to schools and how much is being withheld by districts for administration or other centrally provided services. It also means that the funding should follow the student – whichever schools they choose to go to.

Principle 2: Funding needs to be both universal and targeted

In order to be fair, the funding system needs to provide both adequate funding for every student – making it universal – and extra targeted funding for students who, for whatever reason, face a greater challenge in achieving the standards the state demands. The logic of this principle points to a weighted student funding formula and targeted funding for low-income and special education students, for example. This means the funding should be distributed on a weighted basis from the state to districts, but also from districts to schools.

Principle 3: Fund outcomes not programs

Too often, governors, secretaries or legislators fund specific programs rather than the outcomes they want to see. The intention is good – that the money should be spent on what they intend it to be spent on – but the cumulative consequence is highly problematic; lots of small parcels of funding, each with their own reporting system and each often unconnected to and overlapping with many other programs. Federal grants generally reinforce this problem. Much better would be to set specific outcomes that are desired, such as higher graduation rates from high school, and combine funding streams and administrative effort to deliver those outcomes. Given the possibility of waivers from the Federal government, at least at present, there is an immediate opportunity to progress towards a new, better way forward.

Principle 4: Transparency matters

Frederick the Great once said, "Finances are the nervous system of a country; understand them and you will be the master of everything else." Given the complexity and opacity of funding in many education systems, including Massachusetts', very few people are able to understand how the system works or what the likely consequences of funding decisions might be. It leaves mastery in the hands of a few. By contrast, transparency, which depends in part on simplicity, provides citizens with the opportunity to see how their tax dollars are spent and what impact they make; it makes them the masters and places an obligation on the system at every level to explain how funds are used.

Principle 5: Think long-term as well as short-term

Annual budget cycles inevitably focus on the year in question, and it is of course vital that adequate funding is made available each year. Given the fiscal realities and the

cyclical nature of economies, steadiness in funding allocation is often as important as the actual level. So how might the good years be used to prepare for the lean years, for example? Moreover, if Massachusetts is to lead the world 20 years from now it also needs to invest in its long-term future. For example, if Massachusetts is to become a global leader in innovation in assessment, as we have argued, it will need to think about how to invest in that over not just one year but a number of years. Longer-term thinking would also mean giving schools greater certainty over a longer period (say two or three years) about what budget they should expect, and allowing them to retain and carry over any productivity gains.

Principle 6: Provide demonstrable value for every tax dollar

It seems unlikely that the willingness of citizens to pay more taxes will increase significantly, especially given the squeeze on incomes for the majority of Americans. If extra money is available for government, it is clear that education will have to make its case vigorously and powerfully at a time when other demands, such as the costs of an aging population, are growing. The era of austerity has also led to a focus on what tax dollars actually deliver in terms of results, and that pressure is unlikely to diminish. It therefore makes sense for the education system to lead the way in demonstrating the value it delivers. This will not only help combat skepticism among taxpayers about what they get in return, but also help to make the case over the long term for extra funding for education. Taxpayers are likely to be more willing to invest in success than in failure.

> Any spending that is remote from students, on district or state administration, for example, must be explicitly justified.

Establishing the underlying principles is not easy, but it's much easier than adhering to them in the day-to-day processes by which budgets are arrived at. David Osborne (a citizen of Massachusetts) and Peter Hutchinson describe in *The Price of Government* a five step process for arriving at a budget, based on their experience of working with state and local governments around the US, which we summarize here.

1. **Getting a Grip on the Problem.** Is it short or long term? Is it driven by revenue or expenses or both?
2. **Setting the Price of Government.** Determining how much citizens are willing to pay.
3. **Setting the Priorities of Government.** Deciding which results citizens value most.
4. **Setting the Price of each Priority.** Deciding how much the government will spend to produce each of these outcomes.
5. **Purchasing the Priorities.** Deciding how best to produce the desired results at the price citizens are willing to pay.

Taking this kind of approach, at least periodically, has the advantage of not assuming the budget status quo and just adding or subtracting a percentage; rather it involves going back to first principles and budgeting from the bottom up. It also makes it possible to adhere to Principle 3 above and fund outcomes rather than programs. Finally, it is consistent with being open-minded about how to provide the service rather than assuming that the preexisting arrangements are best. It is therefore entirely consistent with the case we make in Chapter 3 for a redesigned district approach.

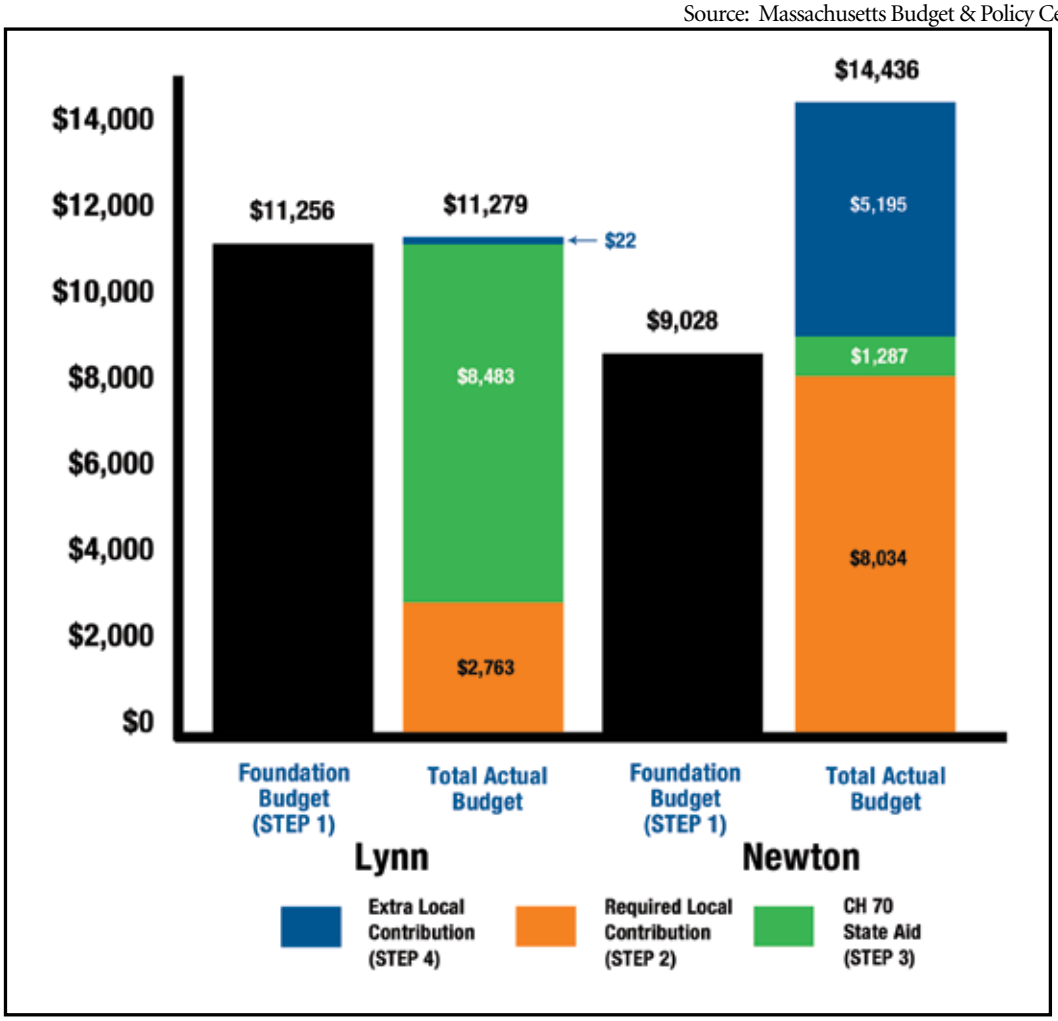
The current Massachusetts funding system

We start this section with a short explanation of how the current funding system works in Massachusetts. The Chapter 70 education aid formula was created by the Education Reform Act of 1993 in response to the significant differences in property wealth between districts and levels of local commitment to education which resulted in extraordinary disparities in education spending between districts[1]. Chapter 70 now provides the state's primary means of distributing K-12 public education funding to local and regional school districts. "The formula aims to ensure that each school district has sufficient resources to provide an adequate education for all of its students, taking into account the ability of each local government to contribute from its own revenues, principally derived from property taxes. In short, the formula is designed to have an equalizing effect, with less wealthy districts receiving more state aid than wealthier ones."[2] Funding for each district is calculated using the steps set out by the Massachusetts Budget & Policy Center below:

1. **Calculate the district's Foundation Budget.** Multiply the number of students at each grade level and demographic

Figure 1: Illustration of the Foundation Budget Calculation for Districts

Source: Massachusetts Budget & Policy Center



or program group (e.g., low-income, special education, English language learners) by anticipated per-pupil spending for each group.

2. **Determine required local contribution.** Work out expected local contribution based on an analysis of local property and tax base.
3. **Fill the gap with the Chapter 70 contribution.** Determine the gap between local contribution and the foundation budget that Chapter 70 needs to meet.
4. **Districts are free to add to Chapter 70 aid.** Local Districts can contribute more than the minimum local contribution. Many wealthier districts do.

Figure 1 above from the Massachusetts Budget and Policy Center illustrates the outcome of the process for two very different districts. As it shows, the outcome is not equal levels of funding for districts. Districts are free to add to the state contribution and many do, but the aim is to ensure that all districts are able to meet the minimum level set by the Foundation Budget.

Testing the current funding system against our principles

Our first principle was that in an education system, the money is for the students and as much funding as possible should be spent as close as possible to the student. In relation to this principle we asked the US Education Delivery Institute (EDI), a non-profit organization that works with the DESE's Delivery Unit, to examine spending patterns across Massachusetts school districts, using DESE data for the fiscal year 2011-12. They looked at the variation in reported spending on administration as a proportion of total per-pupil spending (including spending outside the general fund, such as grants, private donations and revolving accounts).

Figure 2 shows the variation in spending on administration by District Size Quartile, where the largest districts are in Quartile 4 and the smallest districts are in Quartile 1. Spending on administration as a proportion of the total budget is higher for the smallest districts, but there is variation in spending amongst all districts sizes with some significant outliers particularly for districts in the first three quartiles. This analysis suggests there may be further scope for reducing the proportion of the budget being spent on administration at a districts level, particularly amongst the smallest districts, which supports the push for greater collaboration between these districts as part of the districts redesign competition in Chapter 3.

We also asked the EDI to look at spending in the categories which might be most closely related to instructional improvement and therefore be spent at school level, including Instructional Leadership, Classroom and Specialist Teachers, Other Teaching Services, Instructional Materials, Equipment and Technology, Guidance and Psychological. Next, they looked at other categories of spending, such as Professional Development, Pupil Services, Employee Benefits and Fixed Charges, likely to be held at district level and take a significant proportion of the funds away from school level.

Figure 3 shows the variation in spending across these categories by district as both a dollar amount and a proportion of total funding. Dark blue categories are those we think are most likely to be spent at a school level, and light blue those most likely to be held at a district level. Each dot represents a district. The lowest line indicates the second quartile, the middle line indicates the median, and the top line indicates the fourth quartile.

Drawing firm conclusions from this analysis is difficult, and it should be noted that different districts will categorize the same spending in different ways. Nonetheless, it seems immediately apparent that there are large variations in the proportion of budget being spent in a number of categories. For those districts with above average spending in non-core instructional areas, reducing this spending, even just to the average level for their district size, would potentially free a significant amount of resources that could be given directly to schools and spent on core instructional activities.

Our second principle was that funding should be both universal and targeted. Here the Chapter 70 formula was largely effective, at least initially. During the mid and late 1990s, Chapter 70 funding increased by $1.5 billion, with annual growth rates of over 10%, bringing all districts up to the Foundation level required to meet basic student needs.

Figure2: Spending on Administration by District Size

Source: US Education Delivery Institute

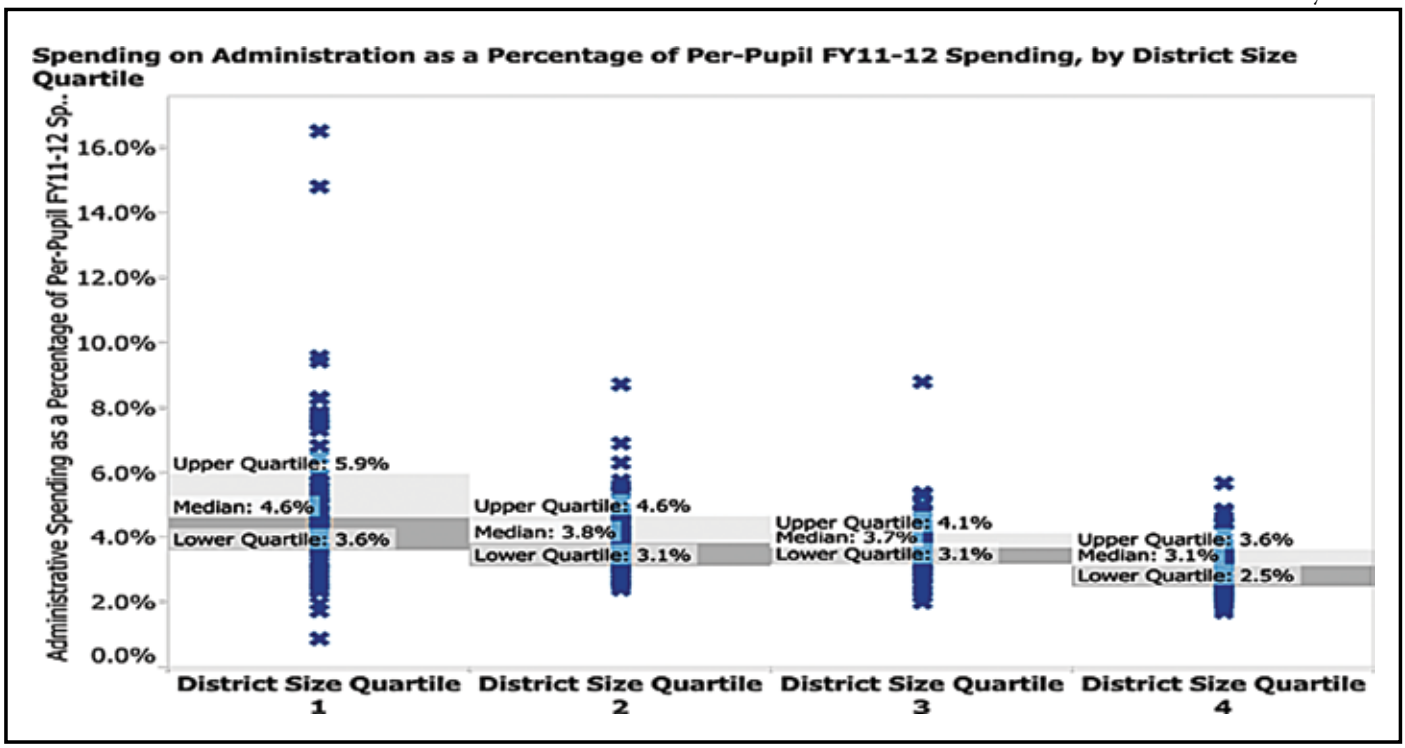
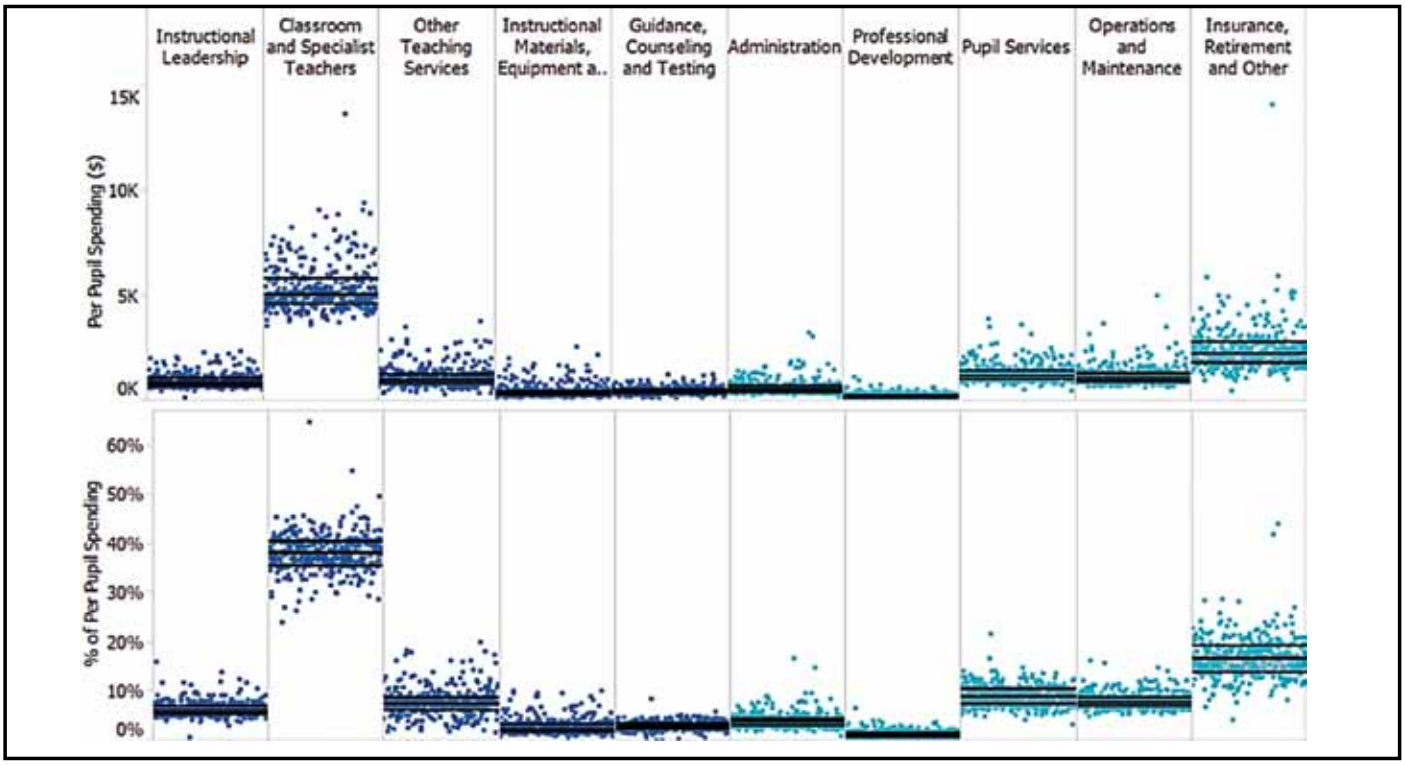


Figure 3: Distributions of spending per pupil and percent of per pupil spending, by category and district, FY 11-12

Source: US Education Delivery Institute



It also enabled a closing in the gap between the per pupil spending of the lowest and highest income districts, in the 1993 financial year this gap stood at $1,400 per pupil; by 2000 the gap had narrowed to $370 per pupil.[3]

However, in more recent years questions have been raised about how well the Foundation Budget is meeting the needs of districts. MBAE's own recent report, *School Funding Reality: A Bargain Not Kept* showed that although poor districts had risen to within 3% of the Foundation goal by 2000, they had fallen back down to 16% below by 2010.[4] The Massachusetts Budget and Policy Center has also undertaken analysis which shows major gaps in what the Foundation Budget says districts needed for certain cost categories in the 2010 fiscal year and what districts actually spent. These gaps are largely driven by higher costs in two areas – Special Education and health insurance – as well as by not fully adjusting for inflation. The consequences of higher spending in these two areas means that most districts spend less in crucial areas, such as regular education teacher recruitment, than the Foundation Budget sets as an adequate baseline. Only the wealthiest districts are spending at foundation levels, and spending is lowest in urban centers, as Figure 4[5] below shows.

The DESE's analysis of the Foundation Budget shows that, in the 2010 financial year, districts with the highest percentage of low-income students were still receiving the highest Foundation Budget and Chapter 70 Aid, and had higher per-pupil funding than the higher income districts. This suggests that the basic aim of ensuring districts with higher needs receive more state funding is still being met.[6] Whether the additional amounts are sufficient is a matter of judgment, and a fuller range of analysis and evidence would be needed than provided by the MBAE and MassBudget studies referred to above.

Our third principle is that the aim should be to fund outcomes rather than programs. Here we have heard a number of complaints about the reporting requirements of different funding streams. A number of these have been federally imposed as part of Race to the Top. The end of this funding, and the general willingness of the federal government to consider waivers, offer new possibilities in the future. Attention therefore also needs to be focused on the

legislature's own requirements, to ensure that funding from the state is combined around outcomes wherever possible and that the data collection process is simplified and redundancies are eliminated.

There is also little in the current funding system that rewards success – districts and schools receive the same amount of money regardless of outcomes achieved. An example of an alternative approach is provided by Lawrence, which plans to offer awards to schools that meet their performance targets in 2014-15. Teachers at the school will determine how the funds from these awards are used and distributed. In general, the state needs to avoid the common problem of throwing good money after bad; if a school or district is receiving adequate funding and at the same time underperforming, then the problem is one of leadership and execution, not funding. In short, success should be incentivized and failure tackled.

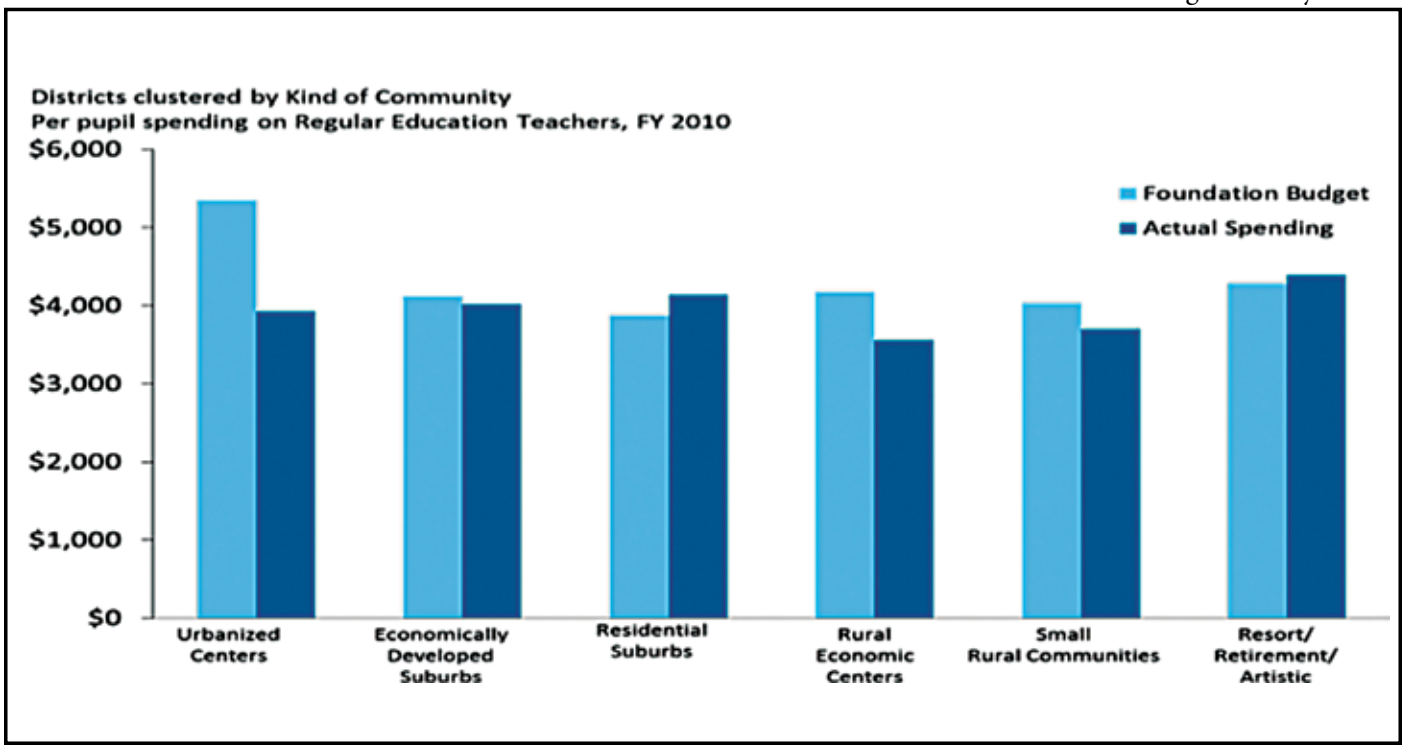
In relation to the fourth of our principles, transparency matters, evidence about the current system presents a mixed picture. There is a wealth of data about the levels of funding and spending of each district available openly as part of the District State Profile.[7] This includes a breakdown of spending against a number of categories. However, as we noted earlier, it is difficult to tell exactly what sits within each category, and whether districts have classified their spending in a consistent way, so as to present a truly comparable picture. More consistent reporting of district and school data on spending is therefore needed and Massachusetts should promote more consistent use of accounting and budgeting documents at a district and school level.

There is also little in the current funding system that rewards success – districts and schools receive the same amount of money regardless of outcomes achieved.

In relation to our fifth principle, think long-term as well as short-term, the key test of the current system is how well it provides certainty to schools and helps to plan for the long term. Here again the evidence is mixed; in its early years, Chapter 70 Funding grew on average by 10% a year, and this provided a degree of certainty for schools about what to expect in future years. The impact of the recession has made funding much less certain in recent years,

Figure 4: Spending on regular education teachers by district type

Source: Massachusetts Budget & Policy Center



although federal stimulus funds have allowed the state to maintain Foundation levels, and for the 2012 and 2013 financial years, Chapter 70 aid increased again by 3.6% and 4.5% respectively. [8]

Given the uncertainty about future funding, we argue below that it would be sensible to set a baseline level for core Chapter 70 funding for the next three years, and to focus the debate on priorities for any additional funding that might become available in the coming years. Any additional investment available – including the savings generated from increased productivity – should be directed at supporting greater innovation in the system, teacher and leadership development, and proven interventions for low-income students, including extended time and increases in access to early education.

When it comes to the sixth of our principles – providing demonstrable value for every tax dollar being spent, the analysis possible on the statewide data about district spending provides only limited insight into where it is most effective. To return again to the EDI's analysis of spending by districts on those activities most closely correlated with instructional improvements, Figure 5 shows that districts in the upper quartile of spending spend up to twice as much per pupil as the lowest spending district on activities associated with instructional improvement.

However, when it comes to the link between this spending and the outcomes achieved by students (as measured by the percent of students who are proficient or advanced on MCAS English language arts and math tests in 2012), Figure 6 below shows that although there is a positive correlation, it is relatively weak.

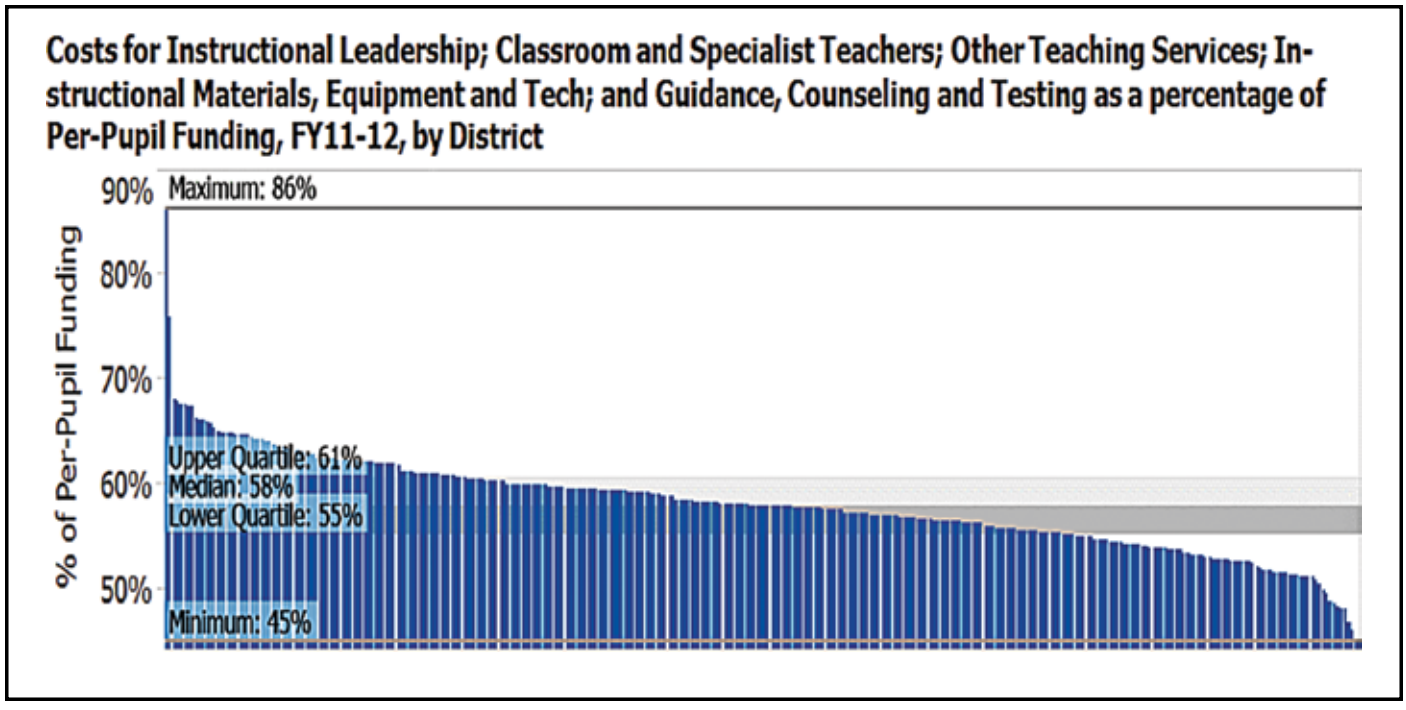
The DESE has undertaken similar analysis and reached a similar conclusion: that funding appears to be a necessary, but not sufficient, condition for effective teaching and learning.[9] DESE looked more closely at the use of resources in schools which had been commended for their performance. Even among these schools there was significant variation in spending, and the DESE concluded that the analysis provided insufficient insight into models of efficient and effective resource allocation. Given these difficulties in analyzing the use of resources at a district and school level using the existing data, Massachusetts needs a new tool to increase transparency in the use of funding and to demonstrate more clearly the value of spending to taxpayers.

What should a future Massachusetts funding system look like?

In the short term, Massachusetts needs to ensure that more funding is being spent directly by schools. This is consistent with our argument in Chapter 3 that schools need to have

Figure 5: Spending on instructional activities by district

Source: US Education Delivery Institute



greater responsibility for their own improvement. To hold them fairly accountable for successfully improving, schools need to control a greater proportion of their budgets. Massachusetts should therefore set a clear expectation of what proportion of total funding – both that provided by the state and by districts themselves - should be distributed to schools.

In setting this level, Massachusetts should start by looking at the current levels of spending on administration and other non-core instructional activities. As Figure 2 showed, the median spend of all districts, whatever their size, on administration is currently below 5%. And as Figure 3 showed, the median level of spend on the highest category of non-core instructional spend - insurance, retirement and other benefits - is only 17%. If all districts reduced their share of spending on administration and other non-core instructional spending to the median, they would be able to increase the proportion devolved directly to schools.

There are also opportunities for greater efficiencies to be gained here, especially for smaller and lower-enrollment districts, from our proposals in Chapter 3 for greater district collaboration which should enable them to reduce administrative and other non-core instructional spending further. We therefore recommend Massachusetts should start by introducing an expectation that in every district 75-80% of

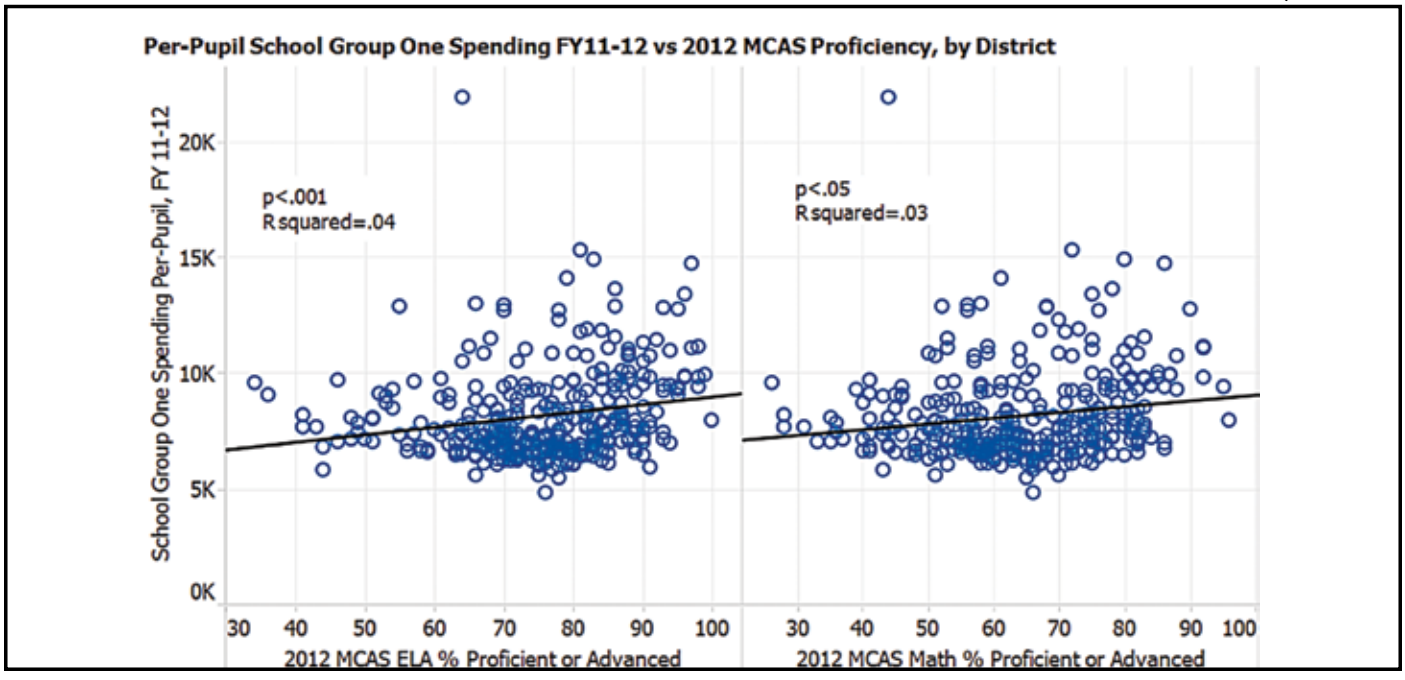
> Massachusetts needs to ensure that more funding is being spent directly by schools.

all funding should be distributed to schools by 2015, and look to increase this proportion in subsequent years.

Massachusetts should also ensure funds are being distributed on the basis of a weighted formula that takes into account variations in the student populations at particular schools (see box on next page for a simple explanation of what this would involve.)[10] Of course Massachusetts already has a weighted formula at a state level as part of the Foundation Budget. However, there is no requirement that districts distribute their budgets on a similarly weighted basis. Some districts, including Boston,[11] have chosen to do so, arguing that it increases both fairness and transparency. Many others haven't – with locally bargained teacher union contracts that control staff assignment acting as a major barrier. Our proposals in Chapter 4 to develop a new grand bargain and move towards a thin statewide contract are a critical part of enabling a move to greater weighted student funding at a district level therefore. We would also recommend that Weighted Student Funding should be a

Figure 6: Comparison of per-pupil spending and student outcomes by district

Source: US Education Delivery Institute



minimum requirement for districts applying to the district reform competition set out in Chapter 3.

There is also a critical link here to our argument in Chapter 3 that all schools should be given greater freedom and flexibility over their budgets and staffing. There is no point delegating more funds to schools if the schools themselves cannot choose how to spend the money. Eric Hanushek has made this point forcefully,[12] arguing that:

> *"Local schools have no control over teacher salaries or, for the most part, over the choice of teachers. Thus, the added dollars from the weighted student funding seldom empower them to make choices that improve the quality of teachers. As a result, the benefit of additional funding in a world where the quality of teachers is unrelated to the salary of individual teachers is murky at best."*

If, on the other hand, schools have freedom to hire and fire the teachers of their choosing, and have to balance the spend on teachers with spending on other staff and direct support for students, then they can truly be held accountable for whether the decisions about their budgets are resulting in improved outcomes.

If they are to be held accountable for how they spend their budgets, one might reasonably suggest that the schools which achieve the best results for students – measured by student outcomes or student growth – should be rewarded for their success. And, conversely, schools that do not achieve improvements for students should not continue to receive the same level of funds – the principle of not throwing good money after bad. Massachusetts should look for proposals that would incentivize and reward schools for their success as part of the proposed district redesign competition. Lawrence has already provided one model with its proposed school level awards.

We also support current efforts to ensure that a greater proportion of the Foundation Budget is being spent on the areas for which it is intended. The fastest-growing costs have been in health insurance and funding for Special Education students. On the first, the MBAE's analysis of the increasing costs of healthcare was instrumental in new proposals giving districts more freedom to purchase their health insurance through the state's Group Insurance Commission (GIC), and it seems sensible to incentivize more districts to take up this option, as the DESE recently recommended in its report on the status of the public education financing system in Massachusetts.

In relation to costs for Special Education, the Thomas B. Fordham Institute recently published a paper

WHAT IS Weighted Student Funding?

"Some policymakers have called for an end to allocations based on staffing levels, favoring instead a system that distributes dollars – rather than staff – to schools, using a student-centric formula (called student-weighted allocation or weighted student funding). The idea behind student-weighted allocation is to incorporate all baseline education and additional student resource needs into a formula. This system assigns "weights" to pupils according to their different educational needs and the cost of meeting them. Common categories for weighting include special needs, poverty, limited English proficiency, vocational education, grade level and gifted education." Massachusetts already weights the funding it distributes from the state to districts through the Foundation formula. Districts are then free to choose how they distribute their dollars to schools.

Source: Understanding Student-Weighted Allocations as a Means to Greater School Resource Equity' K.H.Miles and M Roza 2006.

recommending how states could reduce Special Education costs further (shown below).[13]

Massachusetts has already pursued a number of these strategies, including the development of multi-district collaboratives that pool district budgets to pay for Special Education provision.[14] However, we heard some evidence during our consultations that participation in these collaboratives was not as strong in some areas of the state. We recommend Massachusetts should look to incentivize all districts to participate in collaboratives. Where districts who are eligible to participate in collaboratives choose not to do so, the State should limit the funding to these districts for Special Education to the amount being spent by members of the collaborative; the goal always being to free up funds for schools and students.

In the longer term, Massachusetts should consider the option of funding schools directly on a statewide basis. This would have a number of advantages. It would guarantee much greater transparency in the level of funds each school receives, it would guarantee that weighted student funding really did follow the students who need it most, and it would strengthen the accountability for outcomes because schools with similar student profiles and demographics would all be receiving a similar level of funding. Districts could still be free to supplement the funds being spent by schools, and a small proportion of funds could still be available to districts to pay for their administration costs. Schools would be free to pool and use their resources jointly at district or regional level, if they thought that would achieve better value for money but, crucially, that would be their decision.

APPROACHES TO reducing the costs of Special Education

1. District Cooperatives. Many districts – including Charter schools, which often comprise their own mini-districts – do not have the requisite size and capacity to serve high-need students effectively and affordably. Multi-district co-ops, such as the existing Massachusetts collaboratives, allow both for economies of scale and for better service delivery for these children.

2. Student Funding Based on Multiple Weights. Special Education funding systems based on average student needs may be easily administered, but can also lead to inefficient and ineffective resource allocations. Weighted student funding is a tiered system of resource allocation that allows for a more rational and effective distribution of funds, enabling districts with more high-need pupils (or pupils who require more dollars to pay for their IEP-mandated services) to receive more money, while jurisdictions that need less receive less. Basing weights on the services children need rather than on disability diagnoses significantly improves the accuracy of this system.

3. Exceptional-need Funds. Districts (especially small ones) sometimes find themselves overwhelmed by the high cost of educating one or two particularly needy children. This type of fund, managed and predominantly financed by the state, acts as an insurance mechanism for districts that can't cover the full cost of educating high-need pupils along with all others under their purview.

M. Richmond and D. Fairchild Financing the Education of High-Need Students November 2013

Innovation

Outside of the core funding, we believe the state should create separate funding streams to support innovation and other immediate priorities. This should help to ensure greater stability in the core funding for schools, and avoid it being utilized for purposes other than those intended. It would initially be used to pay for the district competition identified in Chapter 3 to incentivize new models of district organization and school clusters, and to fund the Massachusetts Accelerated Learning Challenge and Innovation Collaborative identified in Chapter 5. The other immediate priorities for additional funding identified in this report are the extension of access to high quality early years education programs for low-income students and extended learning time for all low-income schools, as set out in Chapter 6.

A stronger focus on productivity

The most significant recommendation in this Chapter is that Massachusetts must find a new way to assess the effectiveness of the use of public funding if it is to demonstrate value for taxpayers' investment in education and justify any further increases in spending. We recommend developing Productivity Reviews to provide a practical way to address an aspect of education systems that everyone knows is important: productivity, the ratio of outputs to inputs, or 'bang to buck'.

Too often, because it can rapidly become complicated and theoretical, the issue of productivity is not acted upon systematically. Economists will, and should, continue to wrestle their way towards a convincing theory of public productivity or public value. In the meantime, there is a need for systems to address the issue as best they can, not just because it is clearly of vital importance, especially in an era of austerity, but also because only by addressing it in a practical way now can people at school, district and state levels begin to learn what it takes to drive productivity and discuss the trade-offs involved. As Arne Duncan has put it:

> *"It's time to stop treating the problem of educational productivity as a grinding, eat-your-broccoli exercise. It's time to start treating it as an opportunity for innovation and accelerating progress."*[15]

Our proposals below build on the work of Marguerite Roza,[16] Education Resource Strategies[17] and the Center for American Progress,[18] who have all helped to put the issue of productivity on the table. The latter developed three measures of productivity (outlined in the box on the next page) which have allowed for comparisons to be made in terms of district per-pupil spending and results achieved.

> "Some schools and districts are already achieving more than others with the same funds or less."

The Center recognizes that none of the measures they have developed are perfect, and there are important limitations in terms of the data available about spending, but they argue the benefits of bringing greater transparency to the debate about productivity outweigh these limitations. It has also helped to put on the table a key insight, which Marguerite Roza argues is critical to the debate about productivity: "Some schools and districts are already achieving more than others with the same funds or less."

This is also evident from the analysis in Figure 5 above, where districts with similar levels of spending are achieving significantly different results, even when we account for differences in the family income of students. It is also clear from the international comparisons. As the PISA 2012 results showed the United States and the Slovak Republic achieved the same performance in mathematics, but the United States' cumulative expenditure per student is more than double that of the Slovak Republic.[19]

Such comparisons inevitably lead to questions about why this is happening. Is it the result of differences in districts' approaches to compensation, teaching loads or technology? As Marguerite Roza argues:

> *"We will only know if we delve deeper. To date nobody has been asked to have these conversations. School and district leaders have not been encouraged to consider how their initiatives add to the costs and how outcomes will compare relative to their investments."*

Our recommendation, therefore, is that Massachusetts develops a new tool for looking in more depth at district spending and productivity. Massachusetts could start to answer this question by using the Productivity Metrics identified by the Center for American Progress on the next page. This would begin to identify districts where the state might need to take a closer look and investigate spending patterns in more depth. It could also build on the work of Education

Resource Strategies, who works with districts to undertake a more detailed analysis of their spending and the trade-offs involved, to consider whether they are achieving the maximum output for the investment they are making.[20]

We call this approach a Productivity Review, and it is based on the framework on the next page. Although presented as a mathematical equation, we recognize it will not be based on purely arithmetical calculations, at least in the early stages of its use. It is also important to say upfront that the component parts of the framework are not intended to be of equal value – greater weight for example should be given to the measures of student achievement under part A. However, it is also important not to focus solely on measures of student performance – districts and schools need to take a wider view than this and look at feedback from parents and students as well as considering their longer term organizational health which are measured by parts B and C of the framework.

We propose the Productivity Review is used initially at the district level, and it would need to be carefully piloted. We set out below our current thinking for how Massachusetts might use such a framework, but we recognize more work will be needed to develop the framework in light of its early use. Once tried and tested, the approach might be applied at other levels in the system, for instance in allowing groups of schools to look at each other's productivity on a peer review basis.

CASE STUDY:
Center for American Progress district productivity ratings

The Center for American Progress has developed three measures of productivity that allow comparisons to be made across districts. The results are published on a website that allows users to compare spending and achievement rates across districts in Massachusetts and other states.

1. The Basic Return on Investment index rating. This rates school districts on how much academic achievement they get for each dollar spent, relative to other districts in their state. To avoid penalizing districts where education costs are higher, adjustments are made for a variety of factors including cost of living differences as well as higher concentrations of low-income, non English speaking, and special education students.

2. The Adjusted Return on Investment index rating. This uses the same approach as the Basic ROI but applies a regression analysis, to account for the higher costs associated with serving larger concentrations of low-income, non English speaking, and special education students. The adjustments, or weights, used in the Basic ROI are not always sensitive enough to account for spending differences within states.

3. The Predicted Efficiency index rating. This measures whether a district's achievement is higher or lower than would be predicted after accounting for its per-pupil spending and concentrations of low-income, non English speaking, and special education students.

Return on Educational Investment: A District by District Analysis of US Educational Productivity, January 2013.

A Framework for Productivity Reviews

Part A examines the academic results or outcomes the system aspires to, the degree of ambition, the progress made towards goals and, where it is too early to tell, what can be learned from lead indicators, as outlined in Figure 7 below. Here Massachusetts already has extensive data that a Productivity team could examine, and the quality of this data will continue to improve. At its simplest, a measure of productivity would take these outcome measures and 'divide' them by the inputs (essentially this is what the Center for American Progress measures of productivity do) and reach a measure, but we would argue the productivity of an education system is not that simple.

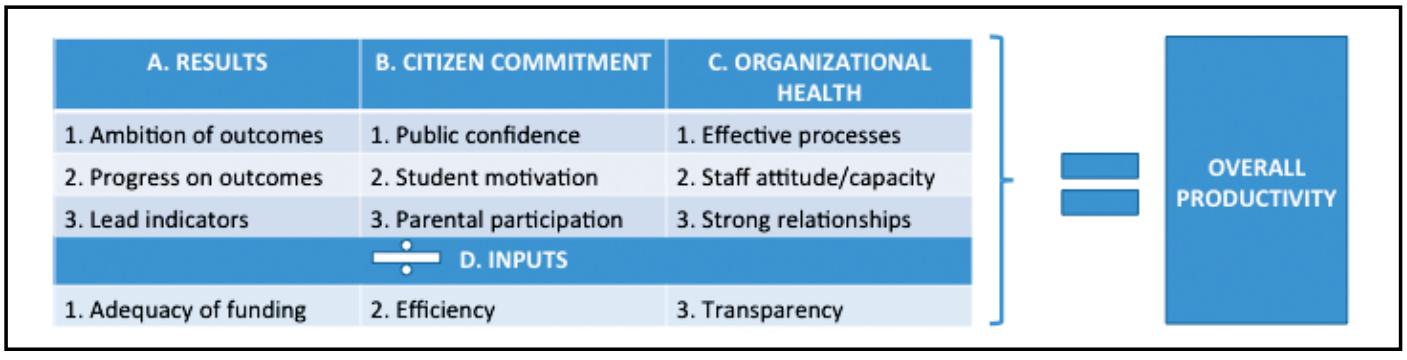
Part B of the framework measures the views of citizens, students and parents. As Mark Moore, from Harvard Kennedy School has argued in 'Public Value', an education (or other public) system also needs to generate public confidence, partly because that will help ensure its longevity, but also because public confidence is itself a desirable outcome. Moreover, if students are motivated and parents actively supportive, then that will affect the academic outcomes positively. For this element of the framework, Massachusetts would need to begin to collect, and make available on a routine basis, survey data to enable comparisons of public, parent and student attitudes across districts. Even without productivity reviews, such data would be powerful and valuable.

Part C of the framework is designed to ensure that those who have stewardship of the education system at each level think not just about the present and the delivery of results this year and next, but also think about the long-term health of the system – its resilience and capacity to anticipate and manage change over time. This is what marks out truly successful organizations and will be essential if Massachusetts is to make the necessary improvements over a 20-year period. This resilience comes from having effective processes, such as budgeting or contracting, in place, from having staff, especially teachers and principals, with the right attitudes and capacity, and from having great relationships between districts and schools, and districts and state. This part of the framework would require valid and reliable surveys of teacher and staff attitudes and motivation, which would in any case have intrinsic merit. It would also encourage districts to compare how they went about vital processes and relationships, and therefore to learn from others how to improve these. The state could begin to assemble examples of best practice too. A model for this already potentially exists in the district reviews carried out by the DESE.

Part D of the framework then examines inputs. Are these adequate? Are these used efficiently? Can the citizen follow the money through the system in a transparent way? To make the review feasible, key financial data would have to be made available and comparable across districts, not just at an aggregate level, but also on specifics such as healthcare costs for employees. This is where Massachusetts needs to rapidly improve the reporting from school level of how money is being spent. Reporting requirements need to be simplified, but made consistent, so that schools know what they are being asked to report on and can do so easily. Again, the development of online reporting systems can only help here.

Once the detailed rubric required to underpin this framework has been developed, a team could be trained to use it and to apply it to a district. The team could consist of an external reviewer to lead it (perhaps an experienced former superintendent or state commissioner), two current superintendents from elsewhere in the state (for whom it would be excellent professional development), a teacher, a principal and one or two senior figures from the district concerned.

Figure 7: A Framework for Productivity Reviews



> Massachusetts needs to rapidly improve the reporting from school level of how money is being spent.

On each of the four major aspects of the framework, the team would reach an overall judgment on a four-point scale from Green to Red. After several reviews had been conducted, there could be analysis of what the districts rated Green in each aspect were doing that the Red-rated districts could learn from. In other words, the power of the reviews would only become fully apparent once several had been done, since this would enable benchmarking and learning across districts. They would also provide important evidence at a state level to inform decisions about prioritizing spending.

We know there is an element of subjectivity, or at least informed human judgment, in this process. It cannot, at least for the foreseeable future, be purely scientific or objective, because no such methodology has yet been developed. However, over time, as more reviews are conducted and the lessons from them analyzed, the process would become steadily more informed and more objective.

While the reviews will not solve all the problems of public sector productivity, we do think they would put the productivity issue on the agenda at every level in the system in a practical way, and make plain some obvious areas where productivity could be improved significantly. We believe the state would quite rapidly develop a common language about productivity, just as the Innovation Index set out in Chapter 5 would result in a common language about innovation. The combination of better data and the deep expertise this process would create across the state would enable it not only to make more effective use of its resources, but also to make the case more effectively to taxpayers for further investment wherever that might be required.

Conclusion

It is clear Chapter 70 has delivered many benefits to the Commonwealth, not least in ensuring that all districts have achieved Foundation level, and in ensuring that low-income districts have an equal foundation level of per pupil funding. However, in recent years, the formula has faced a number of challenges, which have called into question some of the fundamental aims of the original proposals. Perhaps most significant have been the difficulties in relation to transparency and demonstrating clear value to the taxpayer to make the case for additional funding. In this chapter, we have made a number of recommendations for how the current system could be strengthened as well as for some more fundamental reforms in the longer term.

Endnotes

1 A 1993 decision of the Massachusetts Supreme Judicial Court — McDuffy v. Sec. of Education — ruled such extraordinary disparities led to an unconstitutional denial of a minimally adequate education to children in property-poor school districts. It was this decision which led to the development of Chapter 70 funding. A copy of the McDuffy decision can be found at: http://scholar.google.com/scholar_case?case=7786925935270173646&q=mcduffy+415+mass&hl=en&as_sdt=40000006

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4 E. Moscovitch, School Funding Reality: A Bargain Not Kept. How is the Foundation Budget Working?, 2010

5 L. Schuster, MassBudget, Cutting Class: Underfunding the Foundation Budget's Core Education Program, 2011

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11 http://www.edweek.org/ew/articles/2012/06/13/35weighted.h31.html

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13 M. Richmond and D. Fairchild Financing the Education of High-Need Students November, 2013

14 For a full list of collaboratives see http://moecnet.org/

15 The New Normal: Doing More With Less, speech at American Enterprise Institute, 2010

16 See Leveraging Productivity for Progress: An Imperative for States, November 2013

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18 Return on Educational Investment: A District by District Analysis of US Educational Productivity, January 2013

19 OECD, Strong Performers and Successful Reformers in Education: Lessons from PISA for the United States, 2013

20 See District Resource Check and School Budget Hold'em at www.ersstrategies.org/info/tools

RECOMMENDATIONS

By 2016 Massachusetts should:

- Establish a minimum level of 75-80% of total funding to be distributed to schools.
- Ensure as much funding as possible is distributed by districts through a Weighted Student formula by making it a criteria of the district redesign competition, and develop new funding models that reward school success.
- Incentivize districts to reduce health insurance and Special Education costs.
- Set out an expectation for the core budget for the next three years and establish a separate funding channel to support greater innovation and other state priorities.
- Develop the productivity index with a small number of districts and publish and share the results from the first productivity reviews widely.

RECOMMENDATIONS

By 2020 Massachusetts should:

- Increase the level of expected distribution of funding to schools to 90%.
- Ensure all districts are using a Weighted Student Funding formula.
- Expand the use of Productivity Reviews to school level and use the results in the school accountability system.

CONCLUSION

The conclusions and recommendations of the preceding chapters offer direction for the future of Massachusetts education based on evidence of what is working elsewhere and what has potential to be effective in the future. When the MBAE commissioned this analysis, the organization made its intention clear. What was needed was actionable data and information that could serve as the basis for a new education reform blueprint which MBAE would develop in consultation with stakeholders across the Commonwealth. The goal is for these discussions, and the resulting agenda, to accelerate improvements in Massachusetts for the next twenty years - just as the 1993 reforms did over the past two decades.

As we stated at the beginning of this report, our task has been to offer a view from outside the system and to be provocative about what the next phase of reform might look like - and what actions would have the greatest impact on improvements. The process of consultation that the MBAE will lead over the next few months is vital to enabling Massachusetts to make the right choices about what comes next, and for building a coalition of political and public support for the transformation needed. If Massachusetts is able to keep students at the center of its agenda and let systemic innovation drive continuous improvements, it has the potential to truly unleash greatness and become the best education system in the world.

ACKNOWLEDGEMENTS

Brightlines is grateful to the **MBAE** and its Board of Directors for the opportunity to work with them on this venture. We owe a particular debt to its Chairman, Henry Dinger, Board member Beth Gamse, its Executive Director, Linda Noonan, Communications Director, Tricia Lederer, and to the members of the Advisory Group for this report for their insight. We are also deeply grateful to those who contributed time, thought and insight during our consultations.

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MBAE thanks all who participated in the interviews, workshops and discussions conducted for their contributions. We are grateful to Sir Michael Barber, Simon Day and the Brightlines team for their extraordinary work. The perspectives and expertise that our Advisory Group shared was extremely helpful and most appreciated.

Employer poll results cited in this report were taken from a survey conducted by MassINC Polling Group for MBAE, Associated Industries of Massachusetts and the Massachusetts Business Roundtable. We are grateful to our partner organizations in the business community that distributed the survey to their members and to the executives and business leaders who participated in interviews and focus groups.

Funding for this project was provided to MBAE by the Barr Foundation, the Bill and Melinda Gates Foundation and the Nellie Mae Education Foundation. We thank these foundations and all of MBAE's funders for their support.

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