How the world’s best-performing school systems come out on top
The Challenge
Despite high spending increases in OECD, education outcomes have stagnated

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>65</td>
<td>-5</td>
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<td>United Kingdom</td>
<td>77</td>
<td>-8</td>
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<tr>
<td>Japan</td>
<td>103</td>
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<tr>
<td>Germany</td>
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<td>-5</td>
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<td>1</td>
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<tr>
<td>France</td>
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<td>-7</td>
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<tr>
<td>New Zealand</td>
<td>223</td>
<td>-10</td>
</tr>
<tr>
<td>Australia</td>
<td>270</td>
<td>-2</td>
</tr>
</tbody>
</table>

* Real expenditure, corrected for the Baumol effect using a price index of government goods and service
** Math and Science

Similarly, the US has experienced stagnant outcomes despite rising spend per student.

Source: National Centre for Education Statistics, NEAP, Hanushek (1998), McKinsey analysis
The skill impact of socio-economic differences is significant by as early as age four

Number of words (millions) heard by child at age four*

- Children of ‘professional’ parents: 45
- Children of ‘working class’ parents: 26
- Children of ‘welfare’ parents: 13

* Based on longitudinal research of 42 families in Kansas City
Source: Betty Hart and Todd Risley, 1995, McKinsey analysis
Popular reforms have not improved student outcomes: Class size

Of 112 studies that have examined the effects of class size on student achievement ...

- Significant positive effect of reduced class sizes: 9
- No significant effect of reduced class sizes: 89
- Significant negative effect of reduced class sizes: 14

“variations in teacher quality completely dominate any effect of altered class size”

Source: Hanushek *The Evidence on Class Size*, Akerhielm *Does class size matter*, McKinsey analysis
Popular reforms have not improved student outcomes: Autonomy

NAEP scores in reading for charter schools and public schools, Grade 4, 2003

Popular reforms have not improved student outcomes: Spend

<table>
<thead>
<tr>
<th>Country</th>
<th>PISA score relative to the international average</th>
<th>Cumulative spend per student 6-15 years, $US PPP, 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland</td>
<td>47</td>
<td>59,000</td>
</tr>
<tr>
<td>Sweden</td>
<td>12</td>
<td>68,000</td>
</tr>
<tr>
<td>Denmark</td>
<td>-4</td>
<td>75,000</td>
</tr>
<tr>
<td>Norway</td>
<td>-5</td>
<td>78,000</td>
</tr>
</tbody>
</table>

Source: OECD education at a glance (2005); Pisa 2003, McKinsey analysis
The Evidence
This is the theme of our recent publication: ‘How the world’s best-performing school systems come out on top’
We benchmarked 20 school systems, including ten of the world’s top performers

<table>
<thead>
<tr>
<th>Systems in the top ten in the OECD’s PISA (2003)¹</th>
<th>Systems with strong improvement trajectory ⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Alberta²</td>
<td>• Atlanta</td>
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<tr>
<td>• Australia</td>
<td>• Boston</td>
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<tr>
<td>• Belgium</td>
<td>• Chicago</td>
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<td>• Belgium</td>
<td>• England</td>
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<tr>
<td>• Finland</td>
<td>• Jordan</td>
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<td>• Hong Kong</td>
<td>• New York</td>
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<td>• Japan</td>
<td>• Ohio</td>
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<td>• Netherlands</td>
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<td>• New Zealand</td>
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<td>• Ontario²</td>
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<td>• Singapore³</td>
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<td>• South Korea</td>
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</tbody>
</table>

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
Lesson 1

“The quality of an education system cannot exceed the quality of its teachers.”

Source: McKinsey
Teacher quality is the most important lever for improving student outcomes

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 analysis
Great school systems attract great people into teaching

<table>
<thead>
<tr>
<th>Country</th>
<th>Teacher pool composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Korea</td>
<td>• The top 5 percent of graduates</td>
</tr>
<tr>
<td>• Finland</td>
<td>• The top 10 percent of graduates</td>
</tr>
<tr>
<td>• Singapore/Hong Kong</td>
<td>• The top 30 percent of graduates</td>
</tr>
</tbody>
</table>

Source: Interviews, McKinsey
Top-performing systems made it difficult to become a teacher: Finland

• **Check for minimum qualifications:**
  – Academically, applicants should be in the top 10% of their age cohort
  – Applicants should have completed relevant school and university education

• **Check skills**
  – Applicants must have a high level of literacy and numeracy

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• **Check attitude, aptitude and personality:**
  – Conducted by a panel of experienced headmasters
  – May include practical tests or activities

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• **Check attitude, aptitude and personality:**
  – Teachers are monitored during their initial teacher training for suitability as teachers
  – A small number of candidates who do not demonstrate the required standards are removed from the course

Source: Interviews, McKinsey
Top-performers carefully managed entry into the profession to maintain a high status (1/2)

High school or university (degree in a subject other than education) → Teacher training program → Teaching in a school

Option 1: Screen applicants here (Most top-performers)

Option 2: Screen applicants here (Most school systems)

Source: OECD Attracting Developing and retaining effective teachers; interviews, McKinsey
Top-performers paid good salaries, but not great salaries

Primary teacher salary as a % of GDP per capita

- **Starting salary**
  - Finland: 95
  - OECD: 95

- **Salary after 15 years**
  - Finland: 112
  - OECD: 131

- **Maximum salary**
  - Finland: 112
  - OECD: 159

Source: OECD Education at a glance 2005, McKinsey analysis
Top-performers position teaching as a prestigious profession: England

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**You could be earning £31.5K.**
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www.teach.gov.uk 0845 6000 991

Use your head. Teach.

Source: Training and Development Agency For Schools
Lesson 2

“The only way to improve outcomes is to improve instruction.”

Source: McKinsey
Improving teacher quality can have substantial impact in a short time frame (1/2)

There had been no improvement in literacy levels in English schools for 50 years. A strategic approach to raising teacher quality lead to significant improvements in just 3 years.

* Literacy levels prior to the introduction of national assessments were extrapolated from available data sources

Improving teacher quality can have substantial impact in a short time frame (2/2)

% of Boston students meetings the target standard in Grade 10 MCAS*

* Massachusetts state assessment exam
Source: Boston Public Schools, McKinsey analysis
**Top-performers took professional development inside the classroom**

**Professional Development in Shanghai and Japan**

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

| **Peer observation:** All teachers in Shanghai are required to visit and observe at least eight lessons by colleagues each term. The requirement makes visiting other teachers’ classrooms, observing their practice, and helping them to improve the norm in Shanghai schools |
| **Lesson study:** Teachers in both Shanghai and Japan 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
Lesson 3

“High performance requires every child to succeed.”

Source: McKinsey
## Inspections and examinations enable schools to continuously track their performance and improve

<table>
<thead>
<tr>
<th>School System</th>
<th>School review/inspections*</th>
<th>System-wide assessments**</th>
<th>School exit examinations**</th>
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<td>Singapore</td>
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* 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 analysis
Finland’s Special Education identifies students in need and provides them with intensive support

- Additional 1-on-1 or small group tuition to support those who are falling behind (called ‘special education’)
- 30% of all students will receive special education during any given year
- Most special education is focused on Mathematics and Finnish language
- Special education teachers receive an additional year of training and are paid slightly higher salaries
- Special education teachers work with a wider support team – psychologists, nurses, special needs advisors - to provide a comprehensive support

Source: Interviews, Thematic Review on Equality, McKinsey
Lesson 4

“Every school needs a great leader”
Top-performers recruit and train excellent school leaders: Singapore

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

6 month programme to develop new principals

- **Management and leadership courses** taken from leading executive training programmes

- **One day a week in schools** where candidates are assigned to develop innovative approaches to the toughest problems

- **Group projects** where candidates work in teams

- **2-week overseas placement** with a major corporation (e.g., IBM, HP, Ritz Carlton), where they shadow top private-sector executives

- **Rigorous evaluation** – only candidates who demonstrate the required competencies will succeed

Source: NIE, McKinsey
It is easy to create a few good schools, the challenge is to create a system that can deliver the same quality at scale

How to make 100,000 great math lessons happen simultaneously, every day, all over a country

A great math lesson

Source: McKinsey