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Lessons for the United States



INTRODUCTION

United States President Barack Obama has launched one of the world's most ambitious education reform agendas. The federally-funded programme "Race to the Top", initiated in 2010, represents the cornerstone of this agenda and encourages states in the United States to change their aspirations and organisational culture by: adopting internationally benchmarked state-developed standards and assessments that prepare students for success in college and the workplace; recruiting, developing, rewarding, and retaining effective teachers and principals; building data systems that measure student success and inform teachers and principals how they can improve their practices; and turning around the country's lowest-performing schools.

Chapter 2 shows what the "top" looks like internationally, based on PISA and other comparative data from the OECD. Subsequent chapters then provide descriptions of some high-performing and rapidly improving education systems – illustrating not only major characteristics of top-ranked systems, but also showing how quickly some have been able to improve and even advance to the top, as measured by PISA.

In the time since May 2010 when the preparation of this volume began, one pillar of the reform, the development of internationally benchmarked educational standards by states, is well advanced for the fields of language and mathematics, and 40 states as well as the District of Columbia have signed up for their implementation. The OECD has been privileged to contribute to the review and validation of these standards, as part of the Validation Panel assembled by state organisations. The Obama administration continues to support the implementation of these standards by investing over a billion dollars in strengthening state and district instructional standards and delivery in literacy, science, technology, engineering and mathematics, and other subjects. The preceding chapters of this volume underscore the central role that such standards play in the education systems of many high-performing education systems, but they also suggest that setting a solid set of common standards is just the first step towards the delivery of world-class instruction in the classroom.

Virtually every country featured in this volume also mirrors Race to the Top's effort to support the recruitment, development, rewarding and retaining of effective teachers and principals. Indeed, such unwavering support for excellence in teaching and school leadership is perhaps the key element of the policies and practices that drive high-performing education systems, such as those in Canada, Finland, Japan, Shanghai-China and Singapore, that are portrayed in this volume.

Both the comparative analyses in Chapter 2 and the country reports in this volume also provide ample illustration of successful efforts to turn around low-performing schools and students at scale. Poland achieved this through a major restructuring of its school system – essentially removing a secondary school track designed for students with lower performance expectations. In doing so, Poland eliminated the possibility for teachers and schools to turn away students from disadvantaged social backgrounds; they now had to face head-on the challenges of offering high-quality learning opportunities to all students. Germany achieved similar improvements but through a concerted, system-wide effort that specifically targeted the learning opportunities of disadvantaged students. Shanghai-China transfers strong professionals to weak schools to improve their performance. These examples offer valuable lessons at a time when the Obama administration is placing strong emphasis on turning around the United States' lowest-performing schools to better serve its disadvantaged students.

The development of education data systems, the fourth pillar of Race to the Top, is not a focus of this volume, because data systems are an area in which the United States leads the field.

The following draws together the threads of earlier analyses in this volume to present some of the broader lessons that can be drawn from examining the successful policies and practices of education systems that have shown consistently high outcomes in PISA or seen rapid improvements in their outcomes over the past decade. National and state education systems are very complex. The way they function is highly dependent on their interaction with other systems that are no less complex, and with cultural, political, social, and economic factors that have a direct bearing on the goals and effectiveness of education systems. The chapter will focus on those factors that the preceding chapters suggest are related to the successes of national and state education systems. The way these factors are addressed in the comparison countries were described in the country reports.

The lessons drawn in this chapter are intended to show how countries have achieved high performance across systems and schools. But what is meant by "superior performance"? PISA defines countries as high performing if almost all of their students are in high school at the appropriate age, average performance is high and the top quarter of performers



place among the countries whose top quarter are among the best performers in the world (with respect to their mastery of the kinds of complex knowledge and skills needed in advanced economies as well their ability to apply that knowledge and those skills to problems with which they are not familiar); student performance is only weakly related to their socio-economic background; and spending per pupil is not at the top of the league tables. Put another way, the volume defines superior performance as high participation, high quality, high equity and high efficiency.

As shown in Chapter 2, the performance of 15-year-olds in the United States places it around the middle of the OECD league tables in reading and science and below the average in mathematics. But as also shown, the distribution of student performance within the United States is large, with pockets of high performance but also a long tail of poorly performing students and schools. First of all, performance varies among states. On the PISA reading assessment, for example, public schools in the Northeast of the United States perform at 510 PISA score points – 17 score points above the OECD average (comparable with results from the Netherlands), followed by the Midwest with 500 score points (comparable with the performance of Poland), the West with 486 score points (comparable with the performance of Italy) and the South with 483 score points (comparable with the performance of Greece).

Performance varies even more between schools. Indeed, one reason why countries with acknowledged superior performance overall continue to send delegations to study education in the United States is that interesting, provocative, and possibly leading examples of education practice can always be found in the United States. Many observers report that some of the very best education institutions can be found in the United States, at every level from the elementary school to the research university.

There is another reason why people with a strong professional interest in education are often fascinated by the United States. There is a conviction among many top policy experts that the future belongs to the world's leaders in creativity and innovation – countries with environments able to create not just new businesses but completely new industries. Though the United States is challenged on this front by many nations, educators come to the United States from other countries to see how the United States educates for the high level of innovation demonstrated in the economy.

One might suppose that there is a single best way to organise a national or state education system to achieve world-class status. But the preceding chapters suggest otherwise. Furthermore, the introduction of this volume posits that nations tend to go through a progression of education development that loosely follows their trajectory of economic development. The education development progression is characterised by a movement from relatively low teacher quality to relatively high teacher quality; from a focus on low-level basic skills to a focus on complex high-level skills and creativity; from Tayloristic forms of work organisation to professional forms of work organisation; from primary accountability to superiors to primary accountability to one's professional colleagues, parents and the public; and from a belief that only some students can and need to achieve high learning standards to a conviction that all students need to meet such high standards. The objective of the preceding chapters is to provide a better understanding for how some countries have embraced this path more firmly and transformed more quickly.

Any exploration of the individual country trajectories towards high education performance must account for each country's unique history and economic evolution, recognising that countries hold different values, different assets and different liabilities in their education systems, and employ different strategies to gain world-class results. In more colloquial terms, "there is more than one way to skin a cat". These unique trajectories emerge through the case studies in this volume. But the processes of development and the ingredients of top performance are far from random. Common underlying principles of educational success are the focus of this chapter.

With respect to the United States, it is important to bear in mind that individual communities and states in the United States can be placed at many points along the development continuum, and the most effective system of education for one community or state may be very different from the one that is best suited to another, depending on where they are on that continuum. High-wage states, like high-wage countries, will need to reach and maintain high education performance as rapidly as possible to maintain and improve their standard of living in the long run. In the pages that follow, the focus is on comparing the United States to the best-performing countries, even if the United States may need to achieve high performance state by state and even if other countries may be more appropriately compared to individual states. For example, in size, population and demographics, a more appropriate comparison might be between Finland and Minnesota, Ontario and Massachusetts, or Poland and California rather than Finland and the United States or Poland and the United States.



Some contend that the value of educational comparisons for the United States is limited because the United States is unique among the family of nations. However, the analysis in Chapter 2 makes it clear that the United States is not unique, at least not demographically or socio-economically. In fact, the United States has many socio-economic advantages. As shown in Chapter 2, it is wealthier than any of the comparison countries and spends more money on education than any of them, its parents have a higher level of education than those in most countries, and the share of socio-economically disadvantaged students is around the OECD average. What the comparisons do show is that socio-economic disadvantage has a particularly strong impact on student performance in the United States: 17% of the variation in student performance in the United States is explained by students' socio-economic background. This contrasts with just 9% in Canada or Japan, two of the benchmark countries chosen for this study. In other words, in the United States two students from different socio-economic backgrounds vary much more in their learning outcomes than is typically the case in OECD countries: only Hungary, Belgium, Turkey, Luxembourg, Chile and Germany show a larger impact of socio-economic background on reading performance than the United States. The comparatively close dependency of the learning outcomes of students in the United States on socio-economic background is therefore *not* explained by a socio-economically more heterogeneous student population or society, but mainly because socio-economic disadvantage leads more directly to poor educational performance in the United States than is the case in many other countries. And yet, even if the relationship between socio-economic background and learning outcomes is strong, over 20% of American 15-year-olds enrolled in socio-economically disadvantaged schools reach the average performance standards of Finland, one of the best-performing education systems, and the same is true for some of the most disadvantaged American schools. This shows clearly that the challenges of disadvantage are not only successfully addressed in other countries but also by many individual students and schools in the United States.

Some educators in the United States have contended that other nations educate only their elites while they are responsible for educating everyone. That has not been true for decades. The PISA 2009 assessment shows 82% of 15-year-olds to be enrolled in the United States. Among the 34 OECD countries, that is the third lowest figure, after Mexico and Turkey. Similarly, some contend that the United States is unique in the proportion of minorities, immigrants and non-native language speakers in its student population. It is true that the proportion of such people is high but it is not true that the United States is alone in these respects. More important is that, as shown in Chapter 2, many countries with equal or higher proportions of immigrant students and non-native speakers of the local language are outperforming the United States and show a more moderate relationship between socio-economic background and learning outcomes.

Furthermore, most of the systems studied for this volume are the size of states in the United States. In larger federal systems, such as Canada, Germany and Brazil, the provinces and states have much the same degree of autonomy from the national government on education issues as do the individual states in the United States. In China, the municipalities of Shanghai and Hong Kong have significant autonomy. Thus all the jurisdictions that are the focus of this volume, with the exception of Germany and Japan, are the size of American states or are organised on the federal principle with states that have the same authority as American states. The lessons drawn from statistical comparisons and the in-depth country studies are those with which American states should be able to make improvements in student performance.

There is, of course, also the matter of culture. Some may dismiss the educational achievements of other countries on the grounds that the cultures of other countries are so different from that of the United States that the policies and practices of those countries could not possibly be adopted by the United States, or, if they were, would produce very different results. Indeed, culture can influence national student achievement results. Countries with cultures based on the Confucian tradition are recognised as placing a very high value on education and student achievement in school, and many observers believe that this cultural characteristic confers a large advantage on such countries. But the educational success of the countries with a Confucian tradition is relatively recent, and not all such countries show high levels of student performance. A Confucian heritage may be an asset but provides no guarantee of success. Furthermore, Finland and Canada also have cultures that place a very high value on education, showing that such shared beliefs are not unique to Confucian cultures. It is probably fair to say that, everything else being equal, countries that place a high value on education get better educational results than countries that do not. The extent to which educational aspirations of parents are the result of cultural values or determinants of these, and how such educational aspirations interact with educational policies and practices is an important subject that deserves further study.



So what is the lesson to be learned? If a country seeks better education performance, it is incumbent on the political and social leaders to persuade the citizens of that country to make the choices needed to show that it values education more than other areas of national interest. Culture is a matter of values, and some of the preceding chapters show how these values can change over time as a result of experience. If the United States does not place as high a value on education as those nations that get better education results, it is not likely to achieve the same level of education performance as those nations.

A century ago, when the United States was putting in place the education system that it has used ever since, it was eager to learn as much as possible from other nations as it designed its own system. It took the ideas of universal basic schooling and the modern research university from Germany. It borrowed the underpinnings of the world's best system of vocational and technical education from the Scots, who successfully developed the principles for Scotland's mechanics institutes, which were then among the world's high-technology leaders. And the design of America's leading private secondary schools was lifted whole from the model provided by England's leading "public" schools, such as Eaton and Harrow.

But this openness to borrowing ideas moderated afterwards. In the years following the Second World War, the United States alone had the resources to greatly expand its education system and soon topped all of the world's education league tables. Perhaps the United States assumed that once it was in the lead, it would always be in the lead. It was only over recent decades, when American educators began to hear that students in other countries outperformed the United States in many areas, that there has been renewed interest in internationally comparative analyses. Most recently,¹ Secretary Duncan devoted much of his address to OECD Education Ministers to the importance of international benchmarking and the collective benefits of global exchange and collaboration in the field of education.

LEARNING FROM HIGH-PERFORMING EDUCATION SYSTEMS


Developing a commitment to education and a conviction that all students can achieve at high levels

Many nations declare that they are committed to children and that education is important. The test comes when these commitments are weighed against others. How do they pay teachers compared to the way they pay others with the same level of education? How are education credentials weighed against other qualifications when people are being considered for jobs? Would you want your child to be a teacher? How much attention do the media pay to schools and schooling? When it comes down to it, which matters more, a community's standing in the sports leagues or its standing in the student academic achievement league tables? Are parents more likely to encourage their children to study longer and harder or to want them to spend more time with their friends or playing sports?

As shown in Chapter 2, in the countries with the highest performance, teachers are typically paid better relative to others, education credentials are valued more, and a higher share of educational spending is devoted to instructional services than is the case in the United States, where parents may not encourage their children to become school teachers if they think they have a chance of becoming attorneys, engineers, doctors or architects. The value placed on education is likely to influence the choices that students make about whether to study or head down to the ball field or hang out with their friends on the corner, and, later, whether the most capable students decide on school teaching, or something with higher social status, as a career. It has an effect on the willingness of the public to honour the views of professional educators or dismiss them.

Some will say that these are cultural matters and not amenable to change, but the preceding chapters suggest that in countries with little in the way of natural resources, such as Finland, Singapore and Japan, education appears to have a high status at least in part because the public at large has understood that the country must live by its wits and its wits depend on the quality of education. That is, the value that a country places on education depends in part on a country's view of how human capital fits into the way it makes its living. Placing a high value on education may be an underlying condition for building a world-class education system, and it may be that most countries that have not had to live by their wits in the past will not succeed unless their political leaders explain why, though they might not have had to live by their wits in the past, they must do so now.

But placing a high value on education will get a country only so far if the teachers, parents and citizens of that country believe that only some subset of the nation's children can or need to achieve high standards. This volume shows a distribution of attitudes on this point. Brazil inherited a situation in which the people who gained control of it when it was colonised assumed that the people they conquered and the people they enslaved had so little to



offer they were not worth educating. Germany is a country in which it was widely assumed until recently that the children of working-class people would themselves get working-class jobs and would not profit from the curriculum offered by the *Gymnasium*. PISA shows these attitudes to be mirrored in the perception of students about their own educational future. While in Germany only a quarter of 15-year-olds in PISA said that they expect to go on to university, fewer than those who actually will, in Japan and Korea, 9 out of 10 students said they expected to do so. The results of these differences can also be seen in the distribution of student performance within each of these countries and in the impact that socio-economic background has on learning.

Furthermore, the writings of some educational psychologists in the United States, from Terman on, have fostered a widespread notion that student achievement is mainly a product of inherited intelligence, not hard work. This is also mirrored in results from the Third International Mathematics and Science Study, where a significant share of American students reported that they needed good luck rather than hard work to do well in mathematics or science, a characteristic that was consistently negatively related to performance.² Teachers may feel guilty pressing students who they perceive to be less capable to achieve at higher levels because they think it unfair to the student to do so. Their goal is then likely to enable each student to achieve up to the mean of students in their classrooms rather than, as in Finland, Singapore or Shanghai-China, to achieve high universal standards. A comparison between school marks and performance of American students in PISA also suggests that teachers often expect less of students from lower socio-economic backgrounds even if the students show similar levels of achievement. And those students and their parents may expect less, too. This is a heavy burden for the American education system to bear, and it is unlikely that the United States will achieve performance parity with the best-performing countries until it, too, believes, or behaves as if it believes, that, with enough effort and support, all children can achieve at very high levels.

In contrast, in Finland, Japan, Singapore, Shanghai-China and Hong Kong-China, parents, teachers and the public at large tend to share the belief that all students are capable of achieving high standards and need to do so. This volume provides a wealth of instructive examples for how public policy can support the achievement of universal high standards. One of the most interesting patterns observed among some of the highest-performing countries was the gradual move, in many of them, from a system in which students were streamed into different types of secondary schools, with curricula set to very different levels of cognitive demand, to a system in which all students now go to secondary schools with curricula set to much the same high level of cognitive demand. Those countries did not accomplish this transition by taking the average of the previous levels of cognitive demand and setting the new standards to that level. Instead, they “levelled up”, requiring all students to meet the standards that they formerly expected only their elite students to meet. In these top-performing education systems, all students are now expected to perform at the levels formerly thought possible only for their elites.

Recognising that the road to dropping out of high schools starts early, Ontario created the “Student Success Initiative” in high schools. Rather than sending out a team from the ministry, they gave the districts money to hire a Student Success leader to co-ordinate efforts in their district. The ministry also gave money for the district leaders to meet and share strategies. Again, each high school was given support to hire a provincially-funded Student Success teacher and was required to create a Student Success team to track early indicators of academic struggles and design appropriate interventions.³ The outcomes of this work have changed Ontario’s system profoundly, and within a few years the high school graduation rate increased from 68% to 79%.

With a different institutional setup, Finland’s special teachers fulfil a similar role of early diagnosis and support, working closely with classroom teachers to identify students in need of extra help, and then working individually or in small groups with struggling students to provide the extra help and support they need to keep up with their classmates. It is not left solely to the discretion of the regular classroom teacher to identify a problem and alert the special teacher; every comprehensive school has a “pupils’ multi-professional care group” that meets at least twice a month for two hours, and which consists of the principal, the special teacher, the school nurse, the school psychologist, a social worker, and the teachers whose students are being discussed. The parents of any child being discussed are contacted prior to the meeting and are sometimes asked to be present.

Underpinning the entire Singaporean education system is the belief – for students of all ethnic backgrounds and all ranges of ability – that education is the route to advancement and that hard work and effort, not inherited intelligence, is the key to success in school. Singapore, too, had a system of streaming in its elementary schools that it later moderated as it raised its standards. And Singapore uses a wide range of strategies to make sure that student difficulties are diagnosed early and that students who are even just beginning to fall behind are immediately diagnosed properly and given whatever help is needed to get them back on track as quickly as possible. The success



of the government's economic and educational policies has brought about immense social mobility that has created a shared sense of national mission and made cultural support for education a near-universal value.

In all these education systems, universal high expectations are not a mantra but a reality and students who start to fall behind are identified quickly, their problem is promptly and accurately diagnosed and the appropriate course of action is quickly taken. Inevitably, this means that some students get more resources than others because the needs of some students are greater; but it is the students with the greatest needs who get the most resources, for that reason.

It has taken most countries time to get from a belief that only a few students can achieve to the point where most educators embrace the proposition that all can do so. It takes a concerted, multifaceted programme of policy-making, capacity-building and the development of proof points to get to the point at which most educators believe it can be done. But no education system included in this study has managed to achieve sustained high performance without developing a system that is premised, in detail, on the proposition that it is possible for all students to achieve at high levels and necessary that they do so. The importance of recent developments in American federal education policy to set the clear expectation that all students should be taught to the same standards and held to the same expectations cannot be overestimated. The No Child Left Behind Act of 2001 required all schools to make progress towards a state-determined standard of "proficiency" for all students, and the Obama administration has supported the states in their efforts to put in place more rigorous state standards linked to college and career readiness, with an increased focus on the instructional systems and teacher support necessary to ensure that all students are held and taught to these same expectations. The challenge ahead will be to back those expectations up with the kinds of student, parent and school support systems that characterise today's most advanced education systems.

Establishing ambitious, focused and coherent education standards that are shared across the system and aligned with high-stakes gateways and instructional systems

Fifteen-year-olds in the United States often rate themselves comparatively highly in academic performance in PISA, even if they did not do well comparatively. In part, that may be due to culture, but one interpretation is also that students are being commended for work that would not be acceptable in high-performing education systems. The results from PISA suggest that, across OECD countries, schools and countries where students work in a climate characterised by high performance expectations and the readiness to invest effort, good teacher-student relations, and high teacher morale tend to achieve better results.

One trend across countries over recent years has been for countries to articulate the expectations that societies have in relation to learning outcomes and to translate these expectations into educational goals and standards. All of the high-performing countries profiled in this volume have developed world-class academic standards for their students and their existence tends to be a consistent predictor for the overall performance of education systems. The approaches to standard-setting in OECD countries range from defining broad educational goals up to formulating concise performance expectations in well-defined subject areas. Whatever the approach, such standards shape high-performing education systems by establishing rigorous, focused and coherent content at all grade levels; reducing overlap in curricula across grades; reducing variation in implemented curricula across classrooms; facilitating co-ordination of various policy drivers, ranging from curricula to teacher training; and reducing inequity in curricula across socio-economic groups.

The establishment, by states, of "common core standards" in the United States follows a similar line of reasoning, with the potential to address the current problem of widely discrepant state standards and assessment cut scores that have led to non-comparable results. These non-comparable standards often mean that a school's fate depends more than anything else on in what state the school is located. More important, students across the United States are left on an unequal footing as to how well they are prepared to compete in the United States labour market.

As shown in Chapter 2, most countries have incorporated their standards into systems of high-quality curricula and external examinations at the secondary school level that are used to construct clear gateways for students either into the workforce and good jobs or to the next stage of education or both.⁴ The subjects included in these core instructional systems typically include the language of instruction, mathematics, physics, biology, chemistry, earth sciences, geography, world history, their own country's history, economics, art, music, foreign languages and, in the case of Finland, philosophy. The country report of Canada provides a good example of how such instructional systems can be established. While there is wide variation in the degree to which the curricula actually penetrate Canadian classroom practices, they do provide guidance as to what should be learned by which students at what ages.



It is noteworthy that every one of the high-performing education systems profiled in this volume is focused on the acquisition of complex, higher-order thinking skills and, in many, on the application of those skills to real-world problems. The re-organisation of traditional subjects into “learning domains”, as described in the report for Shanghai-China, provides a more recent example of such efforts.

For that reason, examinations in most of the countries described in this volume rely little, if at all, on multiple-choice computer-scored tests, which educators in these countries believe cannot properly measure higher-order thinking skills. Instead, they mostly use essay-type responses on their timed examinations and also factor into the grade the pieces of work that could not possibly be produced in a timed examination. Many nations also use oral examinations. In contrast, state assessments in the United States still predominantly consist of multiple-choice questions with limited cognitive and meta-cognitive demands. Two consortia, comprising 44 states, are seeking to address this issue by designing a new generation of assessments with federal funding. This holds significant promise for assessing a broader range of student skills and knowledge, even if it will take both time and persistence for such assessments to reach classrooms and students at scale. This is an area where the United States can draw on rich experience accumulated in other countries.

In some countries, when the exams are over, newspapers publish many of the exam questions, mostly those that prompt students to write short essays, and the ministry publishes examples of answers that earned top grades. In this way, students, parents and teachers all learn what is considered to be high-quality student work, and students can compare their own work to a clear example of work that meets the standard. The standard in such systems consists of the narrative statements of what students should know and be able to do, the questions asked in the exams, and the responses of the students who earned good grades on the exams.

Often these examinations are linked to national qualifications systems. In countries with systems of this sort, one cannot go on to the next phase of one’s education or begin a career in a particular field without a document showing that one is qualified to do so, according to a set of rules and standards laid down by the state. Everyone knows what is required to get a given qualification, in terms of both the content studied and the level of performance that has to be demonstrated to earn it. Countries using qualifications systems typically establish key gateways for students in their systems, one of the most important of which is a gateway that lies at the end of lower secondary education and the beginning of upper secondary education. In most of the countries studied, all students are expected to master a common curriculum by the age of 15 or 16. Then they pursue more individualised paths. Which opportunities are available to them is a function of the qualifications they have earned. Much the same thing happens at the end of upper secondary education, and in some countries the end-of-school examination determines access to university.

The idea of using examinations to create qualifications systems has often raised concerns in the United States, which takes pride in a system that offers second, third and fourth chances to students. Educators know that students are often not ready to make their mark when the system says they should be ready. Why should a student be forever denied an opportunity to succeed in such circumstances? If one is not a late-bloomer oneself, one certainly knows of someone who is. It seems both unfair and unwise to deny anyone such an opportunity. There is a finality about a qualifications system that seems threatening. Indeed, some qualifications systems are set up as screening and sorting systems, and those designed with that purpose can have exactly the effects identified above. However, even in the most exam-driven education systems in East Asia, there are considerable efforts underway to address these weaknesses while maintaining the strengths of the examination systems. As the chapter on Shanghai-China notes, public examinations are conceived as the baton that conducts the entire orchestra; and rather than discard the baton, the East Asian countries are trying to change it so that it conducts good music.

Perhaps more important, examination systems do not have to be set up that way. In Sweden, and a number of other northern European countries, the qualifications systems are established so that it is never too late to earn a given qualification. In such systems, it cannot be said that one has failed the exams, but only that one has not yet succeeded on them. Perhaps it is not a coincidence that Sweden is also the OECD country with the highest incidence and intensity of adult learning in both formal and non-formal education, and the country with the highest level of adult literacy and numeracy skills too. Contrast this with the American high school diploma. In most states, if one has not gotten one’s high school diploma by the early 20’s, one can never get it, and the best that one can do is to get a GED, which is widely regarded as inferior to a high school diploma. In Sweden and most of the northern European countries, one can get the equivalent of the American high school diploma in any adult education centre and, because the exam is exactly the same, everyone views the 45-year-old who just got her high school diploma as having met a standard every bit as high as the student who got one at the normal age just leaving Folkeschule.



In such systems, where it is never too late to get any qualification, the advantage of having a qualification system is that the examinations are always available and the standards are never lowered or waived. Students know that they have to take tough courses and study hard in order to get the qualification and so they do. One does not get to go on to the next stage simply because one has put in the requisite time. One gets to move on only if one has met the requisite performance standards. This is a system with very high stakes for the students. There are typically low or no stakes for the teachers in these systems. The result is a higher standard of education across the whole society than is the case in a society that is forever waiving the standards to give students second chances. It is true that high-stakes examination systems can lead to a focus on test preparation at the expense of real learning, the development of large private tutoring industries that tend to favour the wealthy, and incentives for cheating. These dangers are real and reflected in some of the country reports; but as most of the countries featured in this volume suggest, these dangers can be mitigated.

Because the examinations are typically externally graded, the teacher, student and parents feel that they are all on the same side, working towards the same end, and one does not see a situation where parents go to the school administration to change the student's grade, pitting the teacher, who wants to preserve some standard, against parents, who want the best possible future for their children. Parents and students know that neither the teacher nor the administration can change the grade, and therefore the only way to improve the outcome for the student is for the student to work harder and do better work. In many of those countries, training for teachers is focused on enabling them to teach those required courses to their students well.

In the countries that use these systems, the best minds in the country determine what topics will be taught in what sequence through the grades. In some of the countries profiled in this volume, the officials responsible for specifying the curriculum framework also play an important part in supervising the writing of textbooks. The result is a powerful, coherent system of instruction that is available to all students.

Again, the adoption of the Common Core Standards by the states and the work of the state consortia funded by Race to the Top open important opportunities for the United States to make real progress on this set of challenges. But to have a sustained impact on learning outcomes, further steps need to include developing world-class standards for all the subjects in the core curriculum; creating well-thought-out curriculum frameworks for those subjects that can guide the work of teachers and publishers of instructional materials; developing examinations focused on complex thinking skills, to assess whether students have met the standards across the core curriculum; and creating a system of gateways using the new examinations that constitute a well-developed qualifications system.

Developing more capacity at the point of delivery

The quality of an education system cannot exceed the quality of its teachers and principals. Corporations, professional partnerships, national militaries and national governments know that they have to pay attention to how the pool is established from which they recruit; how they recruit; how they select their staff; the kind of initial training their recruits get before they present themselves for employment; how they mentor new recruits and induct them into their service; what kind of continuing training they get; how their compensation is structured; how they reward their best performers and how they either improve the performance of those who are struggling or get rid of them; and how they provide opportunities for the best performers to acquire more status and responsibility.

Attracting high-quality teachers

With respect to the pool from which an industry or an organisation recruits its professionals, the aim generally is to do whatever is possible to generate a pool that comes from the highest-performing segment. Most firms and industries rely heavily on elementary, secondary and post-secondary institutions to do that sorting for them. That is what the top Japanese ministries are doing when they decide to recruit from the University of Tokyo and what the top Wall Street law firms are doing when they recruit mainly from among Harvard, Yale and Stanford graduates. They are more interested in these institutions because they believe they are good at getting the very best in terms of what the Japanese call "applied intelligence" than because of the specific knowledge and skills they are buying.

Because no industry can afford to source all of its professionals from the highest-performing segment, they structure their operations so that they can put the best of the best in key positions and use others who may not be quite as good in supporting positions. More often than not, they use pyramidal structures which both permit them to make the most of their best professionals and put those with lower performance in supporting positions.



So what determines the pool from which an entire industry can select its professionals? It varies, but the country reports suggest that it includes some combination of the social status associated with the occupation and work, the sense of personal contribution one can make, and the financial rewards one can expect. In some countries, the status of the teaching profession has changed significantly. Earlier chapters have shown how Finland raised the social status of its teachers to a level where there are few occupations that have higher social status than teaching. Finnish teachers have earned the trust of parents and the wider society by their demonstrated capacity to use professional discretion and judgement in the way they manage their classrooms and respond to the challenge of helping virtually all students become successful learners. In 2010, over 6 600 applicants competed for 660 available slots in primary school preparation programmes in the eight universities that educate teachers.⁵ While teachers in Finland have always enjoyed respect in society, a combination of raising the bar for entry into the profession and granting teachers greater autonomy and control over their classrooms and working conditions than their peers enjoy elsewhere has helped to raise the status of the profession and make teaching one of the most desirable career choices among young Finns. Consequently, teaching is now a highly selective occupation in Finland, with highly-skilled, well-trained teachers spread throughout the country. Also, in the traditionally Confucian cultures, teachers have long had higher social status than is generally true in the West. In some of the East Asian countries, teachers' compensation is fixed by law to make sure that teachers are among the highest paid of all positions in the civil service.

By raising the bar to enter the teaching profession, these systems discourage young people with poor qualifications from entering teaching and attract people with high qualifications. Capable young people who could go into high-status occupations are not likely to enter an occupation that the society perceives as easy to get into and therefore likely to attract people who could not get into more demanding occupations.

The report on Shanghai-China shows the degree of change that is possible in that realm, as does the note about the English initiative to recruit teachers. As that note points out, the Blair administration faced one of the worst shortages of teachers in British history when it took office. Five years later, there were eight applicants for every opening. To some extent this had to do with raising compensation significantly, as well as with important changes in the work environment for teachers; but a sophisticated and powerful recruiting programme played a very important part in the turnaround. Singapore is notable for its own approach to improving the quality of the pool from which it selects candidates for training. Singapore carefully selects young people who the government is especially interested in attracting to teaching and offers them a monthly stipend while in training that is competitive with the monthly salary for fresh graduates in other fields. In exchange, these teachers-in-training must commit to teaching for at least three years. Singapore also keeps a close watch on occupational starting salaries and adjusts the salaries for new teachers. In effect, the country wants its most qualified candidates to regard teaching as just as attractive in compensation as other professions.

Generally, in the United States, teaching has been seen as a very attractive occupation for people whose parents had little education and may be the first members of their family to get a college education and leave the working class for the middle class. As more and more people in the United States have gone to college, however, the relative status of teachers seems to have declined, and schools of education are usually not regarded as highly as other professional schools. OECD data show that teachers' pay in the United States is fourth from the bottom among OECD countries, when teachers' compensation is compared to that for other occupations requiring the same amount of education.⁶ Perhaps most important, when students who are deciding what careers to pursue look at teaching, they may see an occupation that looks more like a blue-collar occupation than a knowledge-based profession. All these things severely restrict the pool from which Americans select their teachers, relative to other countries.

Drawing on lessons from Britain's successful efforts to improve the occupational prestige of the teaching profession, the Obama administration has recently announced plans to attract high-calibre candidates into teaching and raise the prestige of the profession in the United States.

Preparing high-quality teachers

At the same time, the recruitment of top-performing graduates can only be one of several components of human resource management in education. The report of Ontario provides a compelling case for how a successful reform trajectory began not by waiting for a new generation of teachers, but by investing in the existing schools and teachers, wherever they stood, enlisting their commitment to reform and supporting their improvement. This involved extensive capacity-building in schools as well as in the system, and quarterly meetings between the system leaders and the major teachers' unions, superintendents' organisations, and principals' associations to discuss ongoing reform strategies.⁷



There is an instructive pattern here among the top-performing countries. Many of the countries studied in this volume have moved from a system in which teachers are recruited into a larger number of specialised, low-status colleges of teacher education, with relatively low entrance standards, into a relatively smaller number of university-based teacher-education colleges with relatively high entrance standards and relatively high status in the university. Finland is the archetypal case, but Singapore, Shanghai-China and Germany provide other examples. It would appear that countries interested in raising the quality of their teaching force understand that they cannot accomplish that goal without raising the standards for entrance into their schools of education, if only because the candidates they are trying to attract may not be interested in attending a professional school that has low status in the higher-education system and in society at large.

Apart from raising entrance standards to make them comparable to those of other professions, teacher-education programmes in the top-performing countries studied show some further common characteristics:

- Across the board, the best-performing countries are working to move their initial teacher-education programmes towards a model based less on preparing academics and more on preparing professionals in clinical settings, in which they get into schools earlier, spend more time there and get more and better support in the process. In Finland, this includes both extensive course work on how to teach – with a strong emphasis on using research based on state-of-the-art practice – and at least a full year of clinical experience in a school associated with the university. These model schools are intended to develop and pilot innovative practices, and foster research on learning and teaching.
- They put more emphasis on developing the capacity of teachers in training to diagnose student problems swiftly and accurately.
- They are working to develop the prospective teacher's capacity to draw from a wide repertoire of possible solutions those that are particularly appropriate to the diagnosis.
- They put more emphasis on the specific instructional techniques that are appropriate for the subjects that the prospective teacher will teach. Because teacher education in Finland is a shared responsibility between the teacher-education faculty and the academic-subject faculty, there is substantial attention to subject-specific pedagogy for prospective teachers.
- Some countries, notably Shanghai-China and Finland, provide teachers with the research skills needed to enable them to improve their practice in a highly disciplined way. In Finland, teachers are encouraged to contribute to the knowledge base on effective teaching practices throughout their career, with candidates not only expected to become familiar with the knowledge base in education and human development, but also required to write a research-based thesis as the final requirement for the Masters degree. The Chinese, too, emphasise giving prospective teachers the skills they will need for action research, and their method for improving their education system over time relies on research performed by teachers. China is also able to enlist teachers trained in this way as leaders of efforts organised by their ministries to systematically introduce and try out new ideas for improving their education systems.
- Part of the motivation for relocating teacher-education programmes to the university has been to make sure that the preparation of teachers in the subjects they will teach is comparable to that of people who will go on to be professionals in other arenas. In most of these countries, people who are going on to be elementary or primary school teachers are required to declare whether they will specialise in either mathematics and science or their native language and social studies, and they are required to attain a high level of substantive knowledge in the speciality they will teach.

These developments are hardly surprising. Given that these countries are pursuing a school structure in which all students are expected to perform at elite levels and teachers are expected to make sure that (literally) no students will be allowed to fall behind, it becomes essential that teachers identify students who are just beginning to fall behind, diagnose the problem, and have the skills and knowledge needed to create a large and constantly updated reservoir of solutions to the student performance problems they have diagnosed.

Development of teacher quality once teachers are in the work force

The country reports on Germany and Japan show how, once teachers have completed their pre-service training and begun their teaching, they enter with one or two years of heavily supervised teaching. During this period, the beginning teacher typically receives a reduced workload, strong mentoring by master teachers, and continued formal instruction.



Also, the top-performing countries in East Asia profiled in this volume have ways to make the most of their top-performing teachers that are instructive in the context of the United States. At the school level, the best teachers in these countries typically lead the process of lesson development. The master teachers are also called upon to coach beginning teachers and to play a key role in analysing the problems of students who are having difficulties with learning. The district and provincial offices of education often identify the best of the teachers who emerge from this process and relieve them of some or all of their teaching duties so that they can give lectures to their peers, provide demonstrations, and coach other teachers on a district, provincial and even national scale. Carefully picked schools are often asked to pilot new programmes or policies before they are scaled-up and the best teachers in those schools are enlisted as co-researchers to evaluate the effectiveness of the new practices. Because the initial preparation of teachers in those countries includes instruction in research skills, it is expected that teachers will use those skills to generate evidence to improve their practice in a disciplined way. Research is an integral part of what it means to be a professional teacher in those countries.

The policies and practices just described have implications for many aspects of system performance. But one important group of consequences has to do with the quality of the teacher workforce itself. The tradition of lesson study in East Asia means that Asian teachers are not alone. They work together in a disciplined way to improve the quality of the lessons they teach. That means that teachers whose practice lags behind that of the leaders can see what good practice is. Because their colleagues know whom the poor performers are and discuss it, the poor performers have both the incentive and the means to improve their performance. Because the structure of the East Asian teaching work force includes opportunities to become a master teacher and to move up a ladder of increasing prestige and responsibility, it also pays the good teacher to become even better.

There are other measures that top-performing countries use to maintain high quality in their teacher work force. In Shanghai-China, each teacher is expected to engage in 240 hours of professional development within five years. Singapore provides an entitlement of 100 hours of professional development per year to teachers to keep up with the rapid changes occurring in the world and to be able to improve their practice. And Singapore, like other countries, is improving its performance-appraisal system, making sure that each teacher is appraised by a whole group of people every year against 16 different competencies.⁸ Teachers who do outstanding work receive a bonus from the school's bonus pool.

Teacher quality and teachers' unions

As PISA shows, in most OECD countries, once teachers are hired, it is very hard to remove them from professional service, irrespective of the quality of their work. The high quality of teachers in those countries appears to be a function of the policies that determine the pool from which teachers are initially drawn, their compensation, the status of teachers, the high standards of entering university-level teacher-preparation programmes, the quality of their initial preparation, and the attention given to the quality of their preparation following their initial induction.

Critics of American education are sometimes disapproving of the teachers' unions and of how they perceive these unions as interfering with promising school reform programmes by giving higher priority to the unions' "bread and butter" issues than to what the evidence suggests students need to succeed. But the fact is that many of the countries with the strongest student performance also have the strongest teachers' unions, beginning with Japan and Finland. There seems to be no relationship between the presence of unions, including and especially teachers' unions, and student performance. But there may be a relationship between the degree to which the work of teaching has been professionalised and student performance. Indeed, the higher a country is on the world's education league tables, the more likely that country is working constructively with its unions and treating its teachers as trusted professional partners. Witness the reports of Ontario in Canada or Finland.

The report on Canada, in particular, describes how issues of collective bargaining can be successfully separated from professional issues, where teachers and their organisations collaborate effectively with ministry staff in self-governing bodies to oversee issues of entry, discipline, and the professional development of teachers. Central to success in this area in Ontario was the signing of a four-year collective bargaining agreement with the four major teachers' unions. In reaching the accord, the ministry was able to negotiate items that were consistent with both its educational strategy and the unions' interests, thus providing a basis for pushing forward the education agenda while creating a sustained period of labour peace that allowed for continued focus on educational improvement. That was facilitated because union agreements could be reached at the provincial level, which may be more challenging in the context of the United States, with the more decentralised nature of union-management decision-making.



Unless the United States raises the professional status of its existing teaching force as Ontario has done, upgrades the pool from which it selects new teachers, is more selective in admitting candidates for initial teacher training and education, greatly improves the quality of, and includes much more clinical education in, that training, changes the amount and structure of teachers compensation, finds practical and effective ways of raising the status of teachers, greatly improves the process of initial induction and restructures the occupation to provide increased and appropriate responsibilities for the best teachers, and leverages more effective union-management relations at local and state levels, it is unlikely to match the performance of the best-performing countries.

Important beginnings in this direction are under way. For example, the United States has directed new federal funding for teacher preparation towards more clinical programmes such as teacher “residency” programmes, in which teacher candidates learn to teach in schools under the guidance of experienced teachers while taking classes outside of teaching hours. The Obama administration has also sought, through the Race to the Top programme and other efforts, to encourage states and districts to develop more rigorous systems of teacher evaluation that can inform new approaches to induction, compensation and career advancement decisions. These efforts are consistent with the approaches in the high-performing systems profiled in this volume.

Developing capable school leaders

In most countries researched for this volume, high schools are generally smaller than the typical school in the United States, and the people responsible for leading school faculties are head teachers who spend some of their time teaching, rather than full-time administrators, as is the common practice in the United States. Head teachers are often chosen for their instructional leadership rather than their administrative capacity. Such a leadership system appears to provide a supportive framework for professional accountability in which teachers feel more accountable to one another for their performance, unlike the United States form of administrative accountability, in which teachers are made accountable to the principal and others in supervisory positions.

Singapore’s approach to leadership is exemplary in this respect and modelled on that found in large corporations, where the key is not just the training programme, but the whole approach to identifying and developing talent. This differs from the United States where, for example, a teacher can apply to train as a principal or school head, and then apply for a position in a school. In Singapore, young teachers are continuously assessed for their leadership potential and given opportunities to demonstrate and learn by, for example, serving on committees, then being promoted to head of department at a relatively young age. Some are transferred to the ministry for a period. After these experiences are monitored, potential principals are selected for interviews and go through situational leadership exercises. If they pass these, then they go to the National Institute for Education, the country’s sole teacher-training institution, for six months of executive leadership training, with their salaries paid. The process is comprehensive and intensive and includes an international study trip and a project on school innovation.

More generally, countries are paying increasing attention to redefining school leadership roles to drive improvements in learning outcomes and to manage increased school autonomy and accountability. This comes at a time when greater decentralisation in many countries is being coupled with more school autonomy, more accountability for school and student results, better use of the knowledge base of education and pedagogical processes, and broader responsibility for supporting the schools’ local communities, other schools and other public services. OECD’s comparative review of school leadership roles⁹ identified four groups of interrelated leadership responsibilities as central for improving schooling outcomes:

- First, a focus on supporting, evaluating and developing teacher quality as the core of effective leadership. Leadership responsibilities associated with improved teacher quality include recruiting high-quality teachers, providing a strong induction programme for new teachers, making sure the teachers have the skills and knowledge needed to teach the curriculum the school uses, organising the teachers to work together to improve the quality of teaching and instruction, monitoring and evaluating teacher practice, promoting teacher professional development, and supporting collaborative work cultures.
- Second, establishing learning objectives and implementing thoughtful assessments to help students reach high standards. Aligning instruction with central standards, setting school goals for student performance, measuring progress against those goals, and making adjustments in the school programme to improve individual and overall performance are the dynamic aspects of managing curricula and instruction. School leaders’ purposeful use of data is essential to ensure that attention is being paid to the progress of every student.

- Third, the strategic use of resources and their alignment with pedagogical purposes to focus all operational activities within the school on the objective of improving teaching and learning.
- Fourth, leadership engagements beyond the school, in partnerships with other schools, communities, social agencies and universities to foster greater cohesion among all those concerned with the achievement and well-being of every child.

Providing a work organisation in which teachers can use their potential: Management, accountability and knowledge management

Earlier in this chapter, a distinction was made between the Tayloristic management paradigm and the kinds of paradigms more suited to managing professionals or “knowledge workers”. In the former, one typically sees bureaucratic “command and control” systems, leaving little discretion to the workers and supervisors at the factory floor or service-delivery level of the organisation. In the latter, the people responsible for actually making the product or delivering the services have much more control of the way resources are used, people are deployed, the work is organised and the way in which the work gets done.

Many of the best-performing countries have had education systems far more centralised, bureaucratic and controlling than the United States has ever had, but most of those countries have rebalanced their systems to provide more discretion to school heads and school faculties, a factor that Chapter 2 shows, when combined with accountability systems, to be closely related to school performance. In many cases, these countries concluded that top-down initiatives were insufficient to achieve deep and lasting changes in practice, because reforms were focused on things that were too distant from the instructional core of teaching and learning; because reforms assumed that teachers would know how to do things they actually didn’t know how to do; because too many conflicting reforms asked teachers to do too many things simultaneously; or because teachers and schools did not buy in to the reform strategy. The chapters on Finland and Ontario provide examples of how formerly centralised systems have shifted emphasis towards improving the act of teaching; giving careful and detailed attention to implementation, along with opportunities for teachers to practice new ideas and learn from their colleagues; developing an integrated strategy and set of expectations for both teachers and students; and securing support from teachers for the reforms. This is also the direction towards which Japan and other Asian countries are moving. In some countries, great discretion is given to the faculty, as a whole, and its individual members. In others, more discretion is given to schools that are doing well and less to those that might be struggling. In some countries, the school head is little more than the lead teacher. In others, the authorities continue to look to the school head to set the direction and manage the faculty. But the common element is the degree to which they are all creating forms of work organisation that are moving from Tayloristic, bureaucratic management to the kinds of professional forms of work organisation more likely to be found in professional partnerships than in mass-production industrial operations.

The Finnish system of accountability is entirely built from the bottom up. Teacher candidates are selected in part based on their capacity to convey their belief in the core mission of public education in Finland, which is deeply humanistic as well as civic and economic. The preparation they receive is designed to build a powerful sense of individual responsibility for the learning and well-being of all the students in their care. The next level of accountability rests with the school. Again, the level of trust that the larger community extends to its schools seems to engender a strong sense of collective responsibility for the success of every student. While every comprehensive school in Finland reports to a municipal authority, authorities vary widely in the quality and degree of oversight that they provide. They are responsible for hiring the principal, typically on a six- or seven-year contract, but the day-to-day responsibility for managing the schools is left to the professionals, as is the responsibility for assuring student progress.

One might assume that schools in the United States, with its tradition of local control, have more autonomy than schools in other countries. But that is not the case, because American schools, at least in the cities and most suburbs, get much more direction from the local district central office than is typically the case in other countries. In that sense, the United States may have traded one form of centralised bureaucracy for another. It is also true that the more recent unionisation of American education, given the American style of union-management relations and the pressure to have contracts mirror neighbouring localities, may produce a more rule-bound environment than will be found in systems embracing more professional forms of work organisation.

So here, as elsewhere, the devil is in the details. The United States may appear to have a more devolved management system than those typically found in many high-performing countries, but, because of the way school-district management typically works, especially in middle-sized and larger districts, it will have to make major changes in



that system to match the flexibility of those used by the highest-performing countries. What is important here is that a truly professional staff has both the responsibility and the authority to design, manage, budget for and organise the school's programme in its entirety, within the framework provided by the goals, curricula, examinations and qualifications systems put in place by the state.

To some extent, the “charter” public school model in the United States, which has grown into wide use over the past 20 years, offers a model to address some of these issues and, in particular, for school heads and faculty to take on greater autonomy from the district over decisions around the school's instructional programme. However, these schools may have to accept greater accountability for improved student achievement outcomes. What is striking about the high-performing countries portrayed in this volume is that they provide not just some of their schools, but all of their schools, with the scope for school-based decision-making that is characteristic of charter schools in the United States. These schools are considered to be regular public schools and they are expected to implement the state curriculum, administer the state tests, produce the same public data on their performance, have the same budget resources, be accountable to the public and their own community, and take in all students just like any other schools are expected to do. In this sense, in many of these countries, all public schools are charter schools and all charter schools are public schools.

Many charter schools in the United States have significantly outperformed traditional public schools, especially among disadvantaged students, but the performance of many charter schools is similar to or worse than that of traditional public schools. The Obama administration has encouraged states to allow for such autonomous school models matched with stronger accountability for performance, and has provided additional funding targeted at high-performing public charter schools.

Institutionalising improved instructional practice

The country reports made the point that, in many Asian countries, classes are much larger than in the United States and teachers typically use whole-group instruction through the entire class period. They also pointed out that, in these countries, one sees little lecturing by the teacher. Instead, the teacher gives real-world problems to the whole class and, having observed the students attempting to solve those problems, asks several to come to the blackboard to talk about their approaches to the problem, knowing that some of those students have made errors in the strategy they have selected for solving the problem. As described in the country reports for Japan and Shanghai-China, the teacher uses these differences in strategy to develop a class discussion that focuses on the underlying concepts involved in problem-solving, and thereby promotes a deep understanding of the topic under discussion among both the quickest and the slowest students in the class. Nothing could so vividly demonstrate the point that instructional practice matters.

In this way, Japanese teachers maximise their contact time with each student in the class. Students are not whiling away their time when the teacher is dealing with a small group in the classroom. Students who misunderstand some important point in mathematics will find that they can identify with a student who is at the blackboard and has made a similar mistake and can, in effect, get individual attention without monopolising the teacher's time. Asian teachers often complain about class sizes getting too small to find a useful range of student solutions to a problem in order to conduct a good class, instead of complaining that the class is too large to teach effectively, as in the United States.

The Finnish education system pursues very similar goals but with different strategies. It applies a learner-centred approach that places considerable emphasis on student self-assessment, in which students are expected to take an active role in designing their own learning activities and work collaboratively in teams on projects that cut across traditional subject or disciplinary areas. By the time students enrol in upper secondary school (grades 10-12), they are expected to be able to take sufficient charge of their own learning to be able to design their own individual programme where, without a grade structure, each student proceeds at his or her own pace within the modular design of the system.

Similarly, the inquiry-based curriculum component in Shanghai-China asks students, with support and guidance from teachers, to identify research topics based on their experiences, seeking to develop the capacity of students to learn to learn, think creatively and critically, participate in social life, and promote social welfare. In fact, one very significant change implemented in Shanghai-China through the slogan “return class time to students” was the increase in student activities in classes relative to teachers' lecturing. This has caused a fundamental change in the perception of a good class, which was once typified by good teaching, with well-designed presentations by the



teachers. Videos of model teaching used to concentrate on teachers' activities. Now, model classes are filmed with two cameras, one of which records student activities. Teachers' performances are now also evaluated by the time given to student participation and how well student activities are organised.

These are all matters of instructional practice. In the United States, educators often consider these to be entirely in the purview of the individual teacher in the sanctuary of his or her classroom. This volume shows that, in countries as different as Finland, Japan or Shanghai-China, the practice of individual teachers is open to inspection by the other teachers in the school, and the quality of teachers' practice is seen as a matter for all the teachers in the school to be concerned about.

Teachers work together to produce lessons that are superior in their power to engage students in the work and convey the knowledge and skills specified in the syllabus. Because teachers work together on this, no teacher's classroom is private. It is not uncommon in Asian classrooms for teachers to occupy the last rows in a classroom as they observe the practice of a teacher they particularly admire. As was noted above in another context, in this kind of setting, there is no mystery about which teachers are most capable. Those who are less capable are under considerable pressure from their colleagues to improve their practice, and they have plenty of opportunities to do so, simply by observing their most capable colleagues and participating in the critiques of their practice, especially on the new lessons they are creating.

Finland has incorporated a similar approach in its teacher-development programmes. Student teachers regularly participate in problem-solving groups, a common feature in Finnish schools. The problem-solving groups engage in a cycle of planning, action and reflection/evaluation that is reinforced throughout the teacher-education programme and is, in fact, a model for what teachers will plan for their own students, who are expected to use similar kinds of research and inquiry in their own studies. In a way, the entire Finnish system is intended to improve through continual reflection, evaluation and problem-solving, at the level of the classroom, school, municipality and nation.

Some may contend that teaching is not a true profession because the craft of teaching is an individual matter, and there are no shared standards of practice, a hallmark of true professions. But the countries profiled in this volume generally consider teaching a profession where teachers work together to frame what they believe good practice to be, conduct field-based research to confirm or disprove the approaches they develop, and then judge their colleagues by the degree to which they use practices proven effective in their classrooms. This amounts to the collective search for ever more effective practices of the sort seen in Canada, Finland, Japan, Shanghai-China and Singapore. In this way, standards of practice can emerge and the effectiveness of practice can be steadily improved over time. This may be how a profession of teaching emerges. As pointed out above, in the East Asian countries studied here, as well as in Canada and Finland's teacher-training schools, those teachers who exhibit the very best practice are released, full-time or part-time, from their regular classroom duties to mentor new teachers, provide demonstrations to teachers in their own schools and other schools, and lecture to education audiences in their province or even nationally. They conduct their own research and university researchers examine their practice. In this way, classroom teachers codify and continually advance the standards for acceptable teaching practice.

In most of the countries studied in this volume, the way teachers work may be compared with the way physicians think about the practice of medicine. Doctors would not think of developing their own drugs; nor would they think of themselves as professionals if they did not carefully study the most effective procedures yet developed to deal with the presenting symptoms. Indeed, their sense of themselves as professionals comes in large measure from their deep knowledge of a wide range of presenting symptoms, their capacity to successfully diagnose a patient with those symptoms, and their capacity to identify and execute the most effective procedures available for the treatment of the diagnosed problem. It is much the same with the teachers in the schools of the countries with the most effective education systems. It is their capacity to diagnose individual students to identify the difficulties they are having, their encyclopaedic repertoire of effective solutions to the problems in student learning they encounter, their capacity to execute a lesson with such panache and skill that the students find it enthralling and totally engaging, and their devotion to the improvement of their craft that makes them professionals.

One must remember that all of this is going on in countries in which the standards for what students are meant to know and be able to do are much clearer than is typically the case in the United States. While teachers often tend to think of themselves as professionals to the extent that they have the freedom to choose what they will teach, as well as how they teach it, in the highest-performing countries, teachers have a great deal of freedom with respect to how they teach, but less with respect to what students are expected to know and be able to do. In the United States,



the initiative to establish common standards among the states will offer an opportunity to establish greater clarity about what teachers should teach, while continuing to allow them flexibility in how to design and deliver instruction in the classroom. But institutionalising high-quality instructional practice of the sort observed in high-performing systems, consistently and at scale, will remain a formidable challenge.

Aligning incentive structures and engaging stakeholders

To understand why people do the things they do, ask yourself what sort of incentives they have to act that way. Examining whether the incentives that operate on students, parents, teachers and others in those countries are more likely to produce higher performance than the incentives that operate on those actors in other countries can provide important insights into why some countries rank higher on the education league tables than others.

In countries with high-stakes examination systems, that is, systems in which students cannot go on to the next stage of their life – be it work or further education – unless they show that they are qualified to do so, students know what they have to do to realise their dream and they put in the work that is needed to do it.

As pointed out above, in the United States, high school students may be led to believe that the outcome is the same whether they take easy courses and get Ds in them or take tough courses and get As. Either way, they might think, they can get into the local community college and get on with their lives. Contrast this with a student of the same age in Toyota City, Japan, who wants to work on the line at a Toyota plant. That student knows that she must get good grades in tough subjects and earn the recommendation of her principal, so she takes those tough courses and works hard in school. The same is true of the student in Germany who wants to work for Daimler Benz in their machine shop or the student in Singapore who wants to go to work in the factory automation shop a few blocks from his home. The reason examination systems matter is that they provide strong incentives for students to take tough courses and study hard. One of the most striking features of the American education system, in contrast with the education systems of the most successful countries, is its failure to provide strong incentives to the average student to work hard in school. If the reader does not, for whatever reason, like the idea of examination systems, then the lesson learned here should be that some other means, no less effective, should be found to motivate students to work as hard in school as students in other countries do.

Similarly, if teachers do not work as hard at their job as teachers in other countries do, they are not likely to get the same results. The question is what incentives are most likely to produce that result. In Tayloristic work environments, the answer is that management should measure output carefully and then provide rewards to those whose measured output exceeds expectations. In those environments, workers are competing with one another, and most workers, resenting the worker who outperforms them, create social norms in which the outstanding performer is an outcast in the group. But in professional work environments, such as professional partnerships, the success of the whole group depends on maximising the output of each worker, so workers tend to collaborate to increase output, workers support getting rid of workers who pull the performance of the group down, and they approve of paying more to those who, by their effort or skill, increase the rewards coming to the group as a whole.

The learning environment is also shaped by parents in important ways. Parents who are interested in their children's education are more likely to support their school's efforts and participate in school activities, thus adding to available resources. As discussed in Chapter 2, PISA shows that school principals' perceptions of parents' constant pressure to adopt high academic standards and to raise student achievement tends to be positively related to higher school performance in 19 OECD countries, although that relationship is not apparent in the United States. PISA also shows that the socio-economic background of students and schools and key features of the learning environment are closely interrelated, and that both link to performance in important ways. This may be because students from socio-economically advantaged backgrounds bring with them a higher level of discipline and more positive perceptions of school values, or because parental expectations of good classroom discipline and strong teacher commitment are higher in schools with advantaged socio-economic intake. Conversely, disadvantaged schools may experience less parental pressure to reinforce effective disciplinary practices or ensure that absent or unmotivated teachers are replaced. In summary, students perform better in schools with a stronger school climate, partly because such schools tend to have more students from advantaged backgrounds who generally perform well, partly because the favourable socio-economic characteristics of students reinforce the favourable climate, and partly for reasons unrelated to socio-economic variables.¹⁰



There are significant differences in the way education systems involve parents in different countries. As pointed out above, in many countries in both Europe and Asia, certain teachers are designated as either homeroom teachers or classroom teachers. These teachers follow the student through a number of grades. They assume a certain holistic responsibility for the students in their class and form a close relationship not only with the student but with that student's parents. In both Asia and Europe, it is typical in such cases that a notebook is passed back and forth between the teacher and the parents, in which each party shares information about the student with the other party. These relationships lead to a kind of parent involvement in the education of their children that is rare in the United States, as well as to a spirit of collaboration between teacher and parents that is also unusual.

The idea of the "classroom teacher" has often been described as a cultural artefact that could not be imported into the United States at scale because there is no cultural history that would support it. But, in fact, it is a notion that has been adopted in countries with cultures as diverse as those in Asia and Europe. This particular policy has indeed been adopted by individual schools and some districts in a limited way in the United States, but not as a matter of state policy.

It is not just a way to involve parents but, perhaps even more important, it is a way to provide strong accountability to parents in a form that seems appropriate to teachers. Parents in systems that have adopted the idea of classroom teachers as universal policy tend to feel a strong bond with their children's classroom teachers. In a series of focus groups conducted in Denmark by the National Center on Education and the Economy, parents were asked what happens when their children gets a less competent classroom teacher and has to put up with that teacher for years. Was that not a problem? But parents said that the advantages of the system far outweighed any disadvantages that might come in the way suggested and reported that the classroom teacher system was one of the most important and most successful educational policies in their country.

There is another, rather subtle, advantage of this system. A teacher who teaches a given student for only one year typically feels that, while they will do the best they can with the students they get, there is little they can do in one year to correct the problems they have inherited from the poor practice of teachers who had that student in the lower grades, and little they can do to protect the student from the less competent teachers who might come in the succeeding grades. But, in the classroom-teacher system, the teacher in the earlier grade is the teacher in question, and so is the teacher who comes later. In this system, there is no way for the classroom teacher to evade personal responsibility for what happens to the student. As a matter of professional pride, and as a result of being close to the student for years and developing a sense of personal responsibility for the student, it is natural for the teacher to reach out to the parents, co-ordinate the education of her students with those students' specialist teachers, and counsel and guide her students as they grow up.

Complementing accountability to agents outside schools with accountability professional colleagues and parents

Every high-performing country studied in this volume appears to have an effective accountability system. The experience of Germany is an object lesson in that respect. Having believed itself to be among the world's best performers without any means to validate this, it was shocked into action when the data from PISA showed that it was not. But the form that accountability takes differs from country to country and that form of accountability appears to matter.

Some accountability systems publish data on the performance of students and schools to inform the public and the system managers about their performance. In systems that permit parents and students to choose among schools, this data can also influence those choices and thus to hold schools accountable with market forces based on performance data supplied by the schools among which they are choosing (for details, see Chapter 2). In some of the systems this volume has studied, these data are also used by school administrators to allocate resources of various kinds, often to provide additional resources to schools that are struggling.

Beyond that, accountability systems in the best-performing countries can be divided into those that employ administrative (or vertical) accountability and those that employ professional (or lateral) accountability systems.

Administrative accountability refers to systems in which student-achievement test data are used by administrators to reward good teachers, good schools and good districts and to punish teachers, schools and districts that consistently produce poor results. Among the features of administrative accountability are often test-based accountability systems that use data on student performance to make decisions about which teachers and school principals to hire, promote and retain, and for making decisions about the compensation of individual teachers.



Professional accountability refers to systems in which teachers feel themselves accountable not so much to external agents as to their fellow teachers and school principals, as professionals in most fields feel themselves accountable for their performance to other professionals in the same field. In the case of education, professional accountability includes the kind of personal responsibility that teachers feel to the parents of their students in countries that have homeroom teachers or classroom teachers of the sort described in the country chapters.

Jurisdictions such as Ontario in Canada, Japan and Finland that place greater emphasis on the more professional forms of work organisation tend to pursue collegial forms of teacher and school-leader accountability, seeking to ensure that reform becomes a two-way street, rather than something imposed from above. This is because people who expect to be treated as professionals and think of themselves that way are more likely to respond to professional and familial modes of accountability, and to view negatively the use of administrative forms of accountability of the sort that they identify with Tayloristic work environments. The example of Ontario shows how, rather than relying on methods of informed prescription advocating particular uses, the emphasis was placed on creating partnerships with teachers and schools in the field to identify good practices, consolidating these and bringing them to scale. Rather than mandating reform, seed money was put into the field to encourage local experimentation and innovation, sending a strong signal that teacher-generated solutions to weaknesses in reading and mathematics performance were likely to be more successful than solutions imposed from above. The dramatic reduction in the number of low-performing schools was not achieved by threatening to close them but by flooding them with technical assistance and support, on the premise that teachers are professionals who are trying to do the right thing, and that performance problems are much more likely to stem from a lack of knowledge than a lack of motivation. At the same time, the Ontario government made no attempt to dismantle or weaken the assessment regime put in place by the previous government, and consistently communicated the message to the field and the public that results matter, as defined by performance on provincial assessments.

Singapore provides an example where both administrative and professional accountability are combined in an approach centred around performance management, with a wide range of indicators and with involvement of a wide range of professionals in making judgements about the performance of adults in the system. Teachers, principals, ministry and other staff, as well as students, all have incentives to work hard. For maintaining the performance of teachers and principals, serious attention is paid to setting annual goals, garnering the needed support to meet them, and assessing whether they have been met. Data on student performance are included, but so, too, are a range of other measures, such as contributions to school and community, and judgements by a number of senior practitioners. Reward and recognition systems include honours and salary bonuses. Individual appraisals take place within the context of school-excellence plans.

Perhaps the greatest challenge to reform has to do with trust. Trust cannot be legislated. Some may argue that this lesson may be less relevant to others wanting to learn from Finland, especially if one views trust as a precondition for the kinds of deep institutional reforms embodied in the development of the comprehensive school. But in the case of the relationship between teachers and the larger society, one can argue that trust is at least as much a consequence of policy decisions as it is a pre-existing condition. Given the respect that teachers have historically enjoyed in Finland, there was a solid base on which to build reforms. But the combination alluded to in the country report for Finland – much more rigorous preparation, coupled with the devolution of much greater decision-making authority over things like curriculum and assessment – enabled teachers to exercise the kind of autonomy other professionals enjoy. This granting of trust from the government, coupled with their new-found status as university graduates from highly selective programmes, empowered teachers to practise their profession in ways that deepened the trust accorded them by parents and others in the community.

However, it is important that an emphasis on professional accountability at the frontline is not in conflict with the establishment of centralised standards and assessments; rather, these go hand-in-hand.

These are very important issues in the United States right now. Through the previous several administrations, both major political parties have strongly favoured administrative forms of accountability over professional or familial forms of accountability. This may be appropriate because, as noted above, it makes sense to introduce professional forms of accountability only if a nation can rely on appropriate capacity in schools. But if the United States aspires to world-class education performance, it will need to staff its schools with world-class classroom teachers and, when that happens, if the experience of the best-performing countries is any guide, it will need to shift the balance in accountability at some stage more towards professional accountability systems. For the reasons discussed above,

it may prove difficult to attract enough high performers into the teaching service otherwise, because teachers will expect to be treated the way other professionals are treated. The Obama Administration has made a start by encouraging states and districts to move in this direction by using evaluation and support systems to provide teachers with the information and feedback they need to take greater responsibility for the progress of their students, and to create a professional culture in schools focused on collaboration and peer learning.

Investing resources where they can make the most difference

The most obvious point to be made about financing the American education system is its gross inequities, a point that has been the subject of more or less continuous litigation for many years. This issue is discussed in Chapter 2 and is dealt with at some length below. The relationship between the total amount spent, without respect to how it is distributed, and the results obtained for what is spent, may be the single most important factor for the United States.

The PISA data show no strong correlation between the overall amount of money spent on education and student achievement, whether what is spent is calculated on a per capita basis or as a proportion of GDP. Indeed, the United States is a prime example, inasmuch as the United States has long been one of the world's biggest spenders on elementary and secondary education with only average results compared with those in OECD countries.

If the United States is to move from the middle ranks in performance to the top ranks, either it will have to radically improve the efficiency with which its education funds are spent, or it will have to greatly increase the amount spent. But every level of government in the United States faces severe financial constraints, and that situation is likely to remain unchanged for many years to come. So money to finance a great expansion in education spending is not likely available. The challenge is thus to get much more for every dollar spent. The question is how that might be done. The country reports offer several possible approaches.

The first is to keep the general design of the American education system in place, but to make substantial changes in the allocation of funds within that system. The country report on Japan provides a telling example. As pointed out above, Japan puts a greater share of its resources into core instructional services by spending much less on extravagant school buildings, school services (cafeterias and janitorial services), glossy textbooks, elaborate local school-administrative services and expensive sports programmes (the United States spends 11.6% of its resources for schools on capital outlays, a figure that is higher only in the Netherlands, Norway, Luxembourg and Greece, while the OECD average is 7.6%¹¹). Some of what is saved is used to increase teachers' pay substantially relative to American teachers' pay. The rest is returned to taxpayers (public and private spending on schools in Japan only amounts to 2.8% of GDP, as opposed to 3.6% on average across OECD countries and 4% in the United States). Some of these changes would entail major challenges to current American preferences. But that raises the point made above about values and, in particular, the value that Americans place on their children and their children's education vis-a-vis other priorities. The question is: if Americans knew that other countries have produced decidedly better results than the United States by making different spending choices, would they choose to make similar tradeoffs? The United States may benefit from lessons learned in other countries to galvanise around commonly accepted spending choices.

The second possible approach to getting much better results without spending more money to do it is to make basic changes in the way the whole system of education works in the United States. Here again, the country report on Japan provides a telling illustration. Until recently, the teacher/pupil ratio in the United States and Japan were almost identical. But the Japanese chose much larger class sizes than are seen in the United States, up to twice the size of United States classes. That enabled the Japanese to give teachers much more preparation time, lesson-development time, time to confer with other teachers about students facing particular difficulties, and time to tutor students who are behind in class. Same cost, very different approaches.

The example just given shows how both countries had similar ratios of students to teachers. Japanese teachers traded larger class size for more time to plan and work with small groups of students, while American teachers opted for smaller classes and less time to plan and work with small groups of students. As Chapter 2 has shown, other tradeoffs are possible. In the United States, teachers may often be recruited from the lower-performing segment of high school graduates in relatively low status teacher-education institutions, but a substantial share of the teachers who enter the system are gone after five years, and many higher priced specialists are needed to assist the average classroom teacher. In other countries, more is paid to classroom teachers, but that allows those countries to recruit more competitively and train candidates in higher-status teacher-preparation institutions. Those teachers stay in



teaching longer, need to be replaced less frequently and require much less specialised assistance in the classroom. That means that fewer teacher-education institutions are needed and more money can be spent on those that remain on a per-teacher-trained basis. The apparently low-cost solution (hiring lower-quality teachers and training them in lower-cost institutions) can turn thus into a higher-cost solution, when all costs are taken into account. Or consider the costs of operating a Tayloristic management system as opposed to one based on the principles involved in managing professionals. As was just noted, employing lower-cost teachers means that more specialists from central office are needed in schools and more managers are needed in the central office to manage and co-ordinate those specialists. In the top-performing countries, though teachers are paid more relative to classroom teachers, fewer administrators are needed and fewer specialists are required, making it possible to employ higher-quality teachers overall, while still enjoying lower net costs. These are what are called system effects, the result of thinking about the design of the system, as a whole, and the net costs of those systems, rather than thinking only about programmes and programme costs.

The third approach is to allocate resources where the challenges are greatest and those resources can have the largest impact. As shown in Chapter 2, the United States is one of only three OECD countries in which socio-economically disadvantaged schools have to cope with less favourable student-teacher ratios than advantaged schools, which implies that most disadvantaged students may end up with the least resources and the students who come to school with the greatest advantages get the most resources. This also implies considerably lower spending per student for students in disadvantaged schools than what the figures on average spending in Chapter 2 suggest. This problem is discussed below.

It is well established that one of the most important factors affecting a student's performance is the socio-economic background of the other students in the class. The implication is that one of the most important resources to be allocated to schools and classrooms is the students themselves. This volume has shown that Germany's failure to join the northern European nations in moving away from a tripartite secondary school organisation based on social class in the years leading up to and just following the Second World War has made it difficult for that country to provide the quality of education to its lower-income, and especially non-German-speaking, students that they need to have a decent chance to get a qualification and become productive members of German society.

However, this volume has also shown how Germany's dual system gets its intake from every segment of its secondary education system and, in doing so, provides opportunities for all but the lowest stream of German students to advance to the higher, if not the highest, rungs of German society.

The move in Germany to reduce the system from three to two divisions may have also contributed to the impressive improvement in student achievement in recent years. Along the same lines, Poland produced a substantial improvement in overall performance by converting a secondary school system that was organised according to the social class of its 15-year-olds to one in which comprehensive schools enrol all social classes.

And Japan's decision during the Meiji Restoration to break with the kind of school and social structure on which Germany's school structure is still based made it possible for Japan to create schools in which all Japanese children have a very good chance of achieving world-class outcomes, in schools that are heterogeneously organised all over the country. This decision by the Meiji government clearly contributed to that country's ability to produce high overall performance with high equity of results over the past century.

The American reader might wonder how any of this could be relevant in a country whose secondary schools have been organised as comprehensive schools for a long time, and whose elementary schools are open to all. However, there is a considerable amount of tracking and streaming occurring within schools in the United States, in ways that are much less amenable to system-wide policies and practices than is the case in systems where such tracking occurs by design. It tends to be done as a matter of practice and custom, rather than as a matter of formal policy. Students in elementary schools are typically separated into ability groups within the classroom, with each group getting instruction at different challenge levels and, at the high school level, students are often separated into groups that follow different curricula reflecting different levels of cognitive challenge, based on estimates of their ability. In addition, the United States is now virtually alone among the OECD countries in having a system in which its citizens can organise school taxing districts that set their own tax rates and in which, as pointed out before, it is the more advantaged students who tend to enjoy a higher proportion of better-qualified teachers and who tend to get the best of other resources as well.



By contrast, all OECD countries except the United States, Israel and Turkey now devote equal if not more resources to schools facing greater socio-economic challenges.¹² Singapore sends its best teachers to work with the students who are having the greatest difficulty reaching Singapore's high standards. Sweden calculates the Krona that it sends to each school on a formula intended to make sure that every school has what it takes to implement Sweden's demanding curriculum, with the result that isolated communities above the Arctic Circle get more for the education of their students per capita than students in Stockholm do. This is because there will be fewer students in rural high schools to take physics than in the city, so class sizes will be smaller, but students in both places are entitled to physics teachers because physics is a required course in the curriculum. Along the same lines, Swedish schools with a greater share of immigrants receive more resources than schools with fewer immigrants. In Japan, officials in the prefectural offices will transfer good teachers to schools with weak faculties to make sure that all students have equally capable faculties.

Similarly, the most impressive result of Shanghai-China's performance on PISA is not just its high average score, but the very low variability in school performance that is achieved despite considerable social and economic inequalities in the population of the province. This has not come about by chance but, as described in the country report, should be seen in the context of determined efforts to improve the school system by converting "weaker schools" to stronger schools. These efforts include:

- systematically upgrading the infrastructure of all schools to similar levels;
- establishing a system of financial transfer payments to schools serving disadvantaged students and transferring high-performing teachers from advantaged to disadvantaged schools, either temporarily¹³ or permanently;
- pairing high-performing districts and schools with low-performing districts and schools, where the authorities in each exchange and discuss their educational development plans with each other and work together to deal with problems such as teachers' development, and where institutes for teachers' professional development affiliated with both authorities share their curricula, teaching materials and good practices;
- implementing arrangements under which the government commissions "strong" public schools to take over the administration of "weak" ones, by having the "strong" school appoint its experienced leader, such as the deputy principal, to be the principal of the "weak" school and sending a team of experienced teachers to lead in teaching, in the expectation that the ethos, management style and teaching methods of the high-performing school can be transferred to the poorer-performing school.

Contrast this with a system of school finance in the United States that allows wealthy people to form a school taxing district with other wealthy people who, collectively, are able to pay very low tax rates and produce very large tax revenues, enabling these wealthy people to hire the best teachers in the state for their children and to surround their children with other children from other wealthy families, thereby creating overwhelming educational advantages for their children. At the other end of the spectrum, poor families, who cannot afford the homes that are available in the communities that are home to wealthy people, end up paying very high tax rates but raising very little revenue. While the best-resourced school districts get buildings that are richly equipped with advanced science laboratories, sophisticated equipment, elaborate theatres, Olympic-sized swimming pools and advanced computer-based graphics labs, as well as teachers who majored in the subjects they teach at some of the most elite colleges in the country, the schools serving the poor must content themselves with old and worn school buildings and some of the least competent teachers in the state. In between are many gradations of educational opportunity, each calibrated to a different socio-economic segment of the population.

What Germany accomplished indirectly by having different secondary schools for students from different social classes, the United States achieved directly through its system of local control of school finance. The effect of that system is exactly the same as the effect of having different schools for different socio-economic segments of the population in other countries. There are schools for the rich, schools for the middle classes, schools for the working classes and schools for the poor. The difference is that in those few industrialised countries that still practice this sort of streaming, it is practiced only at the secondary level, while the United States continues to practice this sort of social class segregation at the elementary or primary school level, as well as the secondary level.

In the introduction to this volume, the point was made that, in the early stages of a country's economic development, the demand for highly educated people is limited and so are the resources for developing such people. One way to meet that need in those circumstances is to put what money there is into the children who are, by virtue of the education and income of their parents, the most advantaged students in the whole society. That is why segregating



schools by social class was a very efficient strategy providing education when the United States was in the heyday of mass-production. But now, when far larger proportions of highly educated people are demanded in the world's high-wage economies, it is not only socially unjust but highly inefficient to organise an education system this way. Until the 1960s, most northern European countries organised their education systems in ways that were very similar to Germany's current tripartite system, but, for all the reasons just stated, they have since abandoned that approach.

Some years ago, when the immigration of low-literacy guest workers was rapidly increasing in Europe, the Netherlands chose to accommodate them in large housing blocks specially constructed for their use in the cities. The Flemish Community of Belgium, whose schools are run on policies very similar to those in the Netherlands, chose to give vouchers to guest workers to supplement the amount that they would otherwise have to spend on housing. They could use these vouchers wherever they wished. The result was that there were fewer Flemish schools composed entirely of the sons and daughters of guest workers. Years later, the Netherlands faced an enormous challenge to educate students from the public housing projects, whom they have not been able to successfully integrate into their education system and whose achievement remains very low. But in the Flemish Community of Belgium, the students from families indistinguishable from the immigrant families in the Netherlands are doing far better. Housing segregation led to school segregation in this case. In other cases reviewed in this volume, there was school segregation without housing segregation. In the United States, there is both housing segregation and school segregation caused by income disparities and by local control of school finance. The results are the same as can be seen in the other countries studied where one or the other of these two kinds of segregation are practiced.

It is noteworthy that Canada had a similar system of school financing to that in the United States, but it has been abandoning that system in recent years by shifting funding entirely or almost entirely to the province level. Provinces now provide block grants based on numbers of students; categorical grants used either to fund particular programmatic needs (e.g. special education) or to help districts meet specific challenges in providing basic services (e.g. more remote districts need more funds for transportation); and equalisation funding, which is used in the districts that retain some local funding to equalise the poorer districts.

For the United States, following the lead of its neighbour to the north and gradually changing the system of school finance and organisation to abandon local financing of education would be, of course, a very complex matter involving tax, education and housing policy, housing values, race relations, local control vs. state control and much more. No one should, and few would, underestimate the difficulties involved. But it is hard to see how the United States can succeed in matching the performance of the world's highest-performing countries unless it levels the playing field for its students in the way that almost all of its competitors have already done.

Very recently, the United States announced the formation of an "Equity and Excellence Commission" that will examine and make recommendations around addressing the inequities in the United States system of school finance and K-12 education. The above lessons from other countries may be informative in addressing these issues.

Any serious effort to redress the inequities in school finance in the United States would, of course, have to take into account the effects on children of the growing inequalities in income in the United States. There is perhaps no better example for how this can be addressed than Finland's full-service schools described earlier. These provide a daily hot meal for every student, as well as health and dental services, which also offer guidance and psychological counselling, and access to a broader array of mental health and other services for students and families in need. None of these services is means-tested. Their availability to all reflects a deep societal commitment to the well-being of all children. But because spending choices are made differently, at the end of the day, Finland spends considerably less on its schools than does the United States.

Balancing local responsibility with a capable centre with authority and legitimacy to act

Many countries have pursued a shift in public and governmental concern away from mere control over the resources and content of education towards a focus on outcomes. This becomes apparent when changes in the distribution of decision-making responsibilities in education are reviewed across successive PISA assessments. Coupled with this have been efforts to devolve responsibility to the frontline, encouraging responsiveness to local needs. As noted before, PISA shows a clear relationship between the relative autonomy of schools and schooling outcomes across systems – when autonomy is coupled with accountability.



The data presented in Chapter 2 shows that, once the state has set clear expectations for students, school autonomy in defining the details of the curriculum and assessments relates positively to the system's overall performance. For example, school systems that provide schools with greater discretion in making decisions regarding student assessment, the courses offered, the course content and the textbooks used, tend to be school systems that perform at higher levels on PISA. Data from PISA also show that in school systems where schools do not post achievement data publicly, a student who attends a school with greater autonomy in resource management than the average OECD school tends to perform worse than a student attending a school with an average level of autonomy. In contrast, in school systems where schools do post achievement data publicly, a student who attends a school with above-average autonomy scores higher in reading than a student attending a school with an average level of autonomy.

Of course, the United States is a decentralised education system too, but while many systems have decentralised decisions concerning the delivery of educational services while keeping tight control over the definition of outcomes, the design of curricula, standards and testing, the United States is different in that it has decentralised both inputs and control over outcomes. That has only just begun to change with the recent introduction and progressive adoption of common core educational standards by states. Moreover, as discussed in the above section on work organisation, management and accountability, while the United States has devolved responsibilities to local authorities or districts with decentralised union-management agreements, their schools often have less discretion in decision-making than is the case in many OECD countries. In this sense, the question for the United States is how to build the capacity for all schools to exercise responsible autonomy, as happens in most of the systems discussed in this volume. All in all, the United States has allocated authority for governing education more diffusely than any other nation studied in this volume.

Contrast this with the case of Ontario. Here the role of the ministry is to set clear expectations and targets, provide funding, create a working collective-bargaining agreement that supports improved teaching and learning, provide external expertise, and provide support for struggling schools. The role of the district is to align its personnel and hiring policies with the overall strategy, and support the schools as they go through continuous processes of learning. Much of the real action happens in the schools, where teachers work in communities to think about practical problems and learn from one another. While the mission and pressure comes from the top, there is clear recognition that it is at the school level where change has to be implemented, and that the role of other actors in the system is to support the learning and change occurring in schools. An important, yet often underestimated, barrier to achieving system coherence is often the lack of a shared understanding among stakeholders about how key government leaders see the problems of the system and what lies behind the policies and programmes they have designed in response. The tireless efforts of the Ontario government to build a sense of shared understanding and common purpose among stakeholder groups provides an example of how this can be achieved.

Singapore's "thinking schools – learning nation" reform pursued similar goals, organising schools with greater autonomy into geographic clusters that were given more autonomy, with successful principals appointed as cluster Superintendents, to mentor others and promote innovation. Along with greater autonomy came new forms of accountability. The old inspection system was abolished and replaced with a school-excellence model, under which each school sets its own goals and annually assesses its progress towards them against nine functional areas: five "enablers" and four results areas in academic performance.¹⁴ As described in the country report, greater autonomy for schools also led to a laser-like focus on identifying and developing highly effective school leaders who can lead school transformation, backed up by an external review every six years.

Importantly, all of the high-performing systems studied in this volume have some level of authority in their system of education governance at which the buck stops, some agency or group of agencies that can be said to be responsible for the effectiveness and efficiency of the whole education system. This is typically the national or state ministry of education. As preceding chapters show, these agencies are held responsible by everyone concerned for the effectiveness and efficiency of education in their state or nation. They tend to attract capable people. Employment in these agencies is widely thought to be a worthy goal for leading educators in these countries. Their wishes are taken seriously, even if not mandated by law, because of the respect in which their staff is held. Because they are held accountable for the quality and efficiency of education in their country, they assume responsibility for long-range planning for their education systems. They commission research to assist them in making those decisions. They make deliberate use of that research in their decision-making.



All of this has consequences. The various parts of the education systems in these countries appear to have been designed to work harmoniously with each other. These systems can make effective plans and can mobilise the capacity to make sure those plans are carried out. They have the capacity to do the necessary analyses, deliver effective support to the field, monitor the degree to which their plans are being implemented, judge the results and change course if needed. If a country or a state or group of states in a federal system lacks this capacity, it may not be able to make comprehensive, coherent plans; and if it has the capacity to plan, it may not matter very much what its policies are if the nation or state lacks the staff needed to carry them out well.

All this may sound obvious, but it is important to note that no unit of government at any level of the American education system seems to have the authority of a ministry of education in most of the countries portrayed here – not at the national level, not at the state level and not at the local level. Furthermore, the National Center for Education and the Economy has found that the average state department of education has less than half the staff it had 15 years ago,¹⁵ when they all had many fewer responsibilities than they do now. Indeed, in recent years, the federal government has turned to state departments of education to produce very detailed, complex plans for improving education in their state, monitoring student progress, administering complex accountability programmes, developing curricula, and creating new state-wide assessment programmes, even as their staffs were cut by state legislatures running short of tax receipts. The experience of the best-performing countries suggests that high performance relies on the willingness to invest in the capacity to do the planning and management necessary to produce high performance at scale.

The experience of countries with federal oversight for education provides useful insights on how states can collaborate to establish national policies in areas where coherence is important. Canada's Council of Ministers of Education provides a forum through which provincial Ministers of Education meet frequently for co-ordination purposes. While the formal powers of this body are limited, as it can make decisions only by consensus, it fulfils an important information-sharing function and enables good ideas and practices to spread across provincial lines. The power of ideas and the possibilities of diffusion have generated good practice and encouraged jurisdictions to learn from and blend in with each other. In the case of Germany, the federal government is prohibited by the constitution from doing much more than supporting research; but the states, operating through a council of state ministers, have created a strong set of national standards and a reporting system to match.

The importance of workplace training to facilitate school-to-work transitions

Thus far, this volume has focused on school education. This section, however, turns to a closely allied arena of public policy that is often forgotten but which emerges from the research done for this study as highly important to countries that see their education system as a powerful tool for producing a globally competitive workforce. There seems broad agreement all over the world that education should be about much more than preparation for work. But there is also agreement that preparation for work is a very important goal of education. The evidence strongly suggests that effective preparation for work entails success in academic courses, the acquisition of strong generic work skills – everything from showing up on time and putting in a good day's work to being an effective team member and working to meet deadlines – and technical competence in the job-specific skills needed to do the entry-level work in careers that pay well. Countries vary widely in the degree to which they provide each of these bundles of skills and knowledge. In countries that do well on all three, youth unemployment tends to be lower, it takes less time for young people to get and keep good jobs, and economic competitiveness is higher, so there are strong reasons for a country to pay attention not just to the development of young people's academic skills and knowledge but to make sure it has a strong school-to-work transition system.

Germany and Japan present two different examples of countries with strong systems of that sort. Germany's dual system, in which the two-thirds of students who enrol in the vocational tracks alternate between a few days in school and a few days at the workplace, is famous for its success in enabling young people from widely varying social backgrounds to integrate the learning of academic skills with the mastery of job-specific skills, so that students understand the theory behind the practice as they practice their generic work skills. For many, perhaps most, employers, the generic work skills – motivation, persistence, effort, discipline and interpersonal skills – are essential. And for many students, this practice-based, highly applied learning system is a far more effective way to learn than sitting in school studying material with no obvious application to anything they know or care about. In addition, OECD research suggests that workplace training facilitates recruitment of employees because potential employers and employees get the chance to get to know each other and apprentices make productive contributions such that employers benefit directly from the training.



The Japanese system is very different. There, as discussed in the chapter on Japan, students do not work until they leave school and enter the full-time workforce. But most firms in Japan invest heavily in the further formal and informal education of their young workers. Indeed, a good deal of the new employee's initial time in the workplace is devoted to a continuation of the educational process begun in school, and there is a heavy dose of mentorship for new employees. Though the system is very different from that in Germany, the results are surprisingly similar.

At first glance, neither of these systems is readily transferable to the United States, because both appear to depend on industrial systems that are very different from those that prevail in the United States, and for other reasons, including what appears to be a cultural disposition on the part of employers, including prestigious, high-paying employers, to invest heavily in the education and training of young people. But the point was made in the chapter on the German system that German employers do not do offer apprenticeships out of the goodness of their hearts, but because it makes good business sense to do so.

There is no reason, in principle, why the United States could not extend its apprenticeship programmes by providing incentives to American employers to offer apprenticeships to more young people. As in Germany, those incentives could involve relaxing minimum-wage standards, and could also include providing certain tax breaks, including payroll-tax breaks. A combination of appropriate incentives and regulations could establish relationships among community colleges and other postsecondary institutions, regional technical schools and employers that could bring to the United States many of the benefits of the German dual system help extend workplace training more generally, including in the form of internships and shorter work placements as an alternative to full apprenticeships requiring multi-year apprenticeship contracts.

The point here is not to make a particular policy proposal but rather to point out that a careful study of the incentive structures that underlie some of the most effective school-to-work systems in the world could be adapted to the American context in ways that could produce major gains for American education, American business and American youth.

Ensuring coherence of policies and practices, aligning policies across all aspects of the system, establishing coherence of policies over sustained periods of time and securing consistency of implementation

As described throughout this volume, the most successful education systems are setting goals for the curriculum and for student achievement that emphasise the attainment of complex, higher-order thinking skills and the ability to apply those skills to problems they have never seen before, rather than the mastery of the kinds of basic skills they formerly settled for as a minimum standard. They are shifting the structure of their systems from ones that track students from different social backgrounds into different schools and programmes, intended to supply the economy with workers suited for elite jobs, middle-class jobs, working-class jobs and lower-class jobs towards systems designed increasingly to provide almost all workers with the skills needed for jobs previously thought to be held only by elite workers. Many countries on this trajectory are working to improve the quality of the pool from which they recruit their teachers, and they are finding that, in order to recruit and retain these young people, they need to abandon bureaucratic and administrative control for systems in which accountability to other professionals and to parents produces a constant pressure for improved performance. They find that they have to finance their education systems so that all students have access to the educational resources they need to meet high standards.

These are not independently conceived and executed changes. They are, and were, pieces of a whole. In high-performing education systems, policies and practices tend to be aligned across all aspects of the system, they tend to be coherent over sustained periods of time, and they tend to be consistently implemented without excessive administrative control. That is not to say that the process of reform is smooth. The preceding chapters show that the path is often confusing, fraught with political controversy and sometimes clouded. Quite apart from the inevitable political economy issues, moving away from administrative and bureaucratic control towards professional norms of control can be counterproductive if a nation does not yet have teachers and schools with the capacity to implement these policies and practices. Pushing authority down to lower levels can be as problematic if there is not agreement on what the students need to know and should be able to do, and if the standards are not high enough. Recruiting high-quality teachers is not of much use if those who are recruited are so frustrated by what they perceive to be an inadequate system of initial teacher education that they will not participate in it and turn to another profession. Or if they become school teachers, but are so turned off by the bureaucratic forms of work organisation they find there that they leave teaching for some other occupation.



Thus a county's success in making these transitions depends greatly on the degree to which it is successful in creating and executing plans that, at any given time, produce the maximum coherence in the system. No country does this perfectly, though Finland, Japan, Ontario in Canada, Singapore, Hong Kong-China and Shanghai-China seem to have had success in this respect over the years. Singapore demonstrates perhaps the most consistent alignment between policies and their implementation, in which the Ministry of Education, the National Institute for Education and schools share responsibility and accountability. No policy is announced without a plan for building the capacity to implement it. One of the most striking things about visiting Singapore is that the visitor hears the same clear focus on the same bold outcomes, careful attention to implementation and evaluation, and orientation towards the future wherever he or she goes – whether in the ministries of manpower, national development, community development, or in the universities, technical institutes, or schools. “Milestone” courses bring together top officials from all the ministries to create a shared understanding of national goals. And a focus on effective implementation runs throughout the government. “Dream, Design and Deliver” is an apt characterisation of Singapore's approach to public administration. Because of the value placed on human resource development and the understanding of its critical relationship to economic development, Singapore's government provides a very clear vision of what is needed in education. This means that the Ministry of Education can then design the policies and implement the practices that will meet this vision. Whenever a policy is developed or changed, there is enormous attention to the details of implementation – from the Ministry of Education, to the National Institute of Education, cluster superintendents, principals and teachers. The result is a remarkable uniformity of implementation and relatively little variation across schools.

While different mechanisms would be needed in the much larger and more multi-layered and decentralised system of the United States, finding ways to make all the parts work together is essential for producing the best results. The lesson for the United States is that, no matter where a country or state is on the development spectrum, coherence – the degree to which the parts and pieces fit well together and reinforce each other – is an important feature of system effectiveness. This is particularly important for the United States precisely because its education system is inherently less coherent than that of almost every other industrialised country. This is because, as noted above, there is no government body, at either the state or national level, that has responsibility for co-ordinating the different parts of the system. It is not because the United States has a federal system in which the states have some authority, especially in education. That is just as true in Canada, whose results are decidedly superior. In Canada, however, the provincial offices of education also have the legitimacy and capacity to do the job that needs to be done at the centre to bring all the parts and pieces together.

The United States risks lagging behind the most advanced education systems unless it can find a way to ensure that: the tests it uses are evaluating what students should be taught; the instructional materials that are available match the content that teachers are supposed to be teaching; schools of education are preparing teachers to teach what the state expects students to learn; there is a pool of potential teachers who are up to the task; the standards for admission to the institutions that prepare teachers are high enough to attract the kinds of people who will be needed; the programmes of those institutions are designed to attract young people who could choose to be doctors and architects and engineers; the incentives that influence young people include those to take tough courses and work hard in school; the credentials that young people learn in school match the needs and expectations of employers and colleges; and so on. This is a partial list, but the point should be clear: the parts and pieces have to fit together, and there will be a lot of them in a successful plan.

The United States has a variety of initiatives under way to address many of these challenges in areas including assessment quality, instructional materials and supports, recruitment of high-calibre teaching candidates, alignment of teacher preparation with classroom needs, and the alignment of standards for student learning with the expectations of employers and colleges. As these initiatives continue and develop, the United States needs to pay close attention to the coherence of these initiatives and to support effective implementation at the state and local levels.

Ensuring an outwards orientation of the system to keep the system evolving, and to recognise challenges and potential future threats to current success

Looking at five of the world's highest performers examined in this volume – Finland, Canada, Japan, Shanghai-China, Singapore – the reader will see five of the world's most determined international benchmarkers. In his interview for this volume, Premier McGuinty in Ontario made a point of saying that his own views about the right strategy for Ontario to pursue were shaped by the visits he made to other countries with high education performance to see how they did it. Finland was benchmarking the performance and practices of the world's best performers in the run-up to its dramatic emergence as one of the world's top performers. Japan launched its long-running career as one of the world's leading



performers when the government that it installed during the Meiji Restoration visited the capitals of the industrialising West and decided that it would bring back to Japan the best the rest of the world had to offer in education policy and practice. It has been doing so ever since. When Deng Xiaoping took the helm in China and launched its rise on the world's industrial stage, he directed China's education institutions to form partnerships with the best educational institutions in the world and to bring back to China the best of their policies and practices. In the latter half of the 20th century, Singapore did exactly what Japan had done a century earlier, but with even greater focus and discipline. Singapore's Economic Development Board, the nerve centre of the Singaporean government, is staffed with many engineers who view the government and administration of Singapore as a set of design challenges. Whether Singapore is interested in designing a better sewer system, retirement system or school system, it sends key people in the relevant sector to visit those countries that are the world's best performers in those areas with instructions to find out how they do it, and to put together a design for Singapore that is superior to anything that they have seen anywhere. Whenever Singapore seeks to create a new institution, it routinely benchmarks its planning to the best in the world. If Singapore is not in a position to create a world-class institution in a particular field, it will try to import the expertise. All Singapore educational institutions – from the National University of Singapore (“A global university centred in Asia”) to individual schools – are being encouraged to create global connections in order to develop “future-ready Singaporeans”. They have never stopped learning from other countries as systematically as possible. A strong and consistent effort both to do disciplined international benchmarking and to incorporate the results of that benchmarking into policy and practice is a common characteristic of the highest-performing countries.

AMERICA'S ASSETS

The United States brings many assets to the table to catch up with the world's most advanced education systems. The challenge is to leverage these assets in the same ways that today's high performers have leveraged their economic and cultural assets to create superior educational outcomes. Germany has made the most of its heritage of Romantic Idealist philosophy and effective apprenticeship. Finland has made the most of its age-old veneration of teachers and its capacity to engage its people in its great efforts of survival in perilous times. Canada has turned what might have been a weakness in its federal system into a national asset. Japan has made the most of its meritocratic values. These countries, while similar on many of the general principles involved in making first-rate national education systems, have recognised that there are tradeoffs among the goals they all share, and they have chosen different priorities among those goals and employed different strategies to realise them. Each country has faced different obstacles in implementing its designs and has developed different ways to surmount those obstacles.

One of the American assets is the amount of money American citizens are willing to invest in public education – more per student than any other country save one. This means that there is a lot of room to get better performance by reprogramming what is currently being spent.

The second great asset of the United States is its history of reform, in education and in general. While many Americans may worry that their politics are gridlocked and little in education is really changing, the history of the United States tells a story of endless fundamental change. The whole system of public education in its current form was established in the first two decades of the 20th century in one great wave of reform. The schools of the United States were racially desegregated in a comparable period of time. Common standards were instituted with national agreement to create matching assessments. These are massive changes. In each one of these cases, what was instituted was widely considered practically impossible before it actually happened. The impact that *Race to the Top* has already had in its first year on shaping the discourse on education in the United States, on state legislation and on the behaviour of key stakeholders shows what can be achieved if the direction is clear and the incentive structures are working.

The third great asset of the United States education system is its status as an engine of innovation. Examples of fresh, exciting and practical education ideas can always be found somewhere in the United States. As was noted earlier, that is why the United States is a mandatory destination for people from all over the world interested in new and useful ideas in education. American education is nothing if not inventive, and that is a great asset in age in which the future depends on doing things differently.

The United States is also the locus of the largest concentration of education researchers and analysts in the world, even if that remains true only in absolute and no longer in relative terms. This is a great scientific asset that can be enlisted in a disciplined search for better ways of doing things. Consider the possibilities if the Singaporean zest for international benchmarking research was married to the technical capacities of the American educational research establishment.



It is time to return to the analytical framework with which this volume began. It started with the observation that, as countries move from low-income, low-valued-added economic systems in which countries compete on price to high-income, high-value-added economic systems in which they compete on quality and innovation, they tend to move from one end of this dimension line to another as their economies change and they accumulate the resources needed to enable them to take the next step in the development of their education system.

One can see how this process is working in Brazil, as it tries to overcome a history of ignoring the educational needs of its native population, and in Poland, as it moves towards a more inclusive stance in its education policy. The linkage between education and economic development has been particular close in Singapore, driven from the top of government. As Singapore evolved from an economy based on port and warehousing activities, through a low-wage, labour-intensive manufacturing economy, then to a more capital- and skill-intensive industry and finally to its current focus on knowledge-intensive industrial clusters, the education system ramped up the quality of its work force to make Singapore globally competitive. None of these countries has moved all the way towards the right hand side of the economic development spectrum, but they are well on the way.

The lesson for the United States might be that different states, even some regions within states, or regions across several states, might be at different points on the economic development spectrum. Some states might be in a situation not far from that of Brazil, where the priorities are setting up effective systems for tracking student and school performance, establishing standards for student achievement, making sure that teachers meet minimum qualification standards, producing more equity in school finance, developing a cadre of experienced professionals who can help out struggling schools, and so on. These states are likely to find, just like Brazil and other nations at a similar stage of their development have found, that the most effective management systems are those in which there is a lot of detailed direction from the top, administrative accountability works best, and the curriculum needs to be specified in some detail.

Other states might be at a very different point on the development curve. They might have the management, financial resources and institutional infrastructure needed to match the performance and adopt the systems developed by the world's most educationally advanced countries. Where their education systems do not yet match the best-performing systems, they might directly adapt the methods used by Finland, Canada and the East Asian countries. They will be in a position to recruit a substantial proportion of their teachers from among the best university students in the country and offer them a lot of discretion in the way they do their jobs. They will be looking for ways to build the capacity of their systems and support their teachers. Their accountability systems will tend to the professional model, not the administrative model. Rather than regulating and directing what goes on in the school, they will focus on devising incentives and support systems that will align the interests of the school faculty with the public interest.

Most states will be somewhere in between, and the challenge will be to develop policies that encourage states to move forwards on this trajectory. There is no one best system. But as this volume demonstrates, there are clear pathways from any starting point on the trajectory to wider participation, raising the quality of educational outcomes, improving equity in the distribution of educational opportunities and producing greater value for money.

The international achievement gap is imposing on the United States economy an invisible yet recurring economic loss that is greater than the output shortfall in what has been called the worst economic crisis since the Great Depression. As noted in Chapter 2, the gains from improved learning outcomes, put in terms of current GDP, exceed today's value of the short-run business-cycle management by far. This is not to say that efforts should not be directed at ways to mitigate the effects of the economic recession, but it is to say that long-term issues cannot be neglected.

The world is indifferent to tradition and past reputations, unforgiving of frailty and ignorant of custom or practice. Success will go to those individuals and countries that are swift to adapt, slow to complain and open to change and continuous learning from the best in the world. The task of governments will be to ensure that countries rise to this challenge.

The OECD will continue to help countries support these efforts through facilitating peer-learning and collaboration among countries. Competitiveness in education is not a zero-sum game, in which one nation's gain is necessarily another country's loss. Instead, enhancing educational achievement – at home and abroad – is a win-win for the world.



Notes

1. The address was presented at the meeting of the OECD Education Committee at Ministerial level on 4 November 2010 in Paris.
2. The Third International Mathematics and Science Study (TIMSS) shows that the national percentage of students who report that to do well in mathematics or science they needed good luck was negatively related to student performance in these subjects, both within and across countries. For details, see Earling E. Boe (2002), *Predictors of National Differences in Mathematics and Science*, Research Report No. 2002-TIMSS2, University of Pennsylvania.
3. As described in the country report for Canada, an important element in the development of the Student Success strategy was the creation of a new programme in high schools called the High Skills Major. This aimed to take high school students who were not engaged by the traditional academic curriculum and give them a different menu of courses. While earlier approaches in this vein have justifiably been accused of tracking working-class students away from higher end jobs, by working with prospective employers, the High Skill Major programme created more hands-on courses to give students practical skills and lead to employment opportunities.
4. Among OECD countries, in the Czech Republic, Denmark, Estonia, Finland, France, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, the Netherlands, New Zealand, Norway, Poland, the Slovak Republic, Slovenia, Turkey and the United Kingdom, standards-based external examinations exist throughout the secondary education system. In Australia, they cover 81% of secondary students, in Canada 51% and in Germany 35%. In Austria, Belgium, Chile, Greece, Mexico, Portugal, Spain, Sweden, Switzerland and the United States, such examinations do not exist or only exist in minor parts of the system (Table IV.3.11 in *PISA 2009 Results Volume IV*). Across OECD countries, students in school systems that require standards-based external examinations perform, on average, over 16 points higher than those in school systems that do not use such examinations (Figure IV.2.6a in *PISA 2009 Results*).
5. As described in the country report for Finland, the admission process occurs in two stages. The initial paper screen is based on the applicant's Matriculation Exam score, upper secondary school record, and out-of-school accomplishments. Those who pass that screening must then take a written exam; be observed in a teaching-like activity in which their interaction and communication skills can be assessed; and finally be interviewed to assess, among other things, the strength of their motivation to teach.
6. OECD (2010), *Education at a Glance 2010*, Table D3.1, OECD Publishing.
7. The ministry also created the Ontario Education Partnership Table where a wider range of stakeholders could meet with ministry officials two to four times a year.
8. As described in the country report, included in this Enhanced Performance Management System is their contribution to the academic and character development of the students in their charge, their collaboration with parents and community groups, and their contribution to their colleagues and the school as a whole.
9. OECD (2008), *Improving School Leadership*, OECD Publishing.
10. The effect of parental pressure is particularly closely related to socio-economic background, with little independent effect, whereas factors related to the climate within the school such as discipline and student-teacher relationships are also related to performance independently of socio-economic and demographic effects in many countries.
11. OECD (2010), *Education at a Glance 2010*, Table B6.2, OECD Publishing.
12. For example, Chapter 2 shows that in around half of OECD countries, the student-teacher ratio relates positively to the socio-economic background of schools, in other words, disadvantaged schools tend to have more teachers per student.
13. Teachers transferred temporarily from rural to urban schools are expected to return to the rural schools to enrich them with their new urban experiences.
14. The five enablers are leadership, staff management, strategic planning, resources and student-focused processes. The four result areas are outcomes of holistic development of students, which includes academic results, staff well-being results, administrative and operational results, and results of engagement with partners and community.
15. Tucker, Marc and Tom Toch (May 2004), "Hire Ed", in *The Washington Monthly*, Washington, DC.