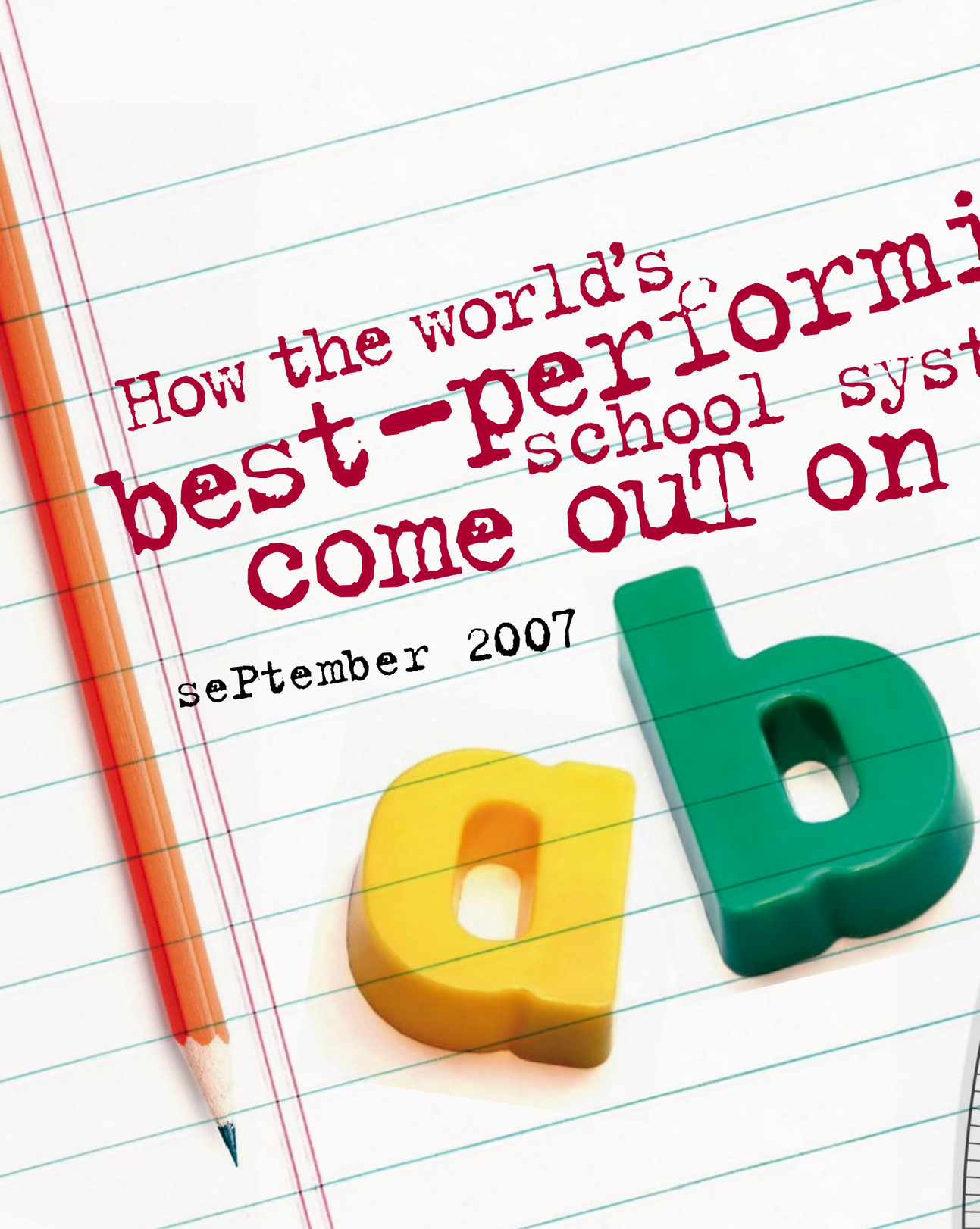
How the world's best-performing school systems come out on top

September 2007



McKinsey&Company

I ♥ School

Executive Summary

Education reform is top of the agenda of almost every country in the world. Yet despite massive increases in spending (last year, the world's governments spent $2 trillion on education) and ambitious attempts at reform, the performance of many school systems has barely improved in decades. This is all the more surprising because there are wide variations in the quality of education. For instance, in international assessments, less than one percent of African and Middle Eastern children perform at or above the Singaporean average. Nor is this solely the result of the level of investment. Singapore, one of the world's top performers, spends less on primary education than do 27 of the 30 countries in the OECD.[1]

Changing what happens in the hearts an minds of millions of children – the main charge of any school system – is no simple task. That some do so successfully while others do not is indisputable. So why is it that some school systems consistently perform better and improve faster than others?

There are many different ways to improve a school system, and the complexity of this task and the uncertainty about outcomes is rightly reflected in the international debate about how this should best be done. To find out why some schools succeed where others do not, we studied twenty-five of the world's school systems, including ten of the top performers. We examined what these high-performing school systems have in common and what tools they use to improve student outcomes.

The experiences of these top school systems suggests that three things matter most: 1) getting the right people to become teachers, 2) developing them into effective instructors and, 3) ensuring that the system is able to deliver the best possible instruction for every child.

These systems demonstrate that the best practices for achieving these three things work irrespective of the culture in which they are applied. They demonstrate that substantial improvement in outcomes is possible in a short period of time and that applying these best practices universally could have enormous impact in improving failing school systems, wherever they might be located.

Contents

Acknowledgements

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Foreword

The capacity of countries - both the world's most advanced economies as well those experiencing rapid development - to compete in the global knowledge economy increasingly depends on whether they can meet a fast-growing demand for high-level skills. This, in turn, hinges on significant improvements in the quality of schooling outcomes and a more equitable distribution in learning opportunities.

International comparisons, such as the OECD's Programme for International Student Assessment (PISA) make it now possible to regularly and directly compare the quality of educational outcomes across education systems. They reveal wide differences in the extent to which countries succeed in fostering knowledge and skills in key subject areas. For some countries, results from PISA have been disappointing, showing that their 15-year-olds' performance lags considerably behind that of other countries, sometimes by the equivalent of several years of schooling and sometimes despite high investments in education. International comparisons have also highlighted significant variation in the performance of schools and raised strong concerns about equity in the distribution of learning opportunities. Last but not least, they suggest that there is significant scope for improving educational efficiency such that, across OECD countries, taxpayers could expect 22% more output for their current investments into schooling.

However, comparisons like PISA also provide very encouraging insights. Across the globe - whether it is Canada in North America, Finland in Europe or Japan and Korea in Asia - some education systems demonstrate that excellence in education is an attainable goal, and at reasonable cost. They also show that the challenge of achieving a high and socially equitable distribution of learning outcomes can be successfully addressed and that excellence can be achieved consistently throughout the education systems, with very few students and schools left behind.

But measuring performance does not automatically lead to insights as to what policy and practice can do to help students to learn better, teachers to teach better, and schools to operate more effectively. This is where McKinsey's report comes in, with its first-of-its-kind approach that links quantitative results with qualitative insights on what high-performing and rapidly improving school systems have in common. With a focus on issues that transcends cultural and socio-economic contexts, such as getting the right people to become teachers, developing those people into effective instructors, and putting in place targeted support to ensure that every child can benefit from high-quality instruction, the report allows policy-makers to learn about features of successful systems without copying systems in their entirety.

By enabling policy-makers to examine their own education systems in the light the best performing systems that set the standards of what can be achieved, the report provides policy-makers with a unique tool to bring about improvements in schooling and better preparation for young people as they enter an adult life of rapid change and deepening global interdependence. Comparative analyses of this kind will become ever more important, as the best performing education systems, not simply improvement by national standards, will increasingly become the yardstick for success. Countries will not simply need to match the performance of these countries but do better if their citizens want to justify higher wages. 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 which are swift to adapt, slow to complain and open to change. The task for governments will be to ensure that countries rise to this challenge.

Andreas Schleicher
Head, Indicators and Analysis Division,
Directorate for Education, OECD

Preface

This report is the result of research carried out by McKinsey & Company between May 2006 and March 2007. Its objective has been to understand why the world's top-performing school systems perform so very much better than most others and why some educational reforms succeed so spectacularly, when most others fail.

Our focus is primarily on how differences in what is happening at the level of the school system impacts what is happening in the classrooms, in terms of enabling better teaching and greater learning. We have chosen not to focus on pedagogy or curricula, however important these subjects might be in themselves. These subjects are well-debated in the literature. There is much less focus elsewhere on the school 'system' itself – the critical infrastructure that underpins performance – and how to ensure that it delivers great education for every child.

The report is the outcome of an analysis of the achievements of the best-performing school systems as defined by the OECD's Programme for International Student Assessment (PISA), a survey of the current literature,[2] and interviews with more than one hundred experts, policymakers and practitioners. In the course of this research we have visited schools from Wellington to Helsinki and from Singapore to Boston in order to benchmark more than two dozen school systems in Asia, Europe, North America and the Middle East.

The school systems we have benchmarked were selected to represent two different categories in order to balance the analysis of current high achievement with developing an understanding of the route by which others can get there

Exhibit 1: **School systems benchmarked**

Systems in the top ten in the OECD's PISA (2003)[1]	Systems with strong improvement trajectory [4]
• Alberta[2]	• Atlanta
• Australia	• Boston
• Belgium	• Chicago
• Finland	• England
• Hong Kong	• Jordan
• Japan	• New York
• Netherlands	• Ohio
• New Zealand	
• Ontario[2]	
• Singapore[3]	
• South Korea	

The team also understood the reform direction rationale of five other school system that are currently launching improvement programs

1. OECD's Programme for International Student Assessment, examination every three years of reading, math, and science skills of 15-year olds. Liechtenstein and Macao also scored in the top ten in 2003 but were excluded for technical reasons.
2. Canada scored 5th overall on PISA; Alberta and Ontario were included as representative provinces
3. Singapore did not participate in PISA; Singapore scored top in both science and mathematics in TIMSS 2003
4. Systems with high improvement rates according to the US National Assessment of Educational Progress (NAEP) or TIMSS scores. In addition, Boston and New York have been consistent finalists of the Broad Prize for Urban Education

Source: PISA, McKinsey

(Exhibit 1). The first group includes the world's top ten best-performing school systems according to the OECD's Programme for International Student Assessment (PISA); the second group comprises those that are improving rapidly, having recently introduced reforms that are raising student outcomes. The examples highlighted throughout this report are derived from the experiences of these two categories.

We also examined, though to a lesser extent, a third group of school systems located in developing economies in the Middle East and Latin America that are seeking to provide for growing populations (Bahrain, Brazil, Qatar, Saudi Arabia, and UAE). This group is currently embarking on ambitious improvement programs and, in the spirit of focusing on how others can learn from past experience, we have sought to understand the rationale of their reforms and how they are adapting approaches that have been successful elsewhere.

Our hope is that this report will help inform the international debate about how to improve the quality of schools and help chart the path to make future reforms more effective in improving the quality of schooling for all children everywhere.

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Introduction: inside the black box

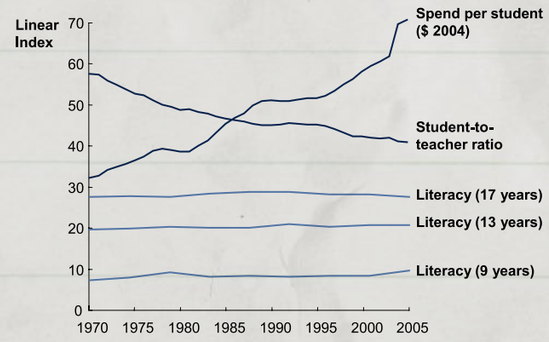
Despite substantial increases in spending and many well-intentioned reform efforts, performance in a large number of school systems has barely improved in decades. Few of the most widely supported reform strategies (for instance, giving schools more autonomy, or reducing class sizes) have produced the results promised for them. Yet some school systems consistently perform better and improve faster than others. We studied 25 of the world's school systems, including 10 of the top performers, to find out why.

SPENDING, REFORMS AND OUTCOMES

Between 1980 and 2005, public spending per student increased by 73 percent in the United States of America, after allowing for inflation. Over the same period, the U.S. employed more teachers: the student-to-teacher ratio fell by 18 percent and by 2005, class sizes in the nation's public schools were the smallest they had ever been. The federal government, state governments, school boards, principals, teachers, teacher unions, listed companies, non-profit organizations, and others launched tens of thousands of initiatives aimed at improving the quality of education in the nation's schools.

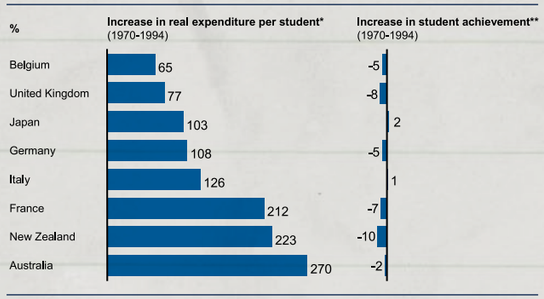
Actual student outcomes, however, as measured by the Department of Education's own national assessment program, stayed almost the same. Though there was some improvement in mathematics, the reading scores of 9 year-olds, 13 year-olds and 17 year-olds remained the same in 2005 as they had been in 1980 (Exhibit 2).

Exhibit 2: **U.S.: Teachers, spending and performance**



Source: National Centre for Education Statistics, NEAP, Hanushek (1998)

Exhibit 3: **Spending and outcomes in the OECD**



*Real expenditure, corrected for the Baumol effect using a price index of government goods and service; **Math and Science
Source: UNESCO, EFA Global Monitoring Report 2005, Pritchett (2004), Woessmann (2002), McKinsey

despite substantial increases in spending and many well-intentioned reform efforts, performance in a large number of school systems has barely improved in decades

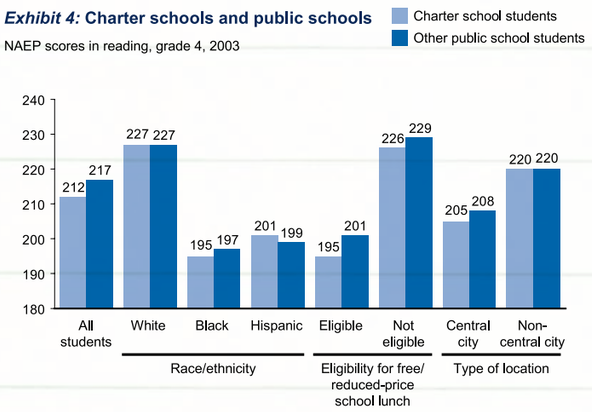
The United States was not the only country which had trouble improving its school system. In fact, almost every country in the OECD substantially increased its spending on education over the same period, in addition to launching multiple initiatives to spend this money more effectively. Yet very few of the school systems in the OECD achieved significant improvements in performance. One study based on the results of national and international assessments showed that in many school systems performance had either flat-lined or deteriorated (Exhibit 3).[3]

Yet many of these reform efforts appear well thought-out and far-reaching in their objectives, making their failure all the more perplexing. In England, for example, almost every aspect of the various reforms was reviewed and reorganized. They reformed "the funding of schools, the governance of schools, curriculum standards, assessment and testing, the inspection of quality, the role of local government, the role of national government, the range and nature of national agencies, the relationship of schools to communities, school admissions..."[4] Yet a report published by the National Foundation for Education Research in 1996 demonstrated that between 1948 and 1996, despite 50 years of reform, there had been no measurable improvement in standards of literacy and numeracy in English primary schools.[5]

3 Pritchett, Educational Quality and Costs: A Big Puzzle and Five Possible Pieces (2004) | 4 Barber, Journeys of Discovery (2005) | 5 NFER, Trends in Standards in Literacy and Numeracy in the UnitedKingdom (1997)

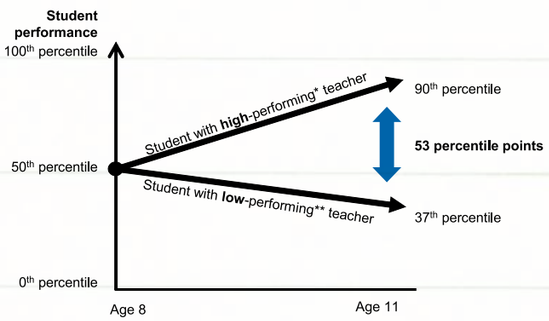
Exhibit 4: Charter schools and public schools

NAEP scores in reading, grade 4, 2003



Source: NCES, *America's Charter Schools: Results from the NAEP 2003 Pilot Study*; NCES, *A Closer Look at Charter Schools using Hierarchical Linear Modelling* (2006)

Exhibit 5: The effect of teacher quality



*Among the top 20% of teachers; **Among the bottom 20% of teachers
Analysis of test data from Tennessee showed that teacher quality effected student performance more than any other variable; on average, two students with average performance (50th percentile) would diverge by more than 50 percentile points over a three year period depending on the teacher they were assigned
Source: Sanders & Rivers *Cumulative and Residual Effects on Future Student Academic Achievement*, McKinsey

6 NAEP, America's Charter Schools: Results from the NAEP Pilot Study (2003)
7 Business Week, Bill Gates Gets Schooled, (2006)
8 Interview: New Zealand, May, 2006
9 Cross City Campaign, A Delicate Balance: District policies and Classroom Practice (2005)
10 OECD, Attracting Developing and Retaining Effective Teachers (2005).
11 Hanushek, The Evidence on Class Size (2003). Shapson, An experimental study on the effects of class size. Akerhielm, Does class size matter?
12 Ibid

it was naive to assume that classroom quality would improve just because we changed our structure

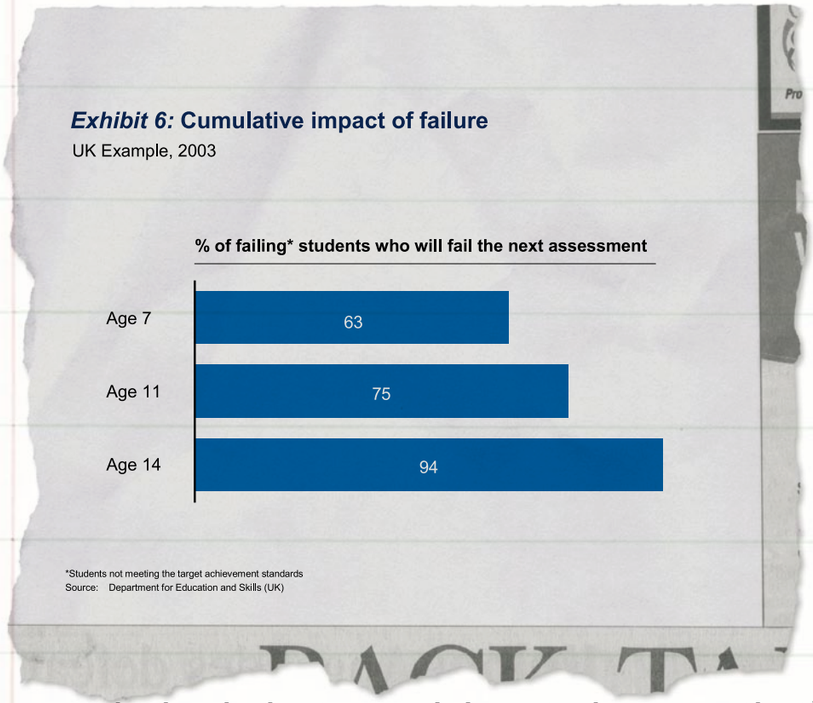
The reforms in the United States already mentioned were similarly ambitious and were concerned with far more than merely improving the student-teacher ratio. They also experimented with structural reforms, most prominently, in the decentralization of powers in school districts, smaller schools, and charter schools (schools given increased autonomy in exchange for increased accountability). Yet the results were disappointing. Though the best charter schools demonstrated significant improvements in student outcomes were possible, and certain chains of charter schools showed that reliable models could consistently deliver improvements in a succession of schools, in the aggregate, the results of the charter schools did not significantly outperform those of other schools. The National Assessment of Educational Progress (NAEP) went so far as to suggest that students in charter schools slightly underperformed their counterparts in public schools, even after allowing for student background (Exhibit 4).[6] Similarly, 'small schools' (new schools created by breaking up larger high schools) showed ''slightly improved results in reading, and worse results in math.''[7]

In New Zealand, policymakers overhauled the structure of the system, decentralizing powers to individual schools (which would be governed by elected boards), created two new independent regulatory bodies, and significantly reduced the role of central government in the school system. Five years on, in the mid-1990s, up to one third of schools were failing. One policymaker explained, ''It was naive to assume that classroom quality would improve just because we changed our structure.''[8]

A report by the Cross City Campaign, which analyzed similar reforms in Chicago, Milwaukee and Seattle, concluded that, ''The three districts had decentralized resources and authority to the schools in different ways and had undergone significant organizational changes to facilitate their ambitious instructional improvement plans. The unfortunate reality for the many principals and teachers we interviewed is that the districts were unable to change and improve practice on a large scale. And the evidence is indisputable: you can't improve student learning without improving instruction.''[9]

The one policy that almost every school system has pursued is in reducing class sizes. ''Class size reduction, facilitated by lower student-to-teacher ratios, has probably been the most widely supported and most extensively funded policy aimed at improving schools.''[10] Over the past five years every country in the OECD except for one has increased the number of its teachers relative to the number of its students.

Yet the available evidence suggests that, except at the very early grades, class size reduction does not have much impact on student outcomes. Of 112 studies which looked at the impact of the reduction in class sizes on student outcomes, only 9 found any positive relationship. 103 found either no significant relationship, or a significant negative relationship.[11] Even when a significant relationship was found, the effect was not substantial. More importantly, every single one of the studies showed that within the range of class sizes typical in OECD countries, ''variations in teacher quality completely dominate any effect of reduced class size''.[12] Moreover reducing class sizes had significant resource implications: smaller classes



ten years ago, seminal research based on data from Tennessee showed that if two average eight-year-old students were given different teachers - one of them a high performer, the other a low performer - their performances diverge by more than 50 percentile points within three years

meant that the school systems needed more teachers, which in turn meant that, with the same level of funding, they had less money per teacher. It also meant that because the school system requires more teachers to achieve smaller class sizes it could become less selective about who could be a teacher.[13]

FOCUSING ON TEACHER QUALITY

The available evidence suggests that the main driver of the variation in student learning at school is the quality of the teachers. Ten years ago, seminal research based on data from Tennessee showed that if two average eight-year-old students were given different teachers – one of them a high performer, the other a low performer – their performance diverge by more than 50 percentile points within three years (Exhibit 5).[14]
By way of comparison, the evidence shows that reducing class sizes from 23 to 15 students improves the performance of an average student by eight percentile points at best.[15] Another study, this time in Dallas, shows that the performance gap between students assigned three effective teachers in a row, and those assigned three ineffective teachers in a row, was 49 percentile points.[16] In Boston, students placed with top-performing math teachers made substantial gains, while students placed with the worst teachers regressed – their math got worse.[17] Studies that take into account all of the available evidence on teacher effectiveness suggest that students placed with high-performing teachers will progress three times as fast as those placed with low-performing teachers.[18] In every school system visited during the benchmarking, head teachers reported variations in the amount of learning that occurred in different classes, and those variations depended mainly on the quality of teaching in different classrooms. The negative impact of low-performing teachers is severe, particularly during the earlier years of schooling. At the primary level, students that are placed with low-performing teachers for several years in a row suffer an educational loss which is largely irreversible. In some systems, by age seven, children who score in the top 20 percent on tests of numeracy and literacy are already twice as likely to complete a university degree as children in the bottom 20 percent. In England, students that were failing at age 11 had only a 25 percent chance of meeting the standard at age 14. By age 14, the chances that a failing student would graduate with the expected minimum set of school-leaving qualifications had fallen to just six percent (Exhibit 6). Taken together, all the evidence suggests that even in good systems, students that do not progress quickly during their first years at school, because they are not exposed to teachers of sufficient calibre, stand very little chance of recovering the lost years.

13 The most optimistic estimates of the effectiveness of reducing class size on student achievement suggest that a reduction in class size from 23 to 15 in the early grades leads to an improvement in performance equivalent to 0.2 standard deviations. | 14 Sanders & Rivers, Cumulative and Residual Effects of Teachers on Future Student Academic Achievement (1996). | 15 Scientific American, Does Class Size Matter (2001). | 16 Teacher Effects on Student Achievement (1997) 17 Kati Haycock, Achievement in America: Can we close the gaps (2006)

STRIKING DIFFERENCES, FUNDAMENTAL SIMILARITIES

Yet some school systems do perform better and improve faster than others. Singaporean students score top in the TIMSS assessment (an international examination in Mathematics and Science) despite the fact that Singapore spends less on each student in primary education than almost any other developed country. In Finland, students do not start school until they are seven years old, and attend classes for only four or five hours each day during their first two years of schooling. Yet by age 15, they score top in the world in tests of mathematics, science, reading and problem solving, a full 50 points ahead of their peers in neighbouring Norway. In the United States, Boston increased the number of students meeting the MCAS standard from 25 percent to 74 percent in Math, and from 43 percent to 77 percent in English, in just six years.

Clearly there are inevitable differences between schools: policy makers in Seoul, Helsinki and Chicago operate in completely different cultural and political contexts, and confront different challenges. Some systems appear to be polar opposites: the Netherlands attributed much of their success to a highly devolved governance system; Singapore says it succeeded because of strong central control; England's system contains 23,000 schools, Boston's just 150.

Yet there were also fundamental similarities. We found that high-performing school systems, though strikingly different in construct and context, maintained a strong focus on improving instruction because of its direct impact upon student achievement. To improve instruction, these high-performing school systems consistently do three things well:

- They get the right people to become teachers (the quality of an education system cannot exceed the quality of its teachers).
- They develop these people into effective instructors (the only way to improve outcomes is to improve instruction).
- They put in place systems and targeted support to ensure that every child is able to benefit from excellent instruction (the only way for the system to reach the highest performance is to raise the standard of every student).

Acting on these drivers requires that changes and improvements be made in other parts of the system, ranging from funding structures to governance and incentives. These systems all ensure that they put in place the necessary foundational conditions, such as rigorous standards and assessments, clear expectations, differentiated support for teachers and students, and sufficient funding, facilities and other core resources. So, although it is true that the system's context, culture, politics and governance will determine the course which system leaders must follow, the cumulative experience of the high-performing systems we studied indicates that focusing on these three drivers is essential for improving student outcomes and, more importantly, that reform efforts which fail to address these drivers are unlikely to deliver the improvements in outcomes that system leaders are striving to achieve. The remainder of this report explores these drivers in more detail.

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"The quality of an education system cannot exceed the quality of its teachers"

The top-performing school systems consistently attract more able people into the teaching profession, leading to better student outcomes. They do this by making entry to teacher training highly selective, developing effective processes for selecting the right applicants to become teachers, and paying good (but not great) starting compensation. Getting these essentials right drives up the status of the profession, enabling it to attract even better candidates.

The quality of a school system rests on the quality of its teachers. The evidence that getting the right people to become teachers is critical to high performance is both anecdotal and statistical. A South Korean policymaker is explicit about the importance of getting good people into teaching: ''The quality of an education system cannot exceed the quality of its teachers''.[19] In the United States, studies show that ''a teacher's level of literacy, as measured by vocabulary and other standardized tests, affects student achievement more than any other measurable teacher attribute.''[20] While it is a matter of debate, some studies have found that teachers working for Teach For America (a program which targets graduates of top universities) get significantly better outcomes from their students than do other teachers. This is the case despite the fact that their teachers have only a short period of teacher training, work in the toughest schools, and generally have no prior experience (teacher effectiveness increases dramatically during the first five years of teaching).[21]

The top-performing systems we studied recruit their teachers from the top third of each cohort graduate from their school system: the top 5 percent in South Korea, the top 10 percent in Finland, and the top 30 percent in Singapore and Hong Kong. In the United States, programs in rapidly improving systems, such as the Boston Teacher Residency, the New York Teaching Fellows, and the Chicago Teaching Fellows do the same thing, targeting the graduates of top universities.

Conversely, lower-performing school systems rarely attract the right people into teaching. The New Commission on the Skills of the American Workforce observes that, ''We are now recruiting our teachers from the bottom third of high-school students going to college ... it is simply not possible for students to graduate [with the skills they will need]... unless their teachers have the knowledge and skills we want out children to have.''[22] A Middle Eastern policymaker a region where teachers have historically been recruited from the lowest third of high-school graduates is succinct: ''faakid ashay la yua'tee'' (''One cannot give what one does not have'').[23]

CULTURE, POLICY AND THE STATUS OF TEACHING

In all of the systems we studied, both policymakers and commentators frequently attributed their success in attracting talented people into teaching (or the lack thereof) to variables seemingly outside the control of the policymaker: history, culture, and the status of the teaching profession. In particular, outsiders often attribute the success of the Asian school systems we studied to the dual blessing of a high cultural premium on education and traditional (Confucian) respect for teachers.

Despite this common belief, our benchmarking suggests that the same broad policies are effective in different school systems irrespective of the cultural context in which they are applied. School systems in Europe and America which have made the same policy choices as Asian school systems attract the same quality of applicants, or better: the Chicago Teaching Fellows and Boston Teacher Residency, for instance, attract the same calibre of graduate as Singapore or Hong Kong. Some school systems have made strategic policy interventions that have quickly transformed the status of the teaching profession: England has made teaching the most popular profession among undergraduates and graduates in just five years.[24] Even in systems where the teaching profession enjoys a traditionally high status, policy still had a massive impact on quality. Finland has lifted the status of its primary school teachers relative to

19 Interview: South Korea, 2007 | 20 NCTQ, Increasing the Odds: How good policies can yield better teachers | 21 Decker, Mayer, Glazerman, The Effects of Teach for America: Findings from a National Evaluation (2004) | 22 NCEE, Tough Choices or Tough Times (2007) | 23 Interview: GCC, May 2006 | 24 Training and Development Agency for Schools (11 August 2005)

those in secondary schools by varying salaries by as little as €100 a month. In South Korea there is a substantial difference between the status of primary teachers and secondary teachers: this is entirely attributable to government policy in controlling the supply in teacher training places for primary school teachers. In each system we studied the evidence suggests that policies have a strong impact on status, irrespective of the cultural context in which they are applied.

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Looking at the various systems as a whole, there are common strategies and best practices for attracting strong candidates into the teaching profession. England has led the way in using marketing and recruitment techniques taken from business to increase the supply of quality applicants. Most top-performing school systems remove obstacles to entry into the profession by creating alternative pathways for experienced hires. Most of the systems also recognise that they will make mistakes, and have developed processes to remove low-performing teachers from the classroom soon after appointment.

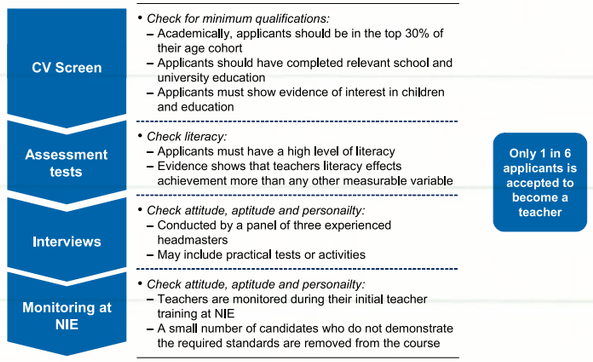
Almost universally, the top school systems do two things: they have developed effective mechanisms for selecting teachers for teacher training, and they pay good starting compensation. These two things have a clear and demonstrable impact on the quality of people who become teachers. These same features are frequently absent in lower-performing systems.

MECHANISMS FOR SELECTING TEACHERS FOR TEACHER TRAINING

The top-performing school systems have more effective mechanisms for selecting people for teacher training than do the lower-performing systems. They recognize that a bad selection decision can result in up to 40 years of poor teaching. These mechanisms acknowledge that for a person to become an effective teacher they need to possess a certain set of characteristics that can be identified before they enter teaching: a high overall level of literacy and numeracy, strong interpersonal and communications skills, a willingness to learn, and the motivation to teach.[25] The selection procedures are therefore designed to test for these skills and attributes, and select those applicants that possess them. Singapore's and Finland's selection procedures are among the most effective. Both these systems place a strong emphasis on the academic achievement of candidates, their communication skills, and their motivation for teaching. Singapore has implemented a single, state-wide selection process that is managed jointly by the Ministry of Education and the National Institute for Education (Exhibit 7).

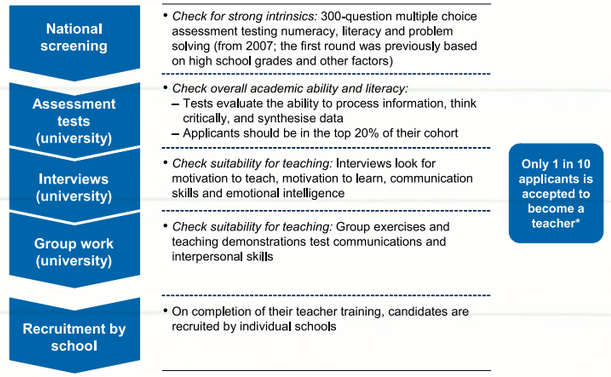
Finland has introduced a national first-round in its selection process which, from 2007 onwards, will consist of a multiple-choice examination designed to test numeracy, literacy and problem-solving skills.[26] The top-scoring candidates are then passed through to second round in the selection procedure which is run by the individual universities. In this round the applicants are tested for their communication skills, willingness to learn, academic ability, and motivation for teaching. Upon graduation from teacher training, the prospective teachers nevertheless need to pass yet further tests run by the individual schools to which they apply for teaching positions (Exhibit 8).

Exhibit 7: **Singapore: selection of teachers**



Source: Interviews: Ministry of Education (Singapore)

Exhibit 8: **Finland: selection of teachers**



* Varies by university
Source: Attracting, Developing and Retaining Teachers: Background report for Finland, Interviews, McKinsey

the top-performing school systems have more effective mechanisms for selecting people for teacher training than do the lower-performing systems

25 Allington, Johnston, What do we know about effective fourth grade teachers and their classrooms (2000). Interviews in Singapore, South Korea, and Hong Kong | 26 Before 2007, the first round of the recruitment process had been based mainly on achievement at secondary school.

As important as it is to get the selection process right, it is equally important to make sure that the selection process happens at the right point in time. In every system we studied, teachers begin their professional careers with a period of teacher training. In most cases this consisted of either a three- or four-year undergraduate program, or a one-year postgraduate program following an undergraduate degree in a subject other than education. School systems therefore have two options for selecting teachers (Exhibit 9).

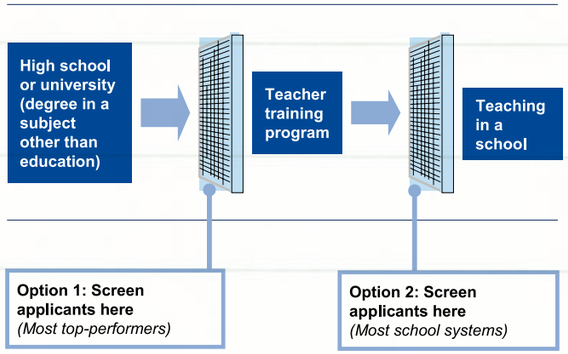
Option 1: The first model selects people before they start their teacher training and limits places in the training program to those who are selected.

Option 2: The second model leaves the selection process until after the prospective teachers have graduated from teacher training and then selects the best graduates to become teachers.

While almost every school system in the world uses the second option, most of the top-performers use variations on the first.

Failing to control entry into teacher training almost invariably leads to an oversupply of candidates which, in turn, has a significant negative effect on teacher quality. In one system we benchmarked, of 100 people that applied to teacher training, only 20 became teachers. Of this 100, 75 received offers for teacher training places, indicating that it is relatively easy to get into the teacher training program. However, upon graduation, because of over-supply, they struggle to find jobs as teachers, making the course less appealing to the more able students. In such conditions teacher training became an option for students who had few other options available to them.

Exhibit 9: **Screening applicants**

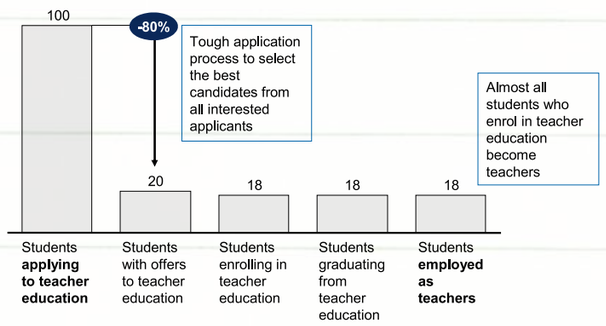


Source: OECD *Attracting Developing and retaining effective teachers;* interviews, McKinsey

Exhibit 10: **Singapore: Recruitment into teaching**

ESTIMATE

Ratio of applicants for teacher education to teachers employed
2005



Source: Interviews; McKinsey

27 A full salary is paid during training on one-year programs. On longer programs, a salary is only paid during the final part of the course

As the quality of people on the courses begins to drop, so does the quality of the courses themselves, because the quality of any classroom experience is highly dependent on the quality of the people in the classroom. The programs also suffer from having too many students: if the program had selected just the number of people needed to fill the vacant teaching posts, they would have been able to spend almost three times as much on training each student. All told, Option 2 tends to make teacher training a low-status program, which in turn makes teaching a low-status profession. Once this has been allowed to happen, teaching becomes stuck in a downward spiral.

Conversely, the top-performing systems select for entry into the teacher training programs. They do so either by controlling entry directly, or by limiting the number of places on teacher training courses, so that supply matches demand. In Singapore, applicants are screened, tested and selected before they enter teacher training (Exhibit 10). They are then formally employed by the Ministry of Education and paid a salary during their training.[27] This means that teacher training is not an option for those with few other options. Making teacher training selective in this manner makes it attractive to high performers. It also means that Singapore can, and does, spend more on teacher training (per student) than other education systems because there are fewer people in its courses. All of this makes teacher training an attractive and high-status course in Singapore and this, in turn, makes teaching an attractive and high-status profession.

Several other school systems have created similar structures to those seen in Singapore. Finland limits the number of places on teacher training so that the supply of teachers matches demand, and only allows universities to select candidates who have passed a national screening process. Boston, Chicago and New York have a somewhat different approach in that they control entry

into teacher training only for prospective teachers on their Fellows and Residency programs (rather than for all prospective teachers). For these programs candidates are selected through a system-wide admissions process and guaranteed a teaching position in a school before they enter teacher training. Both programs report that the calibre of their candidates is much higher than the cities' average intake. England focuses on limiting the funding for teacher training to manage supply, and ensures that all training providers meet certain general standards for the selection of the students in their courses.

A compelling example of how the control of entry to teacher training programs can have a substantial positive impact on the quality of people who become teachers is seen in the contrast between how South Korea's system treats its primary school and secondary school teachers.

In order to become a primary teacher it is necessary for the prospective teacher to first complete a four-year undergraduate degree in education at a National Education University. Places on these courses are limited, to ensure that the supply of teachers meets demand. Entry is by merit. Admission to all first degree courses in South Korea is based on the results of the national College Entrance Exam; the cut-off score for teacher training courses requires that students should be in the top five percent of their academic cohort. The courses are therefore highly selective and the graduates of these courses are very likely to find employment as a teacher. This ensures that the attractiveness, status and quality of the courses remain high.

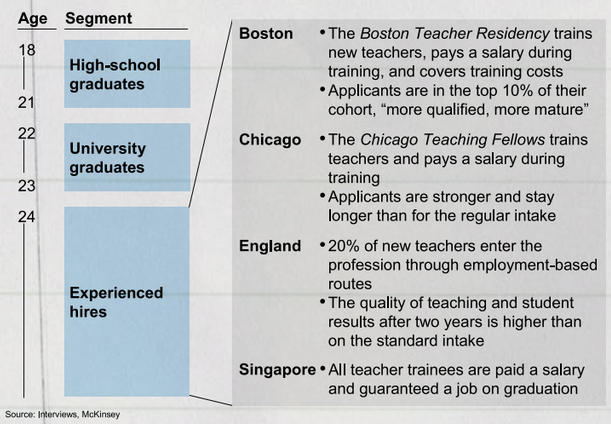
South Korea takes a very different approach to training its secondary school teachers, however, resulting in very different outcomes. In contrast to its careful matching of supply with demand for primary school teachers, the selection of secondary school teachers are not subjected to the same approach. Instead of facing restrictions in entry to training courses, they are free to complete their teacher training at one of more than 350 competing providers. Graduates then apply for jobs at one of the 16 provincial or metropolitan offices of education. As a result, there is significant oversupply: South Korea produces five times as many graduates each year as is required by the secondary school system. This problem has been compounded over time and the number of applicants now exceeds the number of places by a factor of eleven (in December 2005 there were 59,090 applications for 5,245 teaching positions). As a result, in contrast to situation for primary school teaching, the status and attractiveness of secondary school teaching has declined in South Korea, making it unattractive to high-performers.

Selective entry has clear benefits. Broadly, there are three different mechanisms that school systems use to make entry into teacher training more selective and to match the supply of teacher training with demand.

- **System-wide recruitment processes:** In Singapore and Finland, to different degrees, the state controls the entire process for the selection of students for teacher training. In Singapore, prospective teachers are selected and employed by the Ministry of Education before entering teacher training. In Finland, there is a two-stage process. In the first stage, prospective teachers are subjected to a nation-wide screening process. In the second stage, the individual universities select their own candidates from those that have met the criteria in the first stage. Places in teacher training courses in both countries are limited so that the supply of graduates matches demand.
- **Controlling places through funding:** In Hong Kong, England and South Korea's primary school system, the government uses its control of funding to limit the number of students (and the supply of teacher training places). This approach assumes that once supply is restricted, universities will implement rigorous selection procedures to ensure that the best applicants are selected. This approach probably functions best in England, which defines the competencies for new teachers, has a rigorous quality assurance system, and puts in place penalties for under-performing training providers. This ensures that the training providers have the right incentives to implement thorough selection processes.
- **Alternative pathways:** Where the system leaders can not influence the university selection procedures or funding, the systems have created alternative entry paths that enable them to select suitable candidates before their entry into training. The Boston Teacher Residency, Chicago Teaching Fellows, and New York Teaching Fellows programs all follow this approach, guaranteeing those selected a teaching position before they enter the training program. These districts have entered into agreements with the local schools and universities to provide training for the candidates they select.

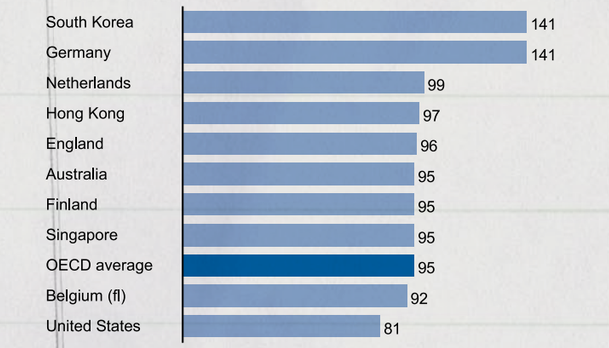
In addition to developing alternative ways of recruiting fresh graduates, top-performing systems have also found ways to recruit more experienced graduates. Typically, teacher training requirements create barriers to recruiting such people. Applicants to teaching who have already completed their university studies and started work generally have to undertake a year of training, during which they lose a year's earnings, as well as often having to bear the cost of their course in addition. This makes entry into the profession unattractive to experienced hires, particularly those with families or other financial commitments. Opening up alternative routes

Exhibit 11: Programs for experienced hires



Source: Interviews, McKinsey

Exhibit 12: Starting salaries in school systems



Source: OECD *Education at a glance 2005*, Interviews, McKinsey

28 Interview: Finland, March, 2007

all of the top-performing systems we benchmarked (except for one) paid starting salaries that were at or above the OECD average, relative to their GDP per capita

into teaching in which entrants are relieved of this financial burden increases significantly the pool of potential applicants into the profession. Most systems have also found that the quality of applicants on these programs is higher than otherwise (Exhibit 11).

England has probably diversified its recruitment process the most, having developed more entry points into teaching than any other system in an attempt to maximise recruitment. By 2006 there were 32 different ways to enter the teaching profession in England, though the expectations of the skills, knowledge, and the behaviours teachers should demonstrate by the time they had completed their training is the same for each route.

Most top-performing systems recognise that no selection process is perfect, and so implement procedures to ensure that the lowest-performing teachers can, if necessary, be removed from the classroom after appointment to their teaching position, based on the evidence of their classroom practice. In the rapidly improving systems of Boston and Chicago, teachers are not made permanent until they have been teaching for three or four years, respectively. This allows the district to remove them from their position if they prove unsuitable. In England and New Zealand teachers do not gain their teaching licences until after they have completed one or two years teaching, respectively, and have gained satisfactory reviews from their principals. In New Zealand, the Teachers' Council makes a second, follow-up evaluation of 10 percent of all new teachers so as to ensure the evaluations undertaken by the school principals meet the right standard.

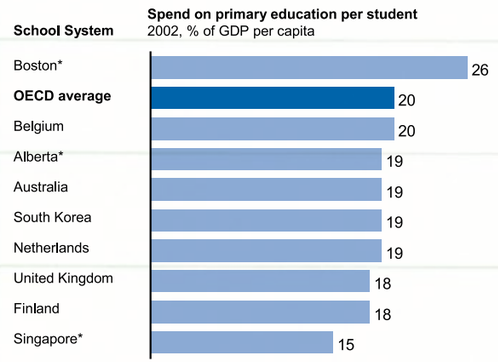
GOOD STARTING COMPENSATION

The other essential ingredient for getting the right people to become teachers is to provide good starting pay. All of the top-performing systems we benchmarked (except for one) paid starting salaries that were at or above the OECD average, relative to their GDP per capita. What is interesting, however, is that the range of starting salaries offered by the top performers is very narrow: most systems pay a starting salary between 95 percent and 99 percent of GDP per capita (across the OECD as a whole, starting salaries range from 44 percent to 186 percent of GDP per capita) (Exhibit 12).

A good salary is not necessarily the main or only motivation for teaching, of course. Surveys show that most people who enter the teaching profession do so for a range of reasons, the foremost of which is the desire to help a new generation succeed in a world in which skills and knowledge are crucial to success. In fact, salary is rarely stated to be one of the most important reasons for becoming a teacher, even in the systems where compensation is good; in the words of one Finnish teacher, ''None of us do this for the money''.[28] However, the surveys also show that unless school systems offer salaries which are in-line with other graduate starting salaries, these same people do not enter teaching.

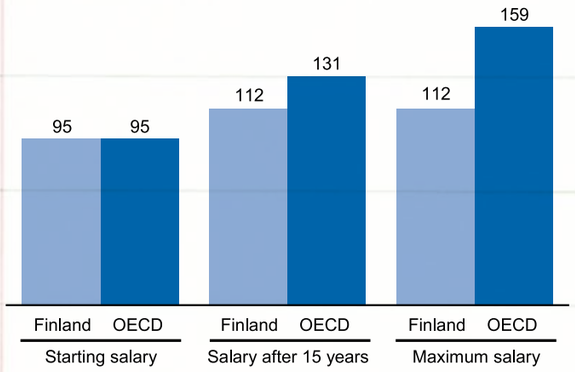
This has important implications for policy. Top-performing systems have found that while raising salaries in line with other graduate salaries is important, raising them above the market average for graduates does not lead to substantial further increases in the quality or quantity of applicants. In England, where salaries had been slightly

Exhibit 13: **Top performers often spent less on education than the OECD average**



* Estimate
Source: OECD *Education at a glance 2005*, Interviews, McKinsey

Exhibit 14: **Salaries in Finland and the OECD**
Primary teacher salary as a % of GDP per capita



Source: OECD *Education at a glance 2005*

below average graduate salaries, increasing teacher salaries by a small amount (10 percent) resulted in a substantial rise in applications (30 percent); whereas, in Switzerland, where salaries were already very high (116 percent of GDP per capita), further increases in salary had little impact on the number or quality of applicants to teaching.[29] This might explain why countries which pay very high starting salaries (in Europe, Spain, Germany and Switzerland pay the highest starting salaries relative to GDP) have not gained improved outcomes as a result. Only in South Korea, where salaries are exceptionally high (not only do they start high, but they rise to a maximum that is two-and-a-half times higher than the average maximum teacher salary in the OECD)[30] do higher salaries appear to have resulted in an increase in the quality of people becoming teachers.

Clearly, paying higher starting salaries places a financial burden on the school system. Broadly, there are three strategies for balancing the cost of paying higher starting salaries:

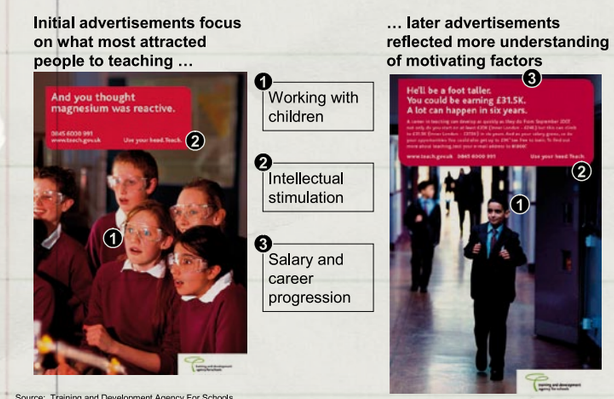
- **Spending more:** Boston Public Schools pay the highest starting salaries in Massachusetts. In order to do so, it spends more: its annual spending on primary education per student is equivalent to 26 percent of GDP per capita, significantly above the OECD average. However, most of the top performers spent less on their school systems than the OECD average – they have found other ways to fund higher starting salaries (Exhibit 13).
- **Frontloading compensation:** Finland, the Netherlands, New Zealand, Australia and England, in effect, frontload their compensation: the starting salaries are good, but relative to other OECD countries, subsequent increases in compensation are small.[31] In Finland, the difference between the average starting salary and the maximum teacher salary is just 18 percent (Exhibit 14). By paying good starting salaries, Finland attracts strong performers into the profession. Teachers who are committed to teaching stay despite the salary; others who are less committed leave, as their compensation decreases relative to their peers in other professions. Systems which frontload compensation succeed because of two factors: first, salary progression is less important in the decision to become a teacher than starting salary and, secondly, teacher retention is generally not correlated strongly to salary progression.

Though restructuring salary scales in order to frontload compensation is likely to prove difficult to achieve in most school systems, it is not impossible. One of the top-performers, the Netherlands, has done exactly this. Between 1990 and 1997, the Netherlands increased its monthly starting salary for teachers from €1,480 to €2,006, effectively bringing teachers' starting salaries into line with the private sector.[32] The Netherlands also reduced the time it takes to reach the top of the salary schedule from 26 years to 18 years, with the eventual aim of reducing it to 15 years. Similarly, Alberta has been increasing its starting salaries more quickly than its maximum salary, and has reduced the difference between the top and bottom of its scale from 81 percent to 70 percent since 2001. Some of the school systems use other mechanisms to frontload compensation, such as paying salaries or bursaries during teacher training (Boston, England, Chicago, New York, Singapore) or offering signing bonuses to new teachers (England).

- **Increasing class size:** South Korea and Singapore employ fewer teachers than other systems; in effect, this ensures that they can spend more money on each teacher at an equivalent funding level. Both countries recognise that while class size has relatively little impact on the quality of student outcomes (see above), teacher quality does. South Korea's student-to-teacher ratio is 30:1, compared to an OECD average of 17:1,[33] enabling it to in effect double teacher salaries while maintaining the same overall funding level as other OECD countries (teacher salaries are

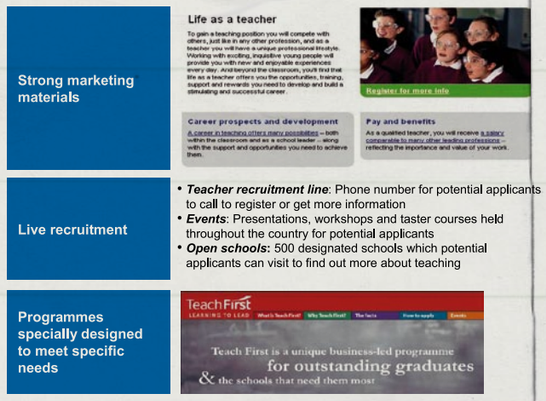
29 OECD, Attracting Developing and Retaining Effective teachers, (from Dolton, Wolter, Denzler) p. 70 | 30 Starting primary teacher salaries in South Korea are 141 percent of GDP per capita, rising to 389 percent of GDP per capita (compared to OECD averages of 95 percent and 159 percent of GDP per capita respectively) (2003). | 31 The increase in the maximum salary over the starting salary in high-performing systems is as follows: an increase of 18 percent in Finland, 45 percent in New Zealand and the Netherlands, 46 percent in England, and 47 percent in Australia (average across all states and territories), compared to an OECD average of 70 percent. Source: OECD, Education at a Glance 2005 | 32 Attracting Developing and Retaining Teachers: Country Report for the Netherlands, pp. 36-37 | 33 2003 (OECD, Education at a Glance 2005)

Exhibit 15: **England: TDA advertising strategy**



Source: Training and Development Agency For Schools

Exhibit 16: **TDA's promotion of teaching**



Source: Training and Development Agency For Schools

the main budget item in any school system budget, typically representing 60-80 percent of spending). Singapore has pursued a similar strategy, but has also frontloaded compensation. This combination enables it to spend less on primary education than almost any OECD country and yet still be able to attract strong candidates into the teaching profession. In addition, because Singapore and South Korea need fewer teachers, they are also in a position to be more selective about who becomes a teacher. This, in turn, increases the status of teaching, making the profession even more attractive.

THE IMPORTANCE OF TEACHER STATUS

In all of the systems we studied, the ability of a school system to attract the right people into teaching is closely linked to the status of the profession. In Singapore and South Korea, opinion polls show that the general public believe that teachers make a greater contribution to society than any other profession. New teachers in all of the systems studied consistently reported that the status of the profession is one of the most important factors in their decision to become a teacher.

In all school systems there are powerful feedback loops associated with the status of the teaching profession. Once teaching became a high-status profession, more talented people became teachers, lifting the status of the profession even higher. This is particularly apparent in Finland and South Korea, where historically strong teaching forces have given the profession a high status in the eyes of the general public, enabling them to attract further high-calibre recruits, thereby perpetuating this status. Conversely, where the profession has a low status, it attracts less-talented applicants, pushing the status of the profession down further and, with it, the calibre of people it is able to attract. The power of these feedback loops suggests that seemingly small policy changes can sometimes have a massive impact on the status of the teaching profession.

In all of the school systems the status of teaching is driven mainly by policy, and policies can change its status very quickly. There are two dominant approaches for changing the status of the profession:

- **Separate branding:** Boston, Chicago, Teach First and Teach For America have all created distinct brands with a separate status associated with them. For instance, Teach First and Teach For America have successfully branded themselves as programs distinct from mainstream teaching: ''Teach First succeeded in making teaching acceptable among a group who had perceived it as having low status by constructing the participants as an elite group.''[34]
- **System-wide strategies:** Singapore and England have both implemented carefully constructed marketing strategies, linked to recruitment programs, which have sought to raise the status of the profession. In both cases, the systems leveraged best-practices from business. The marketing was backed by tangible improvements to starting conditions, particularly increased salaries.

The Training and Development Agency for Schools (TDA) in England tracked the response to its marketing campaigns and, based on the feedback it was getting, carefully modified its approach (Exhibit 15).

The TDA had been given the task of raising the quality and quantity of applicants into teaching. To do this it chose to employ best-practice marketing and recruiting techniques used in business: it carefully segmented its target audience, tracked individual candidates through a sophisticated relationship management system, scripted key interactions between its representatives and prospective teachers, and got feedback through surveys and market research (Exhibit 16). It also supported two differentiated

34 IPSE, An evaluation of innovative approaches to teacher training on the Teach First Programme (2006)

programs to appeal to different segments of the market. Its Teach First[35] program targets top university graduates, while FastTrack is designed to attract and develop potential school leaders.

In addition to changing how the teaching profession is perceived externally, most systems have found that the perception of the teaching profession is linked to the perceived level of education and training that teachers are required to undertake to become teachers.

- **Emphasis on development:** Policymakers in Finland have raised the status of the teaching profession by requiring that all teachers possess a master's degree. Singaporean policymakers have achieved a similar result by ensuring the academic rigour of their teacher education courses, as well as by providing all teachers with the entitlement of 100 hours fully-paid professional development training each year.

CONCLUSION

The debate about how to improve the world's school systems has all too often been guided by a set of beliefs that have little basis in fact: namely that it is possible to make substantial long-term improvement to the school system without fundamentally raising the quality of people who enter the teaching profession; important variables, such as the status of the teaching profession, are largely outside the control of policymakers; attracting better people into teaching will always require school systems to pay ever higher salaries; making teaching the preferred career choice for large numbers of top-performers is an unattainable, or at best, distant goal. The experiences of the high-performing school systems suggest that all these beliefs fail the test of critical examination.

School systems, from Seoul to Chicago, from London to New Zealand, and from Helsinki to Singapore, show that making teaching the preferred career choice depends less on high salaries or 'culture' than it does on a small set of simple but critical policy choices: developing strong processes for selecting and training teachers, paying good starting compensation, and carefully managing the status of the teaching profession. Above all, the top performing systems demonstrate that the quality of an education system depends ultimately on the quality of its teachers.

35 Teach First targets graduates of the top universities in the United Kingdom, asking them to spend two years teaching. It then supports them in getting other jobs in the private sector after they had finished two years teaching. Not only are its teachers highly successful, but 47 percent of the first cohort decided to stay in teaching after the end of the two-year program.

"The only way to improve outcomes is to improve instruction"

The top-performing school systems recognise that the only way to improve outcomes is to improve instruction: learning occurs when students and teachers interact, and thus to improve learning implies improving the quality of that interaction. They have understood which interventions are effective in achieving this – coaching classroom practice, moving teacher training to the classroom, developing stronger school leaders, and enabling teachers to learn from each other – and have found ways to deliver these interventions throughout their school system.

The quality of the outcomes for any school system is essentially the sum of the quality of the instruction that its teachers deliver. ''You could define the entire task of [a school] system in this way: its role is to ensure that when a teacher enters the classroom he or she has the materials available, along with the knowledge, the capability and the ambition to take one more child up to the standard today than she did yesterday. And again tomorrow.''[36] Ensuring that teachers have that knowledge and capacity is not easy. Delivering excellent instruction requires teachers to develop a highly sophisticated set of skills. Alberta's standards for effective teaching, for instance, list more than 30 variables that teachers are expected to consider when deciding which instructional techniques to use in any given situation. By age nine, ''the achievement gap within a single class may span five or more years of schooling.''[37] Teachers need to be able to assess precisely the strengths and weaknesses of each individual student they teach, select the appropriate instructional methods to help them to learn, and deliver instruction in an effective and efficient manner.

The first part of the challenge is to define what great instruction looks like. That task – developing the curriculum and its associated pedagogies – is difficult and controversial from an educational perspective, yet relatively more straightforward from a system management perspective: the challenge is broadly one of finding the best educators and giving them the space to debate and create a better curriculum and pedagogy.

The second part of the challenge in instruction is, at least from a system management perspective, much more complex: giving thousands of teachers (in some cases hundreds of thousands of teachers) the capacity and knowledge to deliver that great instruction reliably, every day, across thousands of schools, in circumstances that vary enormously from one classroom to the next – and all this with very little oversight.

All of the rapidly improving systems recognise the complexity and primacy of this second challenge, and focus much of their reform effort on developing and implementing successful strategies to improve classroom instruction. One policymaker in Boston explained that, ''The three pillars of the reform were professional development, professional development, and professional development... We aligned everything – resources, organization, people – with professional

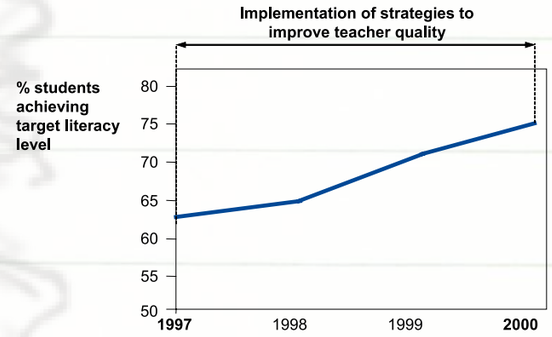
you could define the entire task of (a school) system in this way: its role is to ensure that when a teacher enters the classroom he or she has the materials available, along with the knowledge, the capability and the ambition to take one more child up to the standard today than she did yesterday. And again tomorrow.

36 Barber, Journeys of Discovery (2005) | 37 Fullan, Hill, Crevola, Breakthrough (2006)

development. Five percent of the district's budget went to professional development, and 80 percent of that went to teachers... The only way to improve outcomes is to improve instruction.''[38] It is not just improving systems that recognise the primacy of this challenge: the top-performing systems do so too. Singapore used its National Institute of Education to deliver high-quality professional development to its teaching workforce: ''You can have the best curriculum, the best infrastructure, and the best policies, but if you don't have good teachers then everything is lost... We provide our teachers with 100 hours of professional development each year... If you do not have inspired teachers, how can you have inspired students?''[39]
In England too, reforms focused on improving classroom practice. As one policymaker reflected, ''Between 1988 and 1998, [many things] were changed, changed utterly, sometimes twice or three times. And then I'd go into a primary school classroom in 1998 and I'd think to myself – this is very like 1988... Since 1998 we have changed that. We have taken reform inside the classroom.''[40]

Certain interventions for improving instruction had a dramatic impact on student outcomes. In just six years, Boston increased the number of its students meeting the MCAS standard from 25 percent to 74 percent in Math, and from 43 percent to 77 percent in English. In England, where there had been little or no improvement in student outcomes in literacy and numeracy for nearly half a century, the government rolled out new national training programs which employed best-practice training techniques. In just three years, they increased the number of students meeting the target standards in literacy from 63 percent to 75 percent (Exhibit 17).

Exhibit 17: **England: impact of the National Literacy Strategy**



Source: DoE

NECESSARY BUT NOT SUFFICIENT

Top-performing systems are relentless in their focus on improving the quality of instruction in their classrooms. Yet this focus on instruction, though a necessary condition, is in itself insufficient to bring about improvement. In order to improve instruction, school systems needed to find ways to change fundamentally what happens in the classrooms. At the level of individual teachers, this implies getting three things to happen:

- Individual teachers need to become aware of specific weaknesses in their own practice. In most cases, this not only involves building an awareness of what they do but the mindset underlying it.
- Individual teachers need to gain understanding of specific best practices. In general, this can only be achieved through the demonstration of such practices in an authentic setting.
- Individual teachers need to be motivated to make the necessary improvements. In general, this requires a deeper change in motivation that cannot be achieved through changing material incentives. Such changes come about when teachers have high expectations, a shared sense of purpose, and above all, a collective belief in their common ability to make a difference to the education of the children they serve.

Many of the reforms we studied were unable to deliver substantial improvements largely because they did not get all of these three things to happen at the same time. While certain reforms increased accountability or introduced performance-based incentives to improve motivation, they did so without providing teachers with the awareness of their weaknesses or knowledge of best practices.

There is plenty of evidence to suggest that without all three things in place, change will be limited. For instance, studies which evaluated the effect of performance-based pay on student outcomes in North Carolina, Denver and Texas show that although student outcomes might improve to a certain extent in some schools as a result, these gains were not substantial.[41] Reforms that expose teachers to best practices through workshops or written materials but that do so without making this knowledge precise enough for teachers to understand how to apply it in their own classroom also fail: ''The notion that external ideas by themselves will result in changes in the classroom and school is deeply flawed as a theory of action.''[42] Despite the evidence, and the fact that almost every other profession conducts most of its training in real-life settings (doctors and nurses in hospitals, clergy in churches, lawyers in courtrooms, consultants with clients) very little teacher training takes place in the teacher's own classrooms, the place in which it would be precise and relevant enough to be the most effective.

38 Interview: Boston, January, 2007 | 39 Interview: Singapore, April, 2007 | 40 Barber, Journeys of Discovery (2005) | 41 Harvey-Beavis, Performance Based Rewards for Teachers (2003). CTAC, Catalyst for Change: Pay for Performance in Denver (2001) | 42 Elmore, School Reform From The Inside Out (2004)

DIFFERENT APPROACHES

There are broadly four approaches high-performing school systems use to help teachers improve instruction, create awareness of weaknesses in their practice, provide them with a precise knowledge of best practice, and motivate them to make the necessary improvements.

- **Building practical skills during the initial training:** Several high-performing and improving systems have moved their initial period of training from the lecture theatre to the classroom. This allows them to build teaching skills more effectively. On the one-year Teacher Residency program in Boston, for example, trainees spend four days each week in a school. In England, two thirds of the time on one-year teacher training courses is devoted to teaching practice.[43] In Japan, teachers spend up to two days a week in one-on-one coaching in their classrooms, during their first year of training.
- **Placing coaches in schools to support teachers:** All top systems, including the rapidly improving ones, recognize that if you want good teachers, you need to have good teachers train them, and this requires focused one-on-one coaching in the classroom. Expert teachers are sent into the classroom to observe and provide one-on-one coaching in terms of feedback, modelling better instruction, and in helping teachers to reflect upon their own practice. In England, teachers with a track record of excellent instruction are given reduced teaching loads in order to allow them to spend more time coaching their colleagues. In Chicago and Boston, literacy coaches work one-on-one with teachers in classrooms to help them to improve their instruction.

> despite the evidence, and the fact that almost every other profession conducts most of its training in real-life settings (doctors and nurses in hospitals, clergy in churches, lawyers in courtrooms, consultants with clients) very little teacher training takes place in the teacher's own classrooms, the place in which it would be precise and relevant enough to be the most effective.

- **Selecting and developing effective instructional leaders:** Coaching is effective as an intervention, but it can become even more so once schools have developed the culture of coaching and development that will sustain it. To achieve this goal, certain school systems have ensured that their school leaders are also 'instructional leaders'. They have put in place mechanisms for selecting the best teachers to become principals, and then train them to become instructional leaders who then spend a good portion of their time coaching and mentoring their teachers. Principals in small schools in most of the top systems spent 80 percent of the school day focused on improving instruction and demonstrating a set of behaviours which build the capacity and motivation of their teachers to constantly improve their own instruction.
- **Enabling teachers to learn from each other:** Finally, some of the best systems have found ways to enable teachers to learn from each other. Teachers in most schools work alone. In a number of the top systems, particularly those in Japan and Finland teachers work together, plan their lessons jointly, observe each others' lessons, and help each other improve. These systems create a culture in their schools in which collaborative planning, reflection on instruction, and peer coaching are the norm and constant features of school life. This enables teachers to develop continuously.

Most of the top systems combine two or three of these approaches. While the first two approaches are interventions that improve instruction but which do not attempt to embed a culture of continuous improvement, the other two complement them by focusing on the creation of a culture that can help ensure sustained improvement.

BUILDING PRACTICAL SKILLS DURING INITIAL TRAINING

Teachers develop the bulk of their instructional capability during their first years of training and practice. In several of the school systems we studied, the evidence suggests that the support given to teachers during this period (both in their initial training, and the support they were given during their first years of practice) was rarely as effective as it should have been. Research shows that in the United States many teacher education programs have little impact on teacher effectiveness.[44] Frequently, this is because the connection between what the trainee teachers do during their training, and what they are expected to be able to do once they arrive in the classroom, is not strong enough. Angus McBeath, former superintendent of Edmonton's schools in Alberta, noted, ''We would never turn out a freshly minted doctor and say, 'go operate on somebody' without three or four years of practice - guided practice.But we turn out teachers, put them in classrooms, and ignore them.''[45]

43 They stipulate 18 weeks for primary postgraduate certificate programs, 24 weeks for secondary and key stage 2/3 programs.44 Chaney, Student outcomes and the professional preparation of 8th grade teachers, Goldhaber and Brewer, Does certification matter? | 45 McBeath, Getting Districtwide Results (2006)

All of the better school systems we studied had integrated practicum into their teacher training programs. Boston, England, Finland and Japan went further, in increasing the amount of intensive practical support given to new teachers and in finding ways to ensure that the support they give is more effective.

- **Boston:** Boston has introduced a graduate teacher training program based on a medical-residency model, combining a large amount of practical experience, a strong theoretical background, and a higher-level (masters) degree qualification. After an initial six-week summer school, trainee teachers spend one year on an apprenticeship in schools. During this year they spend four days each week working with an experienced teacher, and one day a week doing coursework. During their second year, each new teacher is allocated a mentor who provides two-and-a-half hours of in-class coaching each week. Mentors ''model, co-teach, observe and help with classroom management, lesson planning and instructional strategies.''[46] In order to improve the quality of mentoring on the program, Boston now employs a number of full-time specialist mentors, each of whom supports 14 new teachers.
- **England:** England has placed all funding for teacher training under the control of a new agency, the Training and Development Agency for Schools (TDA). The TDA set strict standards for teacher training institution, including a minimum requirement of 24 weeks[47] of practical experience on most courses (two thirds of the total course time on one year programs) with the requirement that this classroom experience provides a good learning environment for trainee teachers. Providers are inspected by an independent inspectorate; the TDA reduces funding or closes down providers which do not meet the standards. England has also introduced an induction year, during which new teachers are given increased support and supervision, a reduced teaching load that allows extra time for planning and training, and a regular performance review to highlight areas requiring improvement.
- **Finland:** Most faculties of education manage their own training schools: these are fully operational schools where students carry out their initial teaching practice. The organizational structure helps to ensure that the content of teacher training is tightly linked to the actual practice within schools, and provides additional opportunities for the faculty to incorporate observation and practice gained in the classroom into their teacher training courses.
- **Japan:** The teacher preparation programs at Japan's universities focus mainly on building the intrinsic capabilities, content knowledge, and the pedagogical knowledge of aspirant teachers. In 1989, Japan introduced an intense training program for first-year teachers during which trainees develop their practical teaching skills. In this program, trainee teachers work full-time in schools and during their first year are provided with up to two days of one-on-one coaching and support each week from 'guidance teachers'. Guidance teachers coach and mentor but do not evaluate new teachers during their first year in the classroom.

PLACING COACHES IN SCHOOLS TO SUPPORT TEACHERS IN THE CLASSROOM

The next challenge is to make in-service training an effective tool to improve instruction. Several of the systems do this through on-the-job coaching. Expert teachers, trained in how to coach other teachers, enter classrooms to observe teachers, give feedback, model instruction, and share in planning. In some cases the experts are full-time coaches employed by the district or ministry, in others they are experienced teachers with a track record of excellent instruction who have been given a reduced teaching load so that they can support and coach other teachers. Singapore appoints senior teachers and master teachers to lead the coaching and development of the teachers in each of its school.

Coaching interventions can lead to a substantial improvement in outcomes in a short time. Through its National Literacy and Numeracy Strategies, England has trained numeracy and literacy coaches in every primary school. It developed a network of national experts to train these coaches, focusing both on effective pedagogies to be used to improve student outcomes and on the techniques to get teachers to employ them. The result has been a significant improvement in outcomes over a period of just three years. Several of the Middle Eastern systems have used coaching strategies to effect significant changes in instruction in their schools, bringing in coaches from foreign school systems to quickly train large numbers of teachers in different teaching styles.

SELECTING AND DEVELOPING EFFECTIVE INSTRUCTIONAL LEADERS

The research on school leadership suggests that ''school leadership is second only to classroom teaching as an influence on learning.''[48] Some 97 percent of schools in England rated good or excellent overall by the independent inspectorate are led by management teams that are also rated good or excellent overall; only 8 percent of schools with leadership teams rated satisfactory or below are rated good or excellent overall.[49] Research shows that without an effective headteacher [principal], a school is unlikely to have a culture of high expectations, or strive for continuous improvement. ''...Schools are vulnerable where a formerly good headteacher becomes less effective over time, or where a strong headteacher leaves the school without having developed a confident and effective leadership team.''[50]

46 Interview: Boston, January, 2007 | 47 See note 36 | 48 NCSL, Seven Strong Claims about Successful School Leadership (2006) | 49 Ofsted, School Inspection Data (2005/2006) | 50 National Audit Office, Improving Failing Schools (2006)

Exhibit 18: **Chicago: selecting principals**

	Eligibility	Appointment
Level	• District	• School
Aim	• Select candidates with the highest leadership potential from a general pool of applicants	• Select the right candidate for each school from the eligible pool
Process	• Candidates develop a portfolio, describing their experience in different competencies, e.g. giving evidence of instructional leadership • Portfolios are reviewed by a committee of retired principals, with a first-time pass rate of one in three • Candidates are interviewed by the portfolio-review committee • Candidates must pass an exam on district school policy	• Chicago aims to have 5-6 eligible good-fit candidates apply for each position • Candidates apply direct to the school. The school committee interviews and selects the principal • The committee is supported by an area leader who provides expert advice on principal selection • Committees give parents, the community and teachers a strong voice in the appointment process, which generally means that appointed candidates have strong support from the school once they take up their position

Source: Interviews, Chicago Public Schools, McKinsey

The evidence suggests that strong school leadership is particularly important in producing improvement. Reforms in Boston, England, and Singapore all demonstrate that good leadership in schools is important in effecting fast and substantial changes to practice. Top-performing school systems leverage a substantial and growing knowledge about what constitutes effective school leadership to develop their principals into drivers of improvement in instruction. In general, developing effective instruction leaders in schools meant doing three things:

- **Getting the right teachers to become principals**
- **Developing instructional leadership skills**
- **Focusing each principal's time on instructional leadership**

GETTING THE RIGHT TEACHERS TO BECOME PRINCIPALS

To produce effective school leaders, school systems first need to select the right people to become leaders. Research on effective school leadership shows that, ''a small handful of personal traits explain a high proportion of the variation in leadership effectivness.''[51] To get the right people to become school leaders, high-performing school systems provide the right incentives to get the best teachers to apply for leadership positions, and implement processes effective in selecting the best of those who apply. How they do this depends mainly on whether principal selection is centralized (i.e. controlled by the district or ministry), or decentralized (i.e. controlled by individual schools). Singapore and Chicago illustrate two systems for doing this.

- **Singapore:** Principals salaries are high, partly in recognition of the demands of the role, as well as to attract strong candidates. As part of the stringent selection process for principals, candidates are put through an Assessment Centre, which is a series of carefully designed exercises that elicit observable behaviours related to the core competencies of a school leader. Candidates that are found to have principalship potential attend a six-month program run by the National Institute of Education. These candidates are assessed continuously by the training team, and this assessment is fed into the selection process. This ongoing assessment over a six-month period provides a more accurate reading of the intrinsic capabilities than is achieved by a regular recruitment process. At the end of the six-month program, only candidates who are found to be ready for principalship and can be matched to schools are appointed as principals.
- **Chicago:** Principals are selected and employed by individual school committees, making it more difficult for the district to control quality than in Singapore. In response to this organizational challenge, the city has introduced tough eligibility criteria, creating a two-stage selection process. In order to apply for a principal position, candidates first need to pass through this eligibility process (two-thirds of applicants fail on their first attempt). Eligible candidates then compete for principal positions at individual schools (Exhibit 18).

DEVELOPING INSTRUCTIONAL LEADERSHIP SKILLS

Getting the right people to become school leaders is very important, but so is providing these people with the right set of skills to be effective leaders. Essentially, all successful school leaders ''draw on the same repertoire of basic leadership practices.''[52] The best-performing school system's implement a coherent and aligned development model, (frequently based on an apprenticeship model) which helps aspiring and existing school leaders to develop these practices (Exhibits 19 & 20).

FOCUSING EACH PRINCIPAL'S TIME ON INSTRUCTIONAL LEADERSHIP

Once the school system has identified and developed the right people with the right skills, it then needs to structure the roles, expectations and incentives to ensure that its principals focus on instructional leadership, not on school administration. This contrasts with school systems in which many principals spend most of their time on tasks not directly related to improving instruction in their schools, thus limiting their capacity to effect real improvement in student outcomes.[53] The systems which seek to use their principals as drivers of reform expect

51 NCSL, Seven Strong Claims about Successful School Leadership (2006) | 52 NCSL, Seven Strong Claims about Successful School Leadership (2006) | 53 DfES, Independent Study into School Leadership (2007)

Exhibit 19: Boston: developing principals

Fellowship program	• 3 days a week on apprenticeship in schools, working with an experienced principal • 2 days a week in classes and seminars, focused on management techniques, and instructional leadership • Fellows are paid a salary during training; they compete for principal positions on graduation
New principal support	• *Summer institute*: A five-day program focused on preparing principals for their first 2-3 weeks in the school • *Mentoring:* Each new principal is mentored by an experienced principal with a complementary set of skills • *Central Support* on administrative issues, e.g. school budgeting • *Networking meetings*: monthly facilitated cohort meetings • *Just-in-time sessions*: Seminars or workshops for the cohort group to cover specific problem areas, as requested
On-going development	• Deputy Superintendents: Boston requires that deputy superintendents devote most of their time to coaching principals • Clusters: The district is divided into 9 clusters, each with a cluster leader. The cluster leader provides mentoring and support for other principals in the cluster, without having a direct evaluative or supervisory role

Source: Interviews, Boston Public Schools, McKinsey

Exhibit 20: Singapore: developing principals

"We train our teachers and vice-principals to apply best practices; we train our principals to create them"

Six month program to develop new principals	• **Management and leadership courses** taken from leading executive training programs • **One day a week in schools** were candidates are assigned to develop innovative approaches to the toughest problems that the school faces • **Group projects** where candidates work as teams to develop new educational approaches • **2-week overseas placement** with a foreign corporation (e.g. IBM, HP, Ritz Carlton), where they shadow top private-sector executives in order to gain a private-sector perspective on distinctive leadership • **Rigorous evaluation –** only candidates who demonstrate the required competencies will be appointed as a principal

Source: Interviews, McKinsey

Exhibit 21: Japan: Learning communities

Enabling teachers to share best practice, learn from each others strengths and weaknesses, and jointly develop and disseminate excellent practice

Lesson study

Teachers work in teams to analyse and develop model lessons. The study requires each teacher to reflect in depth on their own practice, with the assistance of their peers. The final sample lessons are recorded and distributed.

Demonstration lessons

Teachers demonstrate excellent practice to a wider group of instructors, followed by discussion and feedback sessions. The lessons are used to give each teacher access to examples of excellent practice, to recognise development, and to hold teachers accountable for the quality of their instruction

Source: Interviews, McKinsey

them to be excellent instructors who spent most of their time coaching teachers. In the words of one highly successful principal we interviewed: ''Being a teacher is about helping children to learn. Being a principal is about helping adults to learn. That's why it's tough... I walk the halls, walk the halls, and walk the halls... I only look at my inbox after everybody else leaves.''[54]

ENABLING TEACHERS TO LEARN FROM EACH OTHER

The final approach is to enable teachers to learn from each other. Unlike other professions, where professionals naturally operate in teams, teachers generally work alone, denying them natural opportunities to learn from each other. Several school systems employ strategies aimed to change this by creating schools in which teachers regularly observe each others' practice, thereby producing an environment which stimulates the sharing of knowledge on what works and what does not, encourages teachers to give each other feedback, and helps shape a common aspiration and motivation for improving the quality of instruction. These systems are some of the best performing of all of the systems we studied.

- **Japan:** The learning culture in its schools is centred on 'lesson study' (kenkyuu jugyou). Groups of teachers work together to refine individual lessons, jointly planning, executing and then evaluating different instructional strategies for achieving a specific learning objective. Groups of teachers visit each others classrooms to observe and understand the practice of other teachers (Exhibit 21). There is a strong emphasis on making sure that best practices are shared throughout the school: ''When a brilliant American teacher retires, almost all of the lesson plans and practices that she has developed also retire. When a Japanese teacher retires, she leaves a legacy.''[55]
- **Boston:** Teachers are timetabled so that all of the teachers who teach the same subject at the same grade level have 'free classes' together. This time is used for jointly planning and analysing teaching practice based on assessment data. The sessions are facilitated, either by the principal or one of the literacy coaches, and use assessment data as the basis for structured discussion. The aim is to uncover differences between the instructional practices of the various teachers in the school and to understand how these differences impact results. The sessions are followed by peer observation and common planning of teaching strategies (Exhibit 22). Some of the schools using this approach are built on an open plan: without doors between classrooms, and sometimes without walls. This facilitates collaborative teaching and encourages teachers to learn from each other.

54 Interview: Boston, January, 2007 | 55 Chenoweth, from Lewis, Does Lesson Study have a future in the United States (2002)

Exhibit 22: **Boston: Common planning time**

Creating space for discussion	• Teachers were timetabled so that all of the teachers teaching the same subject at the same grade had free classes at the same time • The classes were used for joint planning of teaching
Making the sessions effective	• Discussions were data-driven, using individual student data to identify strong and weak points in each teacher's instruction • Use of the data created shared accountability and drive towards results • The sessions were facilitated, either by the principal or one of the literacy coaches
Individuals to teams	• Teachers spent more time watching each other lessons. Some schools were built on an open plan, so teachers were constantly observing each others practice

Source: Interviews, Boston Public Schools, McKinsey

- **Finland:** Teachers are given one afternoon each week for joint planning and curriculum development. The fact that the national curriculum specifies only general outcome goals, rather than the path by which to attain them, mean that teachers in schools have to work together to develop the curriculum and the instructional strategies tailored to the needs of their school. Schools in the same municipality are encouraged to work together and share materials so that best practices spread quickly throughout the system.

CONCLUSION

Many of the reforms we studied failed to deliver improvement because they had little effect on what happened inside the classroom. Cuban's analogy of the effect of many school reforms on teaching practice is that they have a similar effect to that of a storm on the ocean: ''The surface is agitated and turbulent, while the ocean floor is calm and serene (if a bit murky). Policy churns dramatically, creating the appearance of major changes .. while deep below the surface, life goes on largely uninterrupted.''[56]

All the evidence from both the high- and low-performing systems shows that the most effective way to deliver sustained and substantial improvements in outcomes is through sustained and substantial improvements in instruction. School systems from Singapore to England and from Finland to Boston have done this successfully, catalysing significant improvements in instruction that have led to demonstrable improvements in student outcomes. The four different approaches that have proved effective all begin with an understanding of what it takes to improve the quality of instruction of a single teacher, and then develop the systems to create these conditions for all teachers. They show that while the task of transforming instruction on a large scale is challenging, it is nevertheless achievable.

being a teacher is about helping children to learn. Being a principal is about helping adults to learn. that s why it s tough... I walk the halls, walk the halls, and walk the halls... i only look at my inbox after everybody else leaves

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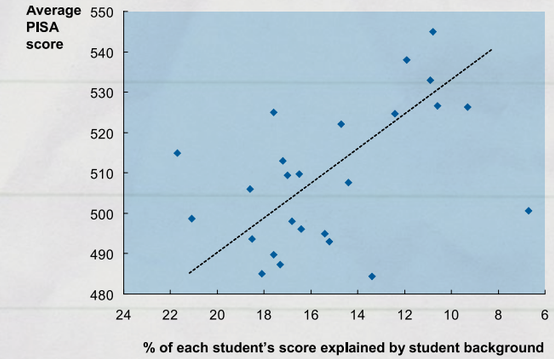
"Delivering for every child"

Getting the right people to become teachers and developing them into effective instructors gives school systems the capacity they need to deliver the improved instruction that leads to improved outcomes. High-performing school systems go further than this and put in place processes which are designed to ensure that every child is able to benefit from this increased capacity. These systems set high expectations for what each and every child should achieve, and then monitor performance against the expectations, intervening whenever they are not met. High-performing school systems construct effective interventions at the level of the school, identifying schools that are not performing satisfactorily, and intervening to raise standards of performance. The very best systems intervene at the level of the individual student, developing processes and structures within schools that are able to identify whenever a student is starting to fall behind, and then intervening to improve that child's performance.

The extent to which a school system is able to realise the benefits of improved instruction depends on its ability to deploy it effectively: the system needs to ensure that every child, rather than just some children, has access to excellent instruction. Ensuring that every child benefits from high-quality instruction is not only an important end in itself, the evidence from international assessments suggests that strong performance for the system as a whole is dependent on this being the case. For example, the PISA scores of the top performing systems show a low correlation between outcomes and the home background of the individual student (Exhibit 23). The best systems have produced approaches to ensure that the school can compensate for the disadvantages resulting from the student's home environment.

Exhibit 23: **Outcomes correlated to home background**

PISA scores and socioeconomic background for countries scoring above 480 in the PISA assessment



Source: PISA, 2003

for example, the PISA scores of the top performing systems show a low correlation between outcomes and the home background of the individual student

In many of the systems we studied, the systems to ensure consistent high-quality instruction are either absent or broken. In England, for instance, mechanisms to intervene in poorly performing schools were introduced into the system only relatively recently: "The idea that a school could be failing, known to be failing, and left failing, looks scandalous in retrospect... High performance requires every child to succeed"[57]. Systems that compensate for the effects of low income and poor home background on educational achievement are still far from universal. Yet in many cases these interventions are critical in ensuring that the overall level of performance of the school system can be raised sufficiently: the evidence suggests that poorer families and poorer localities invest less in their children's education, dragging down overall performance. In the United States, for instance, children whose mothers have bachelor's degrees are almost twice as likely to be enrolled in preschool programs as children whose mothers have not completed high school.[58] In general, richer localities produce better schools because of better funding. Annual current expenditure on students in the top five percent, best-funded public schools in the

57 Michael Barber, lecture, London, 2007
58 RAND, The Economics of Investing in Universal Preschool Education in California (2005)

United States, for instance, is $ 12,400, while expenditure in the bottom five percent, worst-funded schools it totals just $ 5,700. These discrepancies also impact recruitment. Students in schools that serve students from a poorer socioeconomic background are twice as likely to be taught by teachers with less than three years experience than students in schools which serve students from a richer socioeconomic background.[59] All these factors compound the lower expectations and inequality of opportunity for students from a poorer background.

The high-performing systems are better at ensuring that each student receives the instruction they need to compensate for their home background. They start by setting clear and high expectations for what individual students should know, understand, and be able to do. They ensure that resources and funding are targeted at those students who need them most, not those who need them least. They then closely monitor the performance of schools against these expectations and develop effective mechanisms for intervening when these expectations are not met. Different systems have different ways of doing this. In general, the level of monitoring and intervention in the best-performing systems is inversely proportional to the capacity of individual teachers and the schools to improve by themselves. The best systems locate the processes for monitoring and intervention in the schools themselves, where they are able to identify the students in need of support and provide that support when needed on a continuous basis.

SETTING HIGH EXPECTATIONS FOR WHAT STUDENTS SHOULD ACHIEVE

All of the top-performing and rapidly improving systems have curriculum standards which set clear and high expectations for what students should achieve. Boston's reform is directed towards increasing the number of students meeting the Massachusetts state standards – some

all of the top-performing and rapidly improving systems have curriculum standards which set clear and high expectations for what students should achieve

of the toughest in the United States. Alberta sets high expectations for student achievement, and then participates in international exams such as PISA and TIMSS to benchmark its standards: ''If our kids are passing the provincial examinations but performing below other top systems in PISA, then we know that we need to raise our standards.''[60] Finland reformed its curriculum in 1992, replacing a previously rigid national curriculum with targets for all students: ''We do well because we aim high.''[61]

In general, school systems use more prescriptive standards when the overall performance level of the system is low, and then relax those standards as the system improves. For instance, Boston found that the Massachusetts state standards were too loose, given the overall performance of its system: ''The standards were at 10,000 feet, we needed something closer to the ground.''[62] England's current National Curriculum is two-thirds the length of when it was originally introduced in 1990, its length reflecting a growing willingness to give teachers more freedom as quality of outcomes has improved. Finland, one of the highest performing of the systems we studied, arguably has one of the least prescriptive curricula: ''The target is high, but we want teachers to be able to make their own choices.''[63] The Finnish curriculum emphasizes the need for teachers to adapt learning to the specific context in which they find themselves, and recognizes the fact that children learn at different rates, while at the same time setting high expectations for what should ultimately be achieved.

The process by which these expectations are set is frequently long, difficult and controversial, and the resulting curricula varies widely as a result. Yet some things are a constant in all the top systems. They all place a strong focus on numeracy and literacy in the early years based, in part, on substantial research evidence which shows that early ability in core skills is strongly correlated with a range of future outcomes: a major longitudinal study in the United Kingdom, for instance, found that test scores in literacy and numeracy at age seven were significant determinants of earnings at age 37, even after controlling for socioeconomic background.[64] There is also a growing tendency to align standards globally, particularly in reference to those of the OECD's PISA assessments and other leading school assessment systems. Certain systems try to match current teaching to the country's future requirements. Singapore has invested heavily in trying to anticipate the required range and mix of skills that its students will need when they graduate to further grow Singapore's economy, and matches its curriculum to those needs. Whatever the differences, however, all the top systems recognise the need to set clear and high expectations for the performance of their students.

MONITORING AND INTERVENING AT THE SCHOOLS LEVEL

All of the top-performing systems also recognize that they can not improve what they do not measure. Monitoring outcomes allows them to identify and spread

59 Kati Haycock, Achievement in America: Can we close the gaps (2006) | 60 Phone interview: Alberta, March, 2007 | 61 Interview: Finland, March, 2007 | 62 Interview: Boston, January, 2007
63 Interview: Finland, March, 2007 | 64 Currie, Thomas, Early Test Scores, Socioeconomic Status and Future Outcomes (1998)

Exhibit 24: **Inspections and examinations**

School System	School review/ inspections*	System-wide assessments**	School exit examinations**
Alberta	○	◑	◑
Boston	○	●	○
Chicago	○	●	○
England	●	●	●
Finland	○	◑	◑
Hong Kong	◑	●	●
Korea	○	●	●
Netherlands	●		
New York	◑		
New Zealand	●	◑	●
Singapore	◑	●	●

○ Not separated
◑ Separate unit within Ministry
● External organization

*Formal school reviews conducted by a person to whom the school is not directly accountable
**Assessments of students during the first 10 grades; School Exit examinations refers to leaving qualifications
Source: Interviews, McKinsey

all of the top-performing systems also recognize that they can not improve what they do not measure

65 Phone interview: May, 2006 | 66 Interview: New Zealand, May, 2006

best practices, to pinpoint areas of weakness, and to hold schools accountable for their results. In general, the intensity of the monitoring that is carried out is in inverse proportion to the overall performance, both within and between systems. Thus, while rapidly improving systems such as Boston and Chicago test every student every year between grade three and grade eight, top-performing systems such Finland have largely dispensed with national examinations, conducting only periodic assessments of student performance, the results of which stay confidential. Within systems, schools which perform well are subject to less monitoring (for instance, Singapore exempts its top schools from certain examinations), whereas schools which perform poorly are subject to more intensive scrutiny (for instance, schools in England which are identified as underperforming are subject to more frequent reviews until their performance improves).

The high-performing systems use two mechanisms for monitoring the quality of teaching and learning (Exhibit 24):

- **Examinations:** Examinations test what students know, understand and can do, providing an objective measure of actual outcomes at a high level of detail. Examinations also have a powerful effect in driving the performance of any school system. In the words of one Australian educationalist, ''What gets tested is what gets learnt, and how it is tested determines how it is learnt.''[65]
- **School review:** School reviews, or inspections, assess the performance of a school against a benchmark set of indicators. Unlike examinations, they measure both outcomes and the processes which drive them, and as a result, can help schools and systems identify specific areas which are in need of improvement. School reviews also enable systems to measure some of the more subtle and complex desired outcomes of a school system, which are difficult or impossible to measure in examinations.

In many of the top-performing systems, responsibility for monitoring outcomes has been separated out from the responsibility for improving those outcomes. In the words of one policymaker in New Zealand, ''You can't have the same people who are responsible for improving education be responsible for judging whether or not that improvement has occurred.''[66] Hong Kong has created a school inspectorate, which is separate to the school branch offices to which the schools report, but still inside its ministry of education, and an independent examination board (HKEAA), which is outside the ministry but is still ultimately accountable to the minister. England has created an independent inspectorate (Ofsted) which is directly accountable to parliament, and it places national assessments under a semi-independent regulator (the QCA). New Zealand has created an independent schools inspectorate which reports to its own minister (though the two portfolios – Minister of Education and Minister Responsible for the ERO – are frequently held by the same person).

In general, the arrangements for school review depend on the overall level of performance of the system, and in some cases, the individual performance level of schools. Typically, as the school system improves, the task of monitoring moves from external agencies to the schools themselves.

- **Annual external review:** School systems embarking on ambitious reforms tend to use more frequent external reviews. In New York, Qatar, and Bahrain (all of which are embarking on ambitious reform efforts) all the schools are to be reviewed by an external inspectorate once every year. All three systems plan to reduce either the length or the frequency of external reviews as their system improves.

- **Self-evaluation with external review every 3-4 years:** In England, Hong Kong and New Zealand, schools are inspected once every three-to-four years, with a strong emphasis on on-going school self-evaluation during the intervening period. All three systems are evolving towards less intensive review models as they improve: England, for instance, introduced a new inspection regime in 2005 which in most cases more than halved the number of days' spent on the inspection. Schools which perform well are inspected less frequently and less intensively than those which perform badly.
- **Self-review with occasional external review:** In Singapore, schools are expected to undertake regular self-evaluation: external school reviews occur only once every five years. In Finland, there is no formal review cycle: schools can request an informal audit of their teaching and learning at any point to complement their own internal review processes.

Monitoring outcomes ensures that the system has the information it needs to be able to intervene when schools start to fail. Effective interventions, best illustrated by those conducted in England, New York and New Zealand, are characterised by a number of features:

- **Publication of performance reports:** In many cases, systems that set out to be transparent about the performance of their schools (typically by publishing the inspection or examination data) create greater public accountability and awareness which, in turn, drives further improvement. In the words of one New Zealand policymaker: ''[We] make everything public; it creates tension in the system – transparency over the problems – and that drives improvement.''[67] However, the evidence from the systems which publish performance reports shows that though many good schools improve further under the pressure

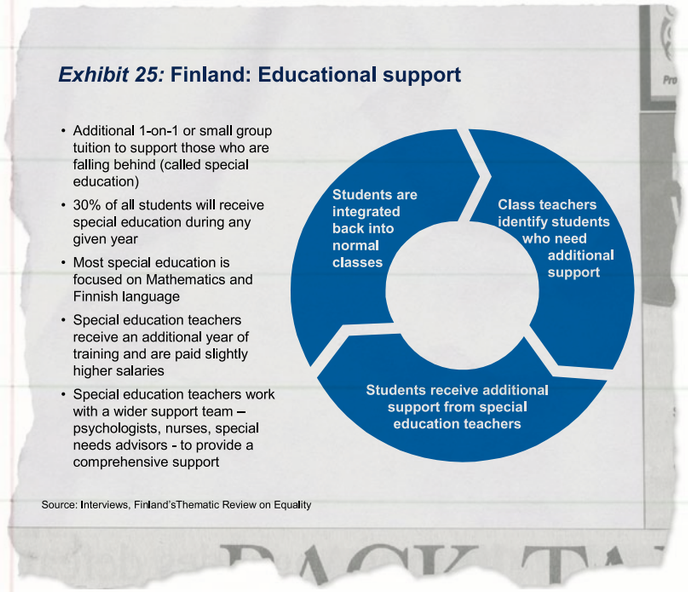
> you can't have the same people who are responsible for improving education be responsible for judging whether or not that improvement has occurred

resulting from the transparency of the system, failing schools seldom improve for this reason alone. ''If a school does not know how to improve, if it lacks the capacity to improve, then no amount of pressure will change instruction.''[68] Indeed, in some top-performing systems, transparency about school performance is perceived as an obstacle rather than an aid to improvement: ''Improvement comes from building capacity, and harnessing the motivation that teachers and schools already have; additional pressure just leads to regressive behaviours [for example teaching to the test, drilling students on examination questions, preventing poor students from taking the test, and potentially fraudulent behaviour].''[69] Finland keeps performance assessments and audits confidential, providing results only to the school that has been assessed and to their municipalities. Hong Kong has adopted a policy of not publishing performance data in order to reduce what is widely perceived to be the already excessive performance pressures on students and teachers.

- **Funding:** New Zealand, Alberta, England and Chicago have all introduced funding models which divert additional resources to those schools which are in need of improvement. The funding formulae provides increased funding to schools which enrol pupils from disadvantaged backgrounds. England has made additional funds available to a large number of schools perceived to be at a higher- than-average risk of failure: this sum totals $1.5 billion dollars each school year.
- **Intervention to replace or improve leadership:** Most evidence about remedying the performance of failing schools suggests that strong school leadership is essential. The top-performing systems, as well as rapidly improving ones, create mechanisms to allow central or local government to replace the school's leadership in cases where normal governance arrangements do not allow this to happen. In Chicago, England, and New Zealand, the district, local authorities, or central government, respectively, have the right to replace the school leadership when a school fails to improve. Boston removes the bottom five percent of principals during the first year of their reform, and then several of the lowest performing principals each year thereafter.

In addition, the best systems use the results of monitoring and intervention to identify best practices, which can then be spread throughout the system. Singapore studies the practices in its best schools, and has ensured that the lessons from this are transferred to other schools. Singaporean researchers have built classroom-laboratories at the National Institute for Education where they carefully monitor student reactions to new instructional ideas, techniques and strategies being tested there. They then apply their findings to future education reform. Singapore spends almost US$10 million each year on research into better instructional practice. England uses data from its inspections and assessments to identify the best schools and teachers, and then uses this to develop new approaches and further reform.

67 Ibid | 68 Michael Barber, op.cit | 69 Interview: Finland, March, 2007



MONITORING AND INTERVENING AT THE STUDENTS LEVEL

Intervention at the level of the school prevents clusters of failure from emerging in the system. However, the most effective schools and school systems monitor and intervene at the level of individual students. This is essential if the system is to deliver consistently strong performance throughout all its schools. Evidence from the United States shows that by age three the average child of professional parents has a vocabulary of 1,100 words and an IQ of 117, whereas the average child of parents on welfare has a vocabulary of just 525 words and an IQ of 79.[70] Unless schools intervene effectively to compensate for the impact of a poorer home environment, they stand little chance of closing this gap. The best schools in each system have developed mechanisms for doing just this. Finland has gone further than any other system in ensuring that there is a uniformly high performance across its entire system.

70 Hart and Risley, from New York Times "What it takes to Make a Student" (26 November 2006).

Finnish children start preschool at age six and school at age seven, three years later than many of their European counterparts. Once in primary school, they study for just four to five hours a day. Finnish children receive fewer hours of instruction between the ages of seven and 14 than any other children in an OECD country. Yet by age 15, Finnish children top the world in the OECD's assessments of reading, mathematics, science and problem solving, performing significantly better than all their Scandinavian neighbours.

Part of the explanation for this is that Finland gets the right people to become teachers (recruiting from the top 10 percent of school leavers, controlling admission to teacher education, and paying good starting compensation), and has developed them into effective instructors once they are selected (through excellent pre-service training, excellent instructional leadership, and professional learning communities within schools). This is not the entire story, however. Finland has also developed a highly effective system of interventions to support individual students within schools. Each Finnish school employs a number of special education teachers. In the schools we visited during our benchmarking, we observed that on average there was one special education teacher for every seven class teachers. Special education teachers provide support one-on-one or in small-group to students who are at risk of falling behind. They intervene to support 30 percent of all students in a school in any given year. These special education teachers provide support mainly in the subjects of Finnish and mathematics, and are given an additional year of teacher training to support them in this role.

Special education has been de-stigmatized in Finland by two practices. Firstly, by the high volume of students who take part in the program. Secondly, by the practice in which the best students are also sent, on occasion, for additional instruction: this makes it clear that such intervention is not necessarily a sign of underperformance. By intervening quickly at the level of individual students, Finland prevents early failure compounding into long-term failure, and thus has found a way to maintain strong and consistently equitable outcomes in its schools (Exhibit 25).

Other top-performing systems have developed different approaches by which they ensure that they can intervene to support children who are falling behind. Asia's systems depend on strong commitment from individual teachers to provide the necessary extra support where it is required. In Singapore, for instance, teachers typically remain in school for several hours after formal lessons have ended, providing additional teaching to those students who need it most. Singapore also provides extra classes for small groups of the lowest-performing 20 percent of students during the first and second grades. In New Zealand, the Reading Recovery program is designed to provide extra instruction for students whose reading performance is poor.

CONCLUSION

A combination of monitoring and effective intervention is essential in ensuring that good instruction is delivered consistently across the system. High-performing school systems monitor their performance through examinations and inspections, making the intensity of this monitoring inversely proportional to the capacity of individual schools to improve by themselves. They use the results of the monitoring to inform effective interventions to raise standards and achieve a uniformly high performance. The best systems take these processes inside schools, constantly evaluating student performance and constructing interventions to assist individual students in order to prevent them from falling behind.

39

Conclusion: The system and the journey

South Korea and Singapore demonstrate that a school system can go from low performance to high performance within a few decades. This achievement is even more remarkable given that it typically takes a long time to see the impact of a reform effort (the test scores on graduation from high school are highly dependent on the quality of primary education that students received ten years earlier which, in turn, is highly dependent on the quality of people who became teachers sometime before this). Boston and England have also demonstrated that substantial improvements in both the outcomes and the factors that drive them (for instance, the status of the teaching profession) can be achieved in short period of time.

All the different school systems that have improved significantly have done so primarily because they have produced a system that is more effective in doing three things: getting more talented people to become teachers, developing these teachers into better instructors, and in ensuring that these instructors deliver consistently for every child in the system. The way in which they have done these things varies somewhat. Singapore's school system is managed from the centre and they have used this to drive through improvements in performance. In England, policymakers have relatively less control over its more decentralized school system, so they have used standards, funding, public accountability, and strong support mechanisms to create the conditions under which improvement can occur. In other systems, the strength of unions or other political actors has had influence over the pace and path of reform, though maybe not its ultimate direction.

Putting these three things in place often requires more general reform to the school system. School reforms rarely succeed without effective leadership, both at the level of the system, and at the level of individual schools. One study noted that, "there is not a single documented case of a school successfully turning around its pupil achievement trajectory in the absence of talented leadership."[71] Similarly, we did not find a single school system which had been turned around that did not possess sustained, committed and talented leadership. Changing the governance or management of a system might, therefore, be a necessary prerequisite for improvement, even if such changes do not necessarily lead to improvement in themselves. Similarly, systems which do not fund equitably ensure that poorer schools have little chance of performing well, even though simply changing the funding structure does not of itself necessarily lead to improvement. The nature of the curriculum is critical, though without an effective system for delivering the curriculum, any changes to course content or learning objectives will have little impact on outcomes.

The school systems we have benchmarked demonstrate that delivering substantial improvements in outcomes is both challenging and achievable. The three themes identified in this paper, and the best practices for achieving them, form the core of what system leaders must do to ensure improvement. The paths which the various school systems have taken in the past, and the paths which other school systems will have to take in the future to achieve similar performance are, inevitably, very different. Yet all school systems need to be able to answer a similar set of questions regarding these three themes and be able to match the existing parameters of best performance (Exhibit 26).

In many cases, extraneous factors hold back change and these problems need to be tackled first to enable the school system to implement policies and processes that will improve student performance. Context, culture, politics and governance will determine the course which system leaders must follow, as will their point of departure. Yet, ultimately, for achieving real improvement in outcomes, none of these things will be as important to the school system and its leaders as three guiding principles:

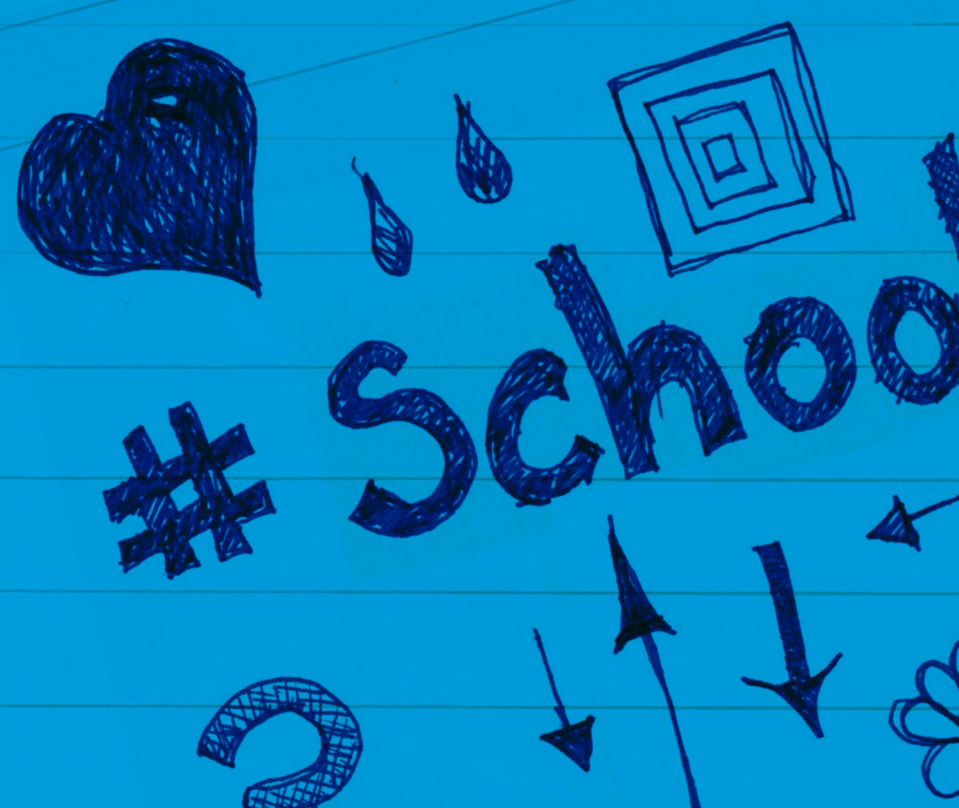
1) the quality of an education system cannot exceed the quality of its teachers, 2) the only way to improve outcomes is to improve instruction and, 3) achieving universally high outcomes is only possible by putting in place mechanisms to ensure that schools deliver high-quality instruction to every child.

71 NCSL, Seven Strong Claims about Successful School Leadership (2006)

Exhibit 26: Key questions and parameters in system development

Question	Best in world
Getting the right people to become teachers	
• What is the average academic calibre of people who become teachers?	Among the top 10% of each cohort
• How is the teaching profession viewed by university students and recent graduates?	One of the top 3 career choices
• How rigorous are selection processes into teacher training?	Rigorous checks designed to assess teaching potential; e.g. teaching practice, literacy and numeracy tests
• What is the ratio of places on initial teacher education courses to applications?	1 : 10
• How does starting compensation for teachers compare to other graduate salaries?	In-line with other graduate salaries
Developing effective instructors	
• What is the total amount of coaching new teachers receive in schools?	>20 weeks
• What proportion of each teachers time is spent on professional development?	10% of working time is used for professional development
• Does each teacher have an exact knowledge of specific weaknesses in their practice?	Yes, as a result of everyday activities occurring in schools
• Can teachers observe and understand better teaching practice in a school setting?	Yes, teachers regularly invite each other into each other's classrooms to observe and coach
• Do teachers reflect on and discuss practice?	Yes, through both formal and informal processes in schools
• What role do school leaders play in developing effective instructors?	The best coaches and instructors are selected as leaders
• How much focused, systematic research is conducted into effective instruction and then fed back into policy and classroom practice?	Research budget equivalent to $50 per student each year focused on improving instruction
Ensuring every student performs well	
• What standards exist for what students should know, understand and be able to do?	Clear standards appropriate to system performance
• What system-wide checks exist on the quality of school performance?	All schools are aware of their strengths and weaknesses
• What action is taken to tackle underperformance?	Effective mechanisms to support all failing students; minimal performance variation between schools
• How is funding and support organized?	Funding and support are focused where it can have most impact

Source: McKinsey



Bibliography

Allington, Johnston, What do we know about effective fourth grade teachers and their classrooms (2000).

Aspen Institute, Annenberg Challenge, A Case Study to Support Leadership Transition in the Boston Public Schools (2006)

Balanskat, Blamire, Kefala, The ICT Impact Report (2006).

Barber, Instruction to Deliver (2007).

Barber, Journeys of Discovery (2005).

Barber, Mourshed, Whelan, Improving Education in the Gulf (2007).

Broad Foundation, The 2006 Broad Prize for Urban Education (2006).

Business Week, Bill Gates Gets Schooled, (2006).

Cheng, New Paradigm for Re-engineering Education (2004).

Cross City Campaign, A Delicate Balance: District policies and Classroom Practice (2005).

CTAC, Catalyst for Change: Pay for Performance in Denver (2001).

Cuban, How teachers taught: Constancy and change in American classrooms, 1890-1980 (1984).

Currie, Thomas, Early Test Scores, Socioeconomic Status and Future Outcomes (1998).

Decker, Mayer, Glazerman, The Effects of Teach For America: Findings from a National Evaluation (2004).

DfES, Independent Study into School Leadership (2007).

Ellis, The Training and Development Agency for Schools (2006).

Elmore, School Reform From The Inside Out (2004).

Elmore, Grossman, King, Managing the Chicago Public Schools (2006).

Eurydice, Evaluation of Schools Providing Compulsory Education in Europe (2004).

Eurydice, Keeping Teaching Attractive for the 21st Century (2005).

Eurydice, Key Data on Education in Europe (2005).

Fuchs, Wößmann, What accounts for international differences in student performance (2004).

Fullan, The New Meaning of Educational Change (2007).

Fullan, Hill, Crevola, Breakthrough (2006).

Goh, Gopinathan, The Development of Education in Singapore Since 1965 (2007).

Goldhaber and Brewer, Does certification matter?

Guarino, Santibanez, Daley, Teacher Recruitment and Retention (2006).

Hanushek, The Evidence on Class Size (2003).

Hanushek, Wößmann, The Role of Education Quality in Economic Growth (2007).

Hart and Risley, from New York Times "What it takes to Make a Student" (26 November 2006).

Harvey-Beavis, Performance Based Rewards for Teachers (2003).

Institute of Education, Effective Provision of Preschool Education Project (2003).

Institute of Education Sciences, Effectiveness of Reading and Mathematics Software Products (2007).

IPSE, An evaluation of innovative approaches to teacher training on the Teach First Programme (2006).

Johnes and Johnes (eds.), International Handbook on the Economics of Education (2004).

Kati Haycock, Achievement in America: Can we close the gaps (2006).

Lee, Goh, Making Teacher Education Responsive and Relevant (2007).

Leschly, The Gates Foundation and Small High Schools (2003).

Leschly, Transformation of Seattle Public Schools (2002).

Lewis, Does Lesson Study have a future in the United States (2002).

Marzano¸ A New Era of Education Reform (2000).

McBeath, Getting Districtwide Results (2006).

Michaelowa, Wetchler, The Cost-Effectiveness of Inputs in Primary Education (2006).

National Audit Office, Improving Failing Schools (2006).

National Centre for Education Statistics, A Closer Look at Charter Schools using Hierarchical Linear Modeling (2006).

National Centre for Education Statistics, America's Charter Schools: Results from the NAEP Pilot Study (2003).

National Centre for Education Statistics, NEAP 2004: Trends in Academic Progress (2005).

NCEE, Tough Times or Tough Choices (2007).

NCSL, A Model of School Leadership in Challenging Urban Environments (2006).

NCSL, Seven Strong Claims about Successful School Leadership (2006).

NCTQ, Increasing the Odds: How good policies can yield better teachers.

New York City Department of Education, Children First (2007).

NFER, Trends in Standards in Literacy and Numeracy in the United Kingdom (1997).

OECD, Attracting, Developing and Retaining Effective Teachers (2005).

OECD, Education at a Glance (2000-2006).

OECD, PISA: Learning for Tomorrow's World (2004).

Ofsted, School Inspection Data (2005/2006).

Phillips, Linking NAEP Achievement Levels to TIMSS (2007).

Pritchett, Educational Quality and Costs: A Big Puzzle and Five Possible Pieces (2004).

Ramsey, Quality Matters (2000).

RAND, The Economics of Investing in Universal Preschool Education in California (2005).

Rivkin, Hanushek, Kain, Teachers Schools and Academic Achievement (2005).

Rothman, Achievement in Literacy and Numeracy by Australian 14-year olds (2002).

Sanders & Rivers, Cumulative and Residual Effects of Teachers on Future Student Academic Achievement (1996).

Schleicher, Why Education is Key for Europe's Success (2006).

Scientific American, Does Class Size Matter (2001).

Swanson, A Statistical Portrait of Public High School Graduation (2003).

Thompson and Wiliam, Tight But Loose (2007).

Training and Development Agency for Schools, Press Release (11 August 2005).

UNESCO, EFA Global Monitoring Report (2005).

Walker, Zhu, Education, Earnings and Productivity: Recent UK Evidence (2003).

Washington School Research Centre, The Power of Early Success (2005).

References

1 Spending per student in primary education, relative to GDP per capita.

2 In the course of the literature survey carried out as part of this research we consulted more than 500 papers, treatises and books on teaching and school systems. The most significant of these are referred to in the Bibliography at the end of this report.

3 Pritchett, Educational Quality and Costs: A Big Puzzle and Five Possible Pieces (2004).

4 Barber, Journeys of Discovery (2005).

5 NFER, Trends in Standards in Literacy and Numeracy in the United Kingdom (1997).

6 NAEP, America's Charter Schools: Results from the NAEP Pilot Study (2003).

7 Business Week, Bill Gates Gets Schooled, (2006).

8 Interview: New Zealand, May, 2006.

9 Cross City Campaign, A Delicate Balance: District policies and Classroom Practice (2005).

10 OECD, Attracting Developing and Retaining Effective Teachers (2005).

11 Hanushek, The Evidence on Class Size (2003). Shapson, An experimental study on the effects of class size. Akerhielm, Does class size matter?

12 Ibid.

13 The most optimistic estimates of the effectiveness of reducing class size on student achievement suggest that a reduction in class size from 23 to 15 in the early grades leads to an improvement in performance equivalent to 0.2 standard deviations.

14 Sanders & Rivers, Cumulative and Residual Effects of Teachers on Future Student Academic Achievement (1996).

15 Scientific American, Does Class Size Matter (2001).

16 Teacher Effects on Student Achievement (1997).

17 Kati Haycock, Achievement in America: Can we close the gaps (2006).

19 Interview: South Korea, 2007.

20 NCTQ, Increasing the Odds: How good policies can yield better teachers.

21 Decker, Mayer, Glazerman, The Effects of Teach for America: Findings from a National Evaluation (2004).

22 NCEE, Tough Choices or Tough Times (2007).

23 Interview: GCC, May 2006.

24 Training and Development Agency for Schools (11 August 2005).

25 Allington, Johnston, What do we know about effective fourth grade teachers and their classrooms (2000). Interviews in Singapore, South Korea, and Hong Kong.

26 Before 2007, the first round of the recruitment process had been based mainly on achievement at secondary school.

27 A full salary is paid during training on one-year programs. On longer programs, a salary is only paid during the final part of the course.

28 Interview: Finland, March, 2007.

29 OECD, Attracting Developing and Retaining Effective teachers, (from Dolton, Wolter, Denzler) p. 70.

30 Starting primary teacher salaries in South Korea are 141 percent of GDP per capita, rising to 389 percent of GDP per capita (compared to OECD averages of 95 percent and 159 percent of GDP per capita respectively) (2003).

31 The increase in the maximum salary over the starting salary in high-performing systems is as follows: an increase of 18 percent in Finland, 45 percent in New Zealand and the Netherlands, 46 percent in England, and 47 percent in Australia (average across all states and territories), compared to an OECD average of 70 percent. Source: OECD, Education at a Glance 2005.

32 Attracting Developing and Retaining Teachers: Country Report for the Netherlands, pp. 36-37.

33 2003 (OECD, Education at a Glance 2005).

34 IPSE, An evaluation of innovative approaches to teacher training on the Teach First Programme (2006).

35 Teach First targets graduates of the top universities in the United Kingdom, asking them to spend two years teaching. It then supports them in getting other jobs in the private sector after they had finished two years teaching. Not only are its teachers highly successful, but 47 percent of the first cohort decided to stay in teaching after the end of the two-year program.

36 Barber, Journeys of Discovery (2005).

37 Fullan, Hill, Crevola, Breakthrough (2006).

38 Interview: Boston, January, 2007.

39 Interview: Singapore, April, 2007.

40 Barber, Journeys of Discovery (2005).

41 Harvey-Beavis, Performance Based Rewards for Teachers (2003). CTAC, Catalyst for Change: Pay for Performance in Denver (2001).

42 Elmore, School Reform From The Inside Out (2004).

43 They stipulate 18 weeks for primary postgraduate certificate programs, 24 weeks for secondary and key stage 2/3 programs.

44 Chaney, Student outcomes and the professional preparation of 8th grade teachers, Goldhaber and Brewer, Does certification matter?

45 McBeath, Getting Districtwide Results (2006).

46 Interview: Boston, January, 2007.

47 See note 36.

48 NCSL, Seven Strong Claims about Successful School Leadership (2006).

49 Ofsted, School Inspection Data (2005/2006).

50 National Audit Office, Improving Failing Schools (2006).

51 NCSL, Seven Strong Claims about Successful School Leadership (2006).

52 NCSL, Seven Strong Claims about Successful School Leadership (2006).

53 DfES, Independent Study into School Leadership (2007).

54 Interview: Boston, January, 2007.

55 Chenoweth, from Lewis, Does Lesson Study have a future in the United States (2002).

56 Cuban, How teachers taught: Constancy and change in American classrooms, 1890-1980 (1984).

57 Michael Barber, lecture, London, 2007.

58 RAND, The Economics of Investing in Universal Preschool Education in California (2005).

59 Kati Haycock, Achievement in America: Can we close the gaps (2006).

60 Phone interview: Alberta, March, 2007.

61 Interview: Finland, March, 2007.

62 Interview: Boston, January, 2007.

63 Interview: Finland, March, 2007.

64 Currie, Thomas, Early Test Scores, Socioeconomic Status and Future Outcomes (1998).

65 Phone interview: May, 2006

66 Interview: New Zealand, May, 2006.

67 Ibid.

68 Michael Barber, op.cit.

69 Interview: Finland, March, 2007.

70 Hart and Risley, from New York Times "What it takes to Make a Student" (26 November 2006).

71 NCSL, Seven Strong Claims about Successful School Leadership (2006).

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