

SABER | System Assessment and Benchmarking for Education Results

SABER-Teachers Background Paper No. 3

What Are the Teacher Policies of Top-Performing and Rapidly-Improving Education Systems?

Emiliana Vegas
Alejandro J. Ganimian

Education Sector
Human Development Network
The World Bank

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I. Introduction

There is increasing interest in policies that can improve teacher effectiveness.

Over the past decade, both developed and developing countries have become growingly concerned with how to raise the effectiveness of their teachers. This interest seems to have been sparked by a series of factors:¹

- Student achievement has been found to correlate with economic and social progress. A few influential studies have found that countries with higher student achievement in international exams have higher rates of economic growth and that those individuals who perform better earn higher wages.² Others have found that countries with better educated students have more consolidated democracies.³ This has convinced many of the potential importance of paying attention to students' learning outcomes.
- International assessments have identified countries that need to raise student learning. A considerable number of countries at various income levels have begun to participate in international student achievement tests. This has allowed them to compare the achievement of their students with that of their peers in other countries, and in many cases, to realize that their students were under-performing by world standards.
- Recent studies have shown teacher effectiveness is a key predictor of student learning. A number of studies that teacher effectiveness is the most important school-based predictor of student learning and that several consecutive years of outstanding

¹ This section draws on Bruns & Santibañez (2011). "Making Teachers Accountable." In B. Bruns, D. Filmer & H. A. Patrinos (Eds.) Making Schools Work: New Evidence on Accountability Reforms. Washington, DC: The World Bank.

² See, for example: Hanushek & Woessmann (2007). "Education Quality and Economic Growth." Washington, DC: The World Bank. Hanushek & Woessmann (2009). "Schooling, Cognitive Skills, and the Latin American Growth Puzzle." NBER Working Paper 15066. Cambridge, MA: National Bureau of Economic Research (NBER). Pritchett, L. & Viarengo, M. (2009). "Producing Superstars for the Economic Mundial: The Mexican Predicament with Quality of Education. PEPG Working Paper 09-01. Cambridge, MA: Program on Education Policy and Governance (PEPG).

³ See Barro, R. J. (1999). "Determinants of Democracy." The Journal of Political Economy. 107(S6): S158-S183. Campante, F. & Glaeser, E. L. (2009). "Yet Another Tale of Two Cities: Buenos Aires and Chicago." NBER Working Paper 15104. Cambridge, MA: National Bureau of Economic Research (NBER). Glaeser, E. L., Ponzetto, G. A. M. & Shleifer, A. (2007). "Why Does Democracy Need Education?" Journal of Economic Growth. 12: 77-99.

teaching can offset the learning deficits of disadvantaged students.⁴ This has made many realize of the potential of teacher policies to improve student learning.

Yet, evidence on the policies that raise teaching quality is incomplete and mixed.

Despite the growing demand for guidance on policies that raise teacher effectiveness, evidence from impact evaluation studies in this area is still uneven:⁵

- There is not enough evidence on many policies. For example, while many studies have sought to identify the ideal requirements to enter the teaching profession, research has found that the observable characteristics of teaching candidates (e.g., classroom experience, educational attainment or certification status) account for a very small share of variations in their effectiveness on the job.⁶ This is concerning because the more demanding a set of requirements is, the smaller and less diverse a teacher talent pool will be⁷ and teachers' race and gender seems to matter for student learning.⁸
- The impact of many reforms depends on specific features of their design. For example, while many rigorous evaluations of merit pay programs in low- and middle-income countries have found that they can produce positive and statistically significant gains in

⁴ Hanushek, E. A., & S. G. Rivkin. (2010). "Generalizations about Using Value-Added Measures of Teacher Quality." *American Economic Review*, 100 (2): 267–71. Hanushek, E. A., J. F. Kain, D. M. O'Brien, and S. G. Rivkin. 2005. "The Market for Teacher Quality." NBER Working Paper 11154. Cambridge, MA: National Bureau of Economic Research Working Paper (NBER). Rockoff, J. E. (2004). "The Impact of Individual Teachers on Student Achievement: Evidence from Panel Data." *American Economic Review*, 94(2), 247-252. Sanders, W. L., & Rivers, J. C. (1996). "Cumulative and Residual Effects of Teachers on Future Student Academic Achievement." Research Progress Report. Knoxville, TN: University of Tennessee Value-Added Research and Assessment Center.

⁵ This section draws on Bruns & Santibañez (2011). "Making Teachers Accountable." In B. Bruns, D. Filmer & H. A. Patrinos (Eds.) *Making Schools Work: New Evidence on Accountability Reforms*. Washington, DC: The World Bank. Umansky, I. (2005). "A Literature Review of Teacher Quality and Incentives." In Vegas, E. (Ed.) *Incentives to Improve Teaching. Lessons from Latin America*. Washington, DC: The World Bank.

⁶ Goldhaber, D. (2002). "The Mystery of Good Teaching: Surveying the Evidence on Student Achievement and Teachers' Characteristics." *Education Next*, 2(1), 50-55. Kane, T. J., Rockoff, J. E., & Staiger, D. O. (2006). "What Does Certification Tell Us About Teacher Effectiveness? Evidence from New York City." NBER Working Paper 12155. Cambridge, MA: National Bureau of Economic Research (NBER). Rivkin, S. G., Hanushek, E. A., & Kain, J. F. (2005). "Teachers, Schools and Student Achievement." *Econometrica*, 73(2), 417-458.

⁷ Hanushek, E. A., & Pace, R. R. (1994). "Understanding Entry into the Teaching Profession." In R. G. Ehrenberg (Ed.), *Choices and Consequences: Contemporary Policy Issues in Education*. Ithaca, NY: ILR Press. Hanushek, E. A., & Pace, R. R. (1995). "Who Chooses to Teach (and Why)?" *Economics of Education Review*, 14(2), 101-117.

⁸ Dee, T. S. (2001). "Teachers, Race and Student Achievement in a Randomized Experiment." NBER Working Paper 8432. Cambridge, MA: National Bureau of Economic Research (NBER). Dee, T. S. (2005). "Teachers and the Gender Gaps in Student Achievement." NBER Working Paper 11660. Cambridge, MA: National Bureau of Economic Research (NBER).

student achievement,⁹ others have cautioned that the method used to evaluate teacher performance, the level at which incentives are awarded (i.e., individual or group), the size of the incentives and how well they are tied to the behaviors they seek to elicit influence the impact of these merit pay programs.¹⁰

- The same policies can have very different impacts in different contexts. For example, while alternative pathways into teaching such as Teach for America have been found to have limited impact on student achievement in the United States,¹¹ the question of whether they may, given a certain scale and time period, lead to improvements in student learning remains to be answered. In addition, a recent study of a similar initiative in Latin America suggests that alternative pathways into teaching could have a considerable impact in raising student learning in some countries.¹²

⁹ Duflo, E., R. Hanna, and S. Ryan. (2010). "Incentives Work: Getting Teachers to Come to School." Unpublished manuscript, Abdul Latif Jameel Poverty Action Lab (JPAL), Massachusetts Institute of Technology, Cambridge, MA. Glewwe, P., N. Ilias, and M. Kremer. 2010. "Teacher Incentives." *American Economic Journal: Applied Economics* 2 (3): 205–27. Lavy, V. (2002). "Evaluating the Effect of Teachers' Group Performance Incentives on Pupil Achievement." *The Journal of Political Economy* 110 (6): 1286–317. Lavy, V. (2009). "Performance Pay and Teachers' Effort, Productivity, and Grading Ethics." *The American Economic Review* 99 (5): 1979–2011. Muralidharan, K., and V. Sundararaman. (2009). "Teacher Performance Pay: Experimental Evidence from India." National Bureau of Economic Research Working Paper 15323, NBER, Cambridge, MA. Rau, T., and D. Contreras. (2009). "Tournaments, Gift Exchanges, and the Effect of Monetary Incentives for Teachers: The Case of Chile." Department of Economics Working Paper 305, University of Chile, Santiago.

¹⁰ Ahn, T., & Vigdor, J. (2010). "The Impact of Incentives on Effort: Teacher Bonuses in North Carolina." PEPG Working Papers Series. Cambridge, MA: Program on Education Policy and Governance (PEPG). Bacolod, M. P., DiNardo, J., & Jacobson, M. (2009). "Beyond Incentives: Do Schools Use Accountability Rewards Productively?," NBER Working Paper 14775. Cambridge, MA: National Bureau of Economic Research (NBER). Ballou, D. (2001). "Pay for Performance in Public and Private Schools." *Economics of Education Review*, 20(1), 51-61. Eberts, R. W. (2002). "Teacher Performance Incentives and Student Outcomes." *Journal of Teacher Education*, 37(4), 913-927. Murnane, R. J., & Cohen, D. K. (1986). "Merit Pay and the Evaluation Problem: Why Most Merit Pay Plans Fail and Few Survive." *Harvard Educational Review*, 56(1), 379-388. Podgursky, M., & Springer, M. G. (2008). "Teacher Performance Pay: A Review." *Journal of Policy Analysis and Management*, 24(4), 909-949.

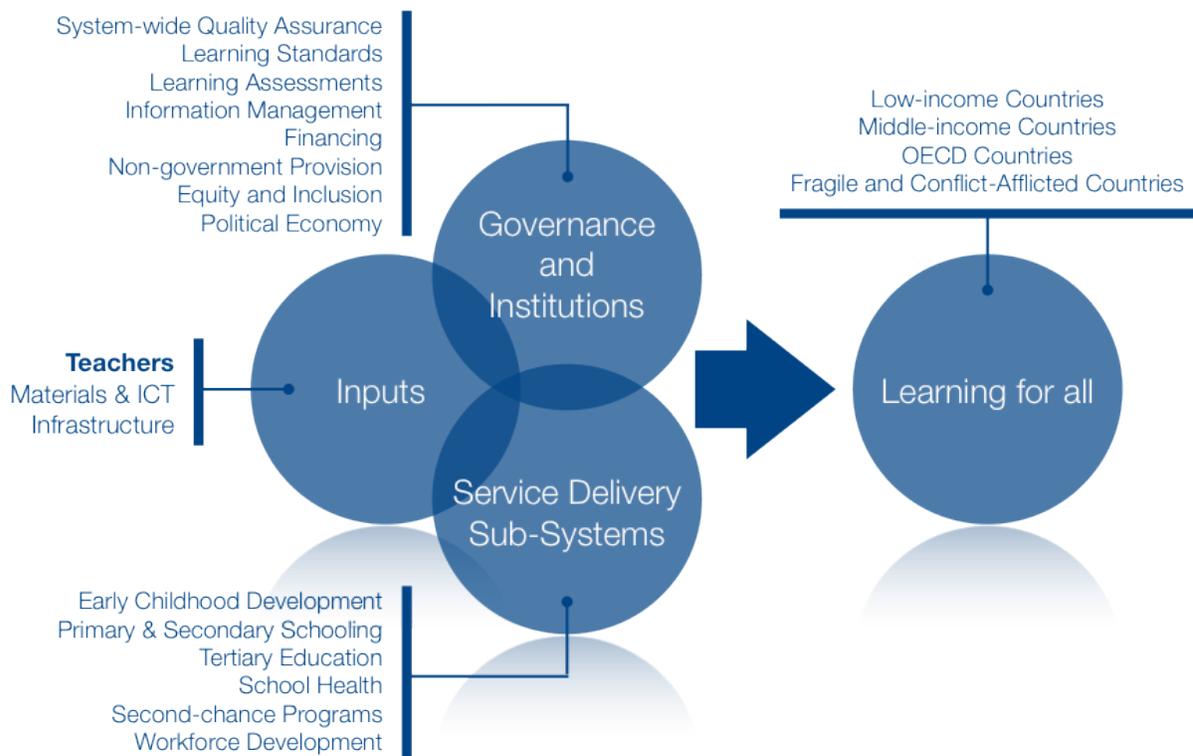
¹¹ Boyd, D., Grossman, P., Lankford, H., Loeb, S., & Wyckoff, J. (2006). "How Changes in Entry Requirements Alter the Teacher Workforce and Affect Student Achievement." *Education Finance and Policy*, 1(2), 176-216. Boyd, D., Hammerness, K., Lankford, H., Loeb, S., Ronfeldt, M., & Wyckoff, J. (2009). "Recruiting Effective Math Teachers, How Do Math Immersion Teachers Compare?: Evidence from New York City." New York, NY: National Center for the Analysis of Longitudinal Data in Education Research (CALDER). Darling-Hammond, L., Holtzman, D., Gatlin, S. J., & Vazquez Hellig, J. (2005). "Does Teacher Preparation Matter? Evidence About Teacher Certification, Teach for America and Teacher Effectiveness." *Education Policy Analysis Archives*, 13(42). Decker, P. T., Mayer, D. P., & Glazerman, S. (2004). *The Effects of Teach For America on Students: Findings from a National Evaluation*. Princeton, NJ: Mathematica Policy Research, Inc. Xu, Z., Hannaway, J., & Taylor, C. (2007). "Making a Difference? The Effects of Teach for America in High School." National Center for Analysis of Longitudinal Data in Education Research (CALDER), Urban Institute.

¹² Alfonso, M., Santiago, A., & Bassi, M. (2010). "An Alternative Pathway into Teaching: Placing Top University Graduates in Vulnerable Schools in Chile." Washington, DC: Inter-American Development Bank.

The Human Development Network’s Education Sector at the World Bank has launched an initiative called SABER to fill the gap in data on education policies.

This effort, called System Assessment and Benchmarking for Education Results (SABER), seeks to collect, analyze and disseminate data on education policies in developed and developing countries. SABER includes the main education policy domains at all levels of education services, from finance to learning assessments, learning standards to early childhood development (**Figure I.1**). SABER-Teachers focuses on developing tools to collect, analyze, and disseminate information on teacher policies around the world.

Figure I.1: SABER Overview



Source: Authors’ elaboration.

SABER-Teachers collects data on ten comprehensive teacher policy areas.

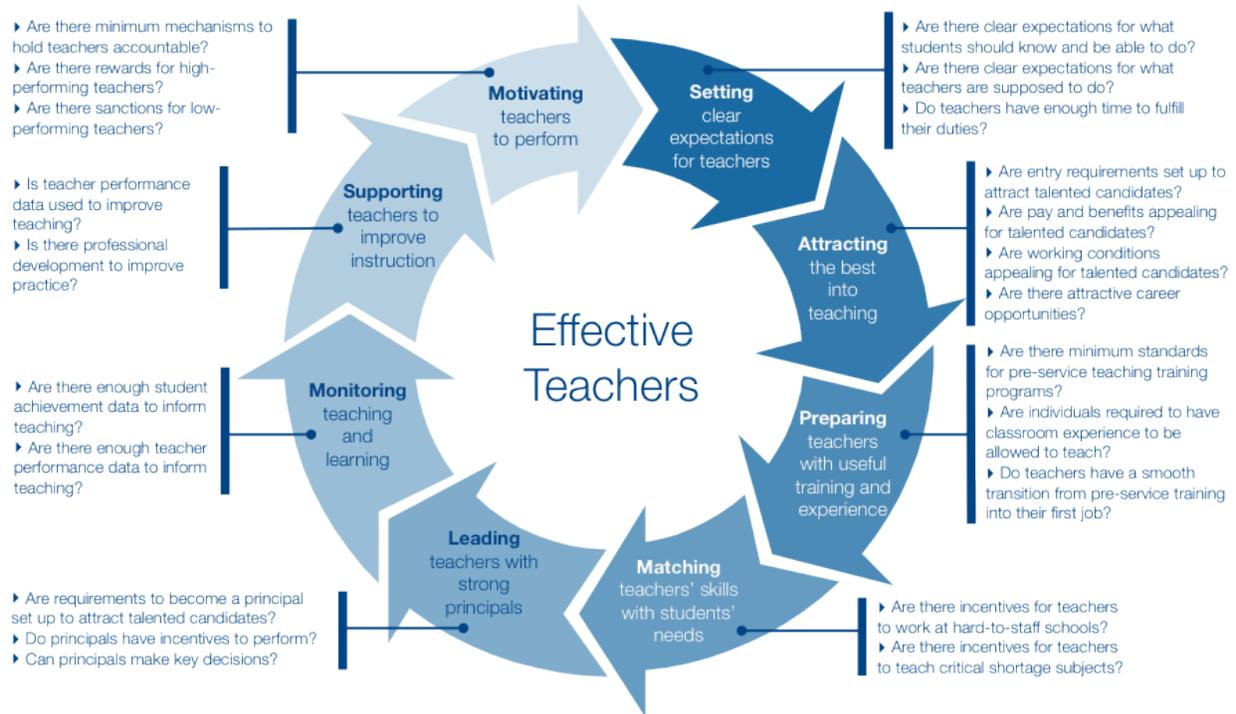
These areas include: (i) requirements to enter and remain in teaching; (ii) initial teacher preparation; (iii) recruitment and employment; (iv) teacher workloads and autonomy; (v) professional development; (vi) compensation: salary and non-salary benefits; (vii) retirement rules and benefits; (viii) monitoring and evaluation of teacher quality; (ix) teacher representation and voice; and (x) school leadership. Data are collected by expert

consultants who interview key informants, compile legal documents and quantitative information and complete a set of standard questionnaires.¹³

SABER-Teachers classifies education systems according to eight policy goals.

These goals were identified through a review of the evidence and expert opinion. They are linked to teaching and learning through theory or evidence, they are a priority for resource allocation and they are actionable by governments. These goals include: (i) setting clear expectations for teachers; (ii) attracting the best into teaching; (iii) preparing teachers with useful training and experience; (iv) matching teachers’ skills with students’ needs; (v) leading teachers with strong principals; (vi) monitoring teaching and learning; (vii) supporting teachers to improve instruction; and (viii) motivating teachers to perform. Each goal is linked to policy levers—actions that governments can take to improve (**Figure I.2**). Levers are in turn linked to indicators, which are listed in **Table A.1** in the Annex.¹⁴

Figure I.2: SABER-Teachers Policy Goals and Levers



Source: Authors’ elaboration.

¹³ For more information on the selection of these teacher policy areas, see Vegas, E., Loeb, S., Romaguera, P., Paglayan, A. S., Goldstein, N. & Ganimian, A. J. (2011). “SABER-Teachers. Objectives, Rationale, Methodological Approach and Products.” Washington, DC: The World Bank.

¹⁴ For more information on the selection of these teacher policy goals, see Vegas, E. & Ganimian, A. J. (2011). “What Are Teacher Policy Goals, How Can Education Systems Reach Them and How Will We Know When They Do?” Washington, DC: The World Bank.

SABER-Teachers disseminates its data and analysis through user-friendly tools.

The main tool has been a 10-page country report, which classifies an education system according to its performance on each of the eight teacher policy goals and draws on the data collected on that system to discuss the reasons behind its good or bad performance. Each report also include an overview of the key challenges of the education system, the student and teacher population, the level of (de)centralization of the education system and the profile and role of teacher organizations. The other main tool, soon to be released, will be a global database of all the data collected by SABER-Teachers that will allow education systems to compare its policies with those of others. In addition, the website will feature all the country reports, comparative analyses and teacher policy regulations **(Figure I.3)**.

Figure I.3: SABER-Teachers Website



Source: Authors' elaboration.

II. Why Is There a Need to Review the Teacher Policies of Successful Education Systems?

A number of studies have sought to map out the policies of successful systems, but they vary considerable in their approaches, making them hard to reconcile.

Researchers and policy analysts have responded to the increase in demand for data and analysis on teacher policies in successful schools systems by producing various reports on how these systems attract develop and motivate effective teachers. We list these reports in **Table A.1** in the Appendix.¹⁵ While very useful in mapping teacher policies, existing studies vary widely in their methodologies, making it difficult to draw general conclusions about the teacher policies of top-performing and rapidly-improving systems. More specifically:

- They vary in the number of systems that they cover. Some offer in-depth and detailed knowledge about a specific system’s practices and others provide policy metrics that are comparable across many systems.
- They vary in the extent to which they deliberately select successful systems. Some studies seem to have selected these systems based primarily on the availability of information, while others have employed explicit methodologies to carefully identify successful education systems.
- They vary in the rigor of their methodology. Some are more illustrative and employ unstructured interviews while others make an effort to systematize policy data, use not only cross-sectional but also longitudinal data and triangulate data sources.

While the choices the authors of these reports may serve a specific purpose, none of these reports offers a comprehensive picture of teacher policies in successful education systems. This paper builds on this previous literature to provide a more complete overview of teacher policies in top-performing and rapidly-improving education systems.

III. How Should We Identify Top-Performing and Rapidly Improving Systems?

The methodology to identify successful education systems has evolved over time.

Many “benchmarking” studies identify top performers and rapid improvers by looking at the rankings of the most recent international student achievement tests (ISATs).¹⁶ Recently,

¹⁵ Importantly, not all of these studies focus exclusively in top-performing and rapidly-improving education systems, but all of them feature these systems. Also, note that the “teacher policies” column summarizes only the findings of these studies that are directly related to teacher policies.

¹⁶ The authors of this article proposed a more systematic approach to using rankings in Vegas, E. & Ganimian, A. J. (2011). “Identifying Successful Education Systems Using International Student Achievement Tests: An Exercise for SABER Sub-System Work.” Washington, DC: The World Bank.

several researchers have been working on more rigorous ways to identify successful systems, using the following approaches:¹⁷

- Converting scores from international exams into a single universal scale. Eric Hanushek and Dennis Kimko¹⁸ were pioneers in developing a measure of student achievement comparable across countries using math and science scores from the 1964 First International Mathematics Study (FIMS), the 1970 First International Science Study (FISS), the 1980 Second International Mathematics Study (SIMS), the 1983 Second International Science Study (SISS) and the 1988 and 1991 editions of the International Assessment of Educational Progress (IAEP).¹⁹ The authors employ two approaches. First, they use a multiplicative transformation to make each ISAT series (i.e., each set of data for a given age, subject and year) have the same mean. In so doing, the authors make the non-trivial assumption that the mean of these series does not change across time and that countries taking the test are a random sample from the world distribution. Second, they exploit the fact that the United States has had a comparable test over time, the National Assessment of Education Progress (NAEP) and has participated in all of the ISATs mentioned above. They anchor the scores of U.S. students in ISATs to their NAEP scores and allow the mean for each ISAT to vary with the US NAEP variations. Thus, the measures of learning that they employ are simply the weighted average over all available transformed test scores where weights are the normalized inverse of the country-specific standard error.
- Developing a common metric for the variation of test scores of ISATs. Eric Hanushek and Ludger Woessmann²⁰ built on previous efforts by taking a different approach to achieve comparability in cross-country performance variation across the FIMS, FISS, SIMS and SIMS as well as the 1970 First International Reading Study, the 1990 Second International Reading Study, the 1995, 1999 and 2003 installments of the Trends in International Mathematics and Science Study (TIMSS), the 2001 Progress in International Reading Literacy Study (PIRLS) and the 2000 and 2003 Programme for

¹⁷ **Table A.2** in the Appendix includes key information on all assessments mentioned below.

¹⁸ Hanushek, E. A. & Kimko, D. D. (2000). "Schooling, Labor-Force Quality and the Growth of Nations." *American Economic Review*. 90(5): 1184-1208.

¹⁹ For more details, see Hanushek, E. A. & Kim, D. (1995). "Schooling, Labor Force Quality and Economic Growth." NBER Working Paper 5399. Cambridge, MA: National Bureau of Economic Research (NBER).

²⁰ Hanushek, E. A. & Woessmann, L. (2010). "The High Cost of Low Educational Performance. The Long-Run Economic Impact of Improving PISA Outcomes." Paris, France: Organisation for Economic Co-operation and Development (OECD).

International Student Assessment (PISA).²¹ They selected a group of countries that have participated in several ISATs and across which it is reasonable to expect relative constancy in the size of cross-country variation in test scores. Under this assumption, the authors use this group of countries to develop a comparable scale for the variation on the different ISATs by projecting the standard deviation among those in the group that participated in any given ISAT from a subject-specific PISA test onto the particular ISAT. The transformed test score of each country for each age, subject and year has a mean of zero and a between-country standard deviation that is the same as the standard deviation of the same countries in the corresponding PISA test. Yet, even when taking this approach, the authors still rely on the comparable evidence of the performance of the US mentioned above to set a common level for the different ISATs.

- Incorporating regional student achievement tests with no US participation. Nadir Altinok and Hatidje Murseli²² rightly pointed out that the previous two approaches are limiting in that they necessarily exclude regional student achievement tests (RSATs) in which the US has not participated (because they rely on concurrent US participation in NAEP and ISATs to make the level of the ISATs comparable). The authors resolved this problem by taking two different approaches to tests with and without US participation and are able to incorporate the results from the 1997 First Regional Comparative and Explanatory Study (PERCE), the 1995-2006 editions of the Programme on Analysis of Education Systems (PASEC), the 1999 and 2002 Southern and Eastern Africa Consortium for Monitoring Educational Quality and the 1992-1997 rounds of the Monitoring Learning Achievement (MLA).²³ For the ISATs with US participation, they followed the same method as that of Hanushek and Woessmann and obtained panel data for the 1964-2005 period. For the RSATs without US participation, they exploited the fact that some systems have participated in both RSATs and ISATs (they call these the “doubloon” countries). They do so by first computing the average result of a group of doubloon countries for each age group, subject and RSAT. Then, they compute the average performance of these doubloon countries for each age group, subject and ISAT in which the US has participated. Next, they calculate the ratio of the first set of

²¹ Mourshed, Chijioke and Barber used the same approach to incorporate results from the 2006 rounds of PISA and PIRLS, the 2007 installment of TIMSS and the California Academic Performance Index (API). The authors had no way of incorporating the results from India’s Assessment Survey Evaluation Research (ASER) for 2006-2008 or Brazil’s Index of Development of Basic Education (IDEB) for 2005, 2007 and 2009 into the universal scale. They therefore make educated guesses about the relative performance of these countries. See Mourshed, M., Chijioke, C. & Barber, M. (2010). “How the World’s Most Improved Education Systems Keep Getting Better.” London, UK: McKinsey & Co.’s Social Sector Office.

²² Altinok, N. & Murseli, H. (2007). “International Database on Human Capital Quality.” *Economic Letters*. 96: 237-244.

²³ Schlotter used the same approach to incorporate the 2006 Second Regional Comparative and Explanatory Study and the 2007 TIMSS. See Schlotter, M. (2010). “The Relationship between Human Capital Quality, Governance and Educational Institutions. First Steps towards a Panel Approach.” Washington, DC: The World Bank.

values over the second set of values to get an index of the difficulty level of the RSAT relative the ISAT. Finally, they multiply the original scores of each RSAT with its corresponding difficulty index. This process effectively converts the score for each RSAT into one that is comparable to an ISAT with US participation.

- Accounting for recent developments in the comparability of ISATs. In a recent paper, Nadir Altinok, Claude Diebolt and Jean-Luc De Meuleester²⁴ improve upon previous studies by taking four different approaches to analyzing different sets of student achievement data. This allows them to incorporate results from the 2007-2009 PASEC, 2006 PIRLS, 2006 PISA and 2007 TIMSS exams and from the 200 Second Regional Comparative and Explanatory Study (SERCE). First, for ISATs with US participation until 2001 inclusive, the authors use the same method as Hanushek and Woessmann. Second, for ISATs with US participation after 2001, the authors take note of the fact that recent tests have been designed to permit analysis of country score trends and that any adjustment of the scores of these tests using the Hanushek and Woessmann methodology might distort the analysis of country performance trends. Therefore, rather than recalculating the adjustment coefficients for these tests, the authors use the same coefficients as those for tests prior to 2001 in order to achieve a single linear conversion of country scores. Third, for RSATs without US participation, they use the same method as the Altinok and Murseli study for this group of education systems. The authors end up with what they call “the most complete database on human capital quality” to date, including: (i) a set of data that allows comparison of student achievement across countries through an average universal score for the 1965-2007 period; (ii) a dataset that permits comparison of the global change in student achievement over a relatively long period of time (1970-2007); (iii) another dataset that allows analysis of short-term trends in their universal scores (between 1995 and 2007); and (iv) a composite of these three datasets that enables to test for significant changes in student achievement across countries over time.

We use the most up-to-date of these databases to identify successful systems.

Using the Altinok, Diebolt and Meuleester databases, we classify 20 education systems into four groups: (a) top-performing and rapidly-improving; (b) top-performing; (c) rapidly-improving (long-term); and (d) rapidly-improving (short-term) (**Tables A.3** through **A.5** in the Appendix show the top 10 education systems in the historical measure of quality, improvements over the long term and improvements over the short term):²⁵

- a. Top-performing and rapidly-improving: These are the top 5 performers in the general universal scale (i.e., combining primary and secondary) with either long-term or short-term but statistically significant improvements in this scale.

²⁴ Altinok, N., Diebolt, C. & De Meuleester, J.-L. (2010). “International Database on Human Capital Quality: An Update.” Mimeo. Bourgogne, France.

²⁵ These results should be interpreted as tentative since this paper is currently being updated.

- Hong-Kong (China)
 - Canada
 - Finland
 - Belgium
 - South Korea
- a. Top-performing: These are the top 5 performers in the general universal scale (i.e., combining primary and secondary), excluding repeat countries from the previous group.
- Japan
 - Taipei (China)
 - Hungary
 - Singapore
 - Netherlands
- b. Rapidly-improving (long-term): These are the top 5 improvers in the general universal scale (i.e., combining primary and secondary) in the 1970-2007 period, excluding repeat countries from the previous groups.
- Chile
 - Iran
 - Luxembourg
 - Israel
 - New Zealand
- c. Rapidly-improving (short-term): These are the top 5 statistically significant improvers in the general universal scale (i.e., combining primary and secondary) in the 1995-2007 period, excluding repeat countries from the previous groups.
- Ghana
 - Armenia
 - Lebanon
 - Mexico
 - Indonesia

IV. How Do Successful Education Systems Fare on the SABER-Teachers Policy Goals?

This section looks at how successful systems fare on the SABER-Teachers goals.

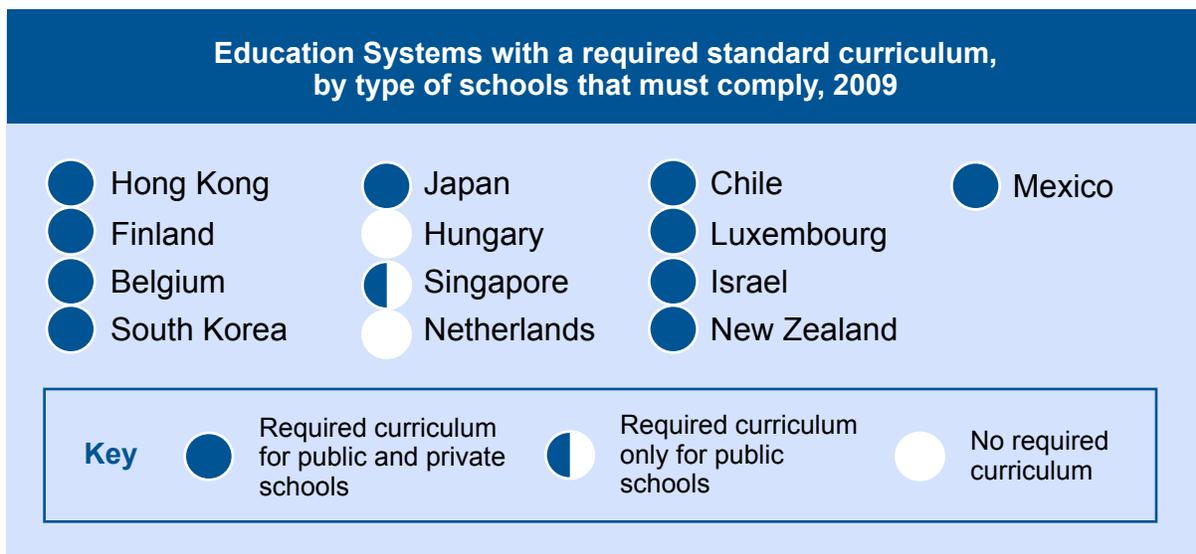
Drawing on previous “benchmarking” studies, this paper seeks to understand how top-performing and rapidly-improving education systems perform on the SABER-Teachers policy goals and levers, outlined in Figure 1.2 above. To do this, a series of specific and measurable indicators have been identified, which provide evidence of the extent to which an education system has introduced policies or regulatory frameworks to achieve each of the core SABER teacher policy goals. While for the purposes of this paper, we must rely on

existing data, the analysis will eventually be complemented with data collected by SABER-Teachers. Indeed, not all indicators in the SABER-Teachers policy goals are included here, as data were available for 62% (or 59 of the 96) indicators used in the SABER rubric.

1. Setting Clear Expectations for Teachers

- a. Are there clear expectations for what students should know and be able to do?
 i. *Is there one or more curricula?*

With the exception of Hungary and the Netherlands, a majority of successful education systems with data have a required curriculum for public and private schools. In the case of Singapore, the requirement affects only public schools.



Source: OECD (2010), *PISA 2009 Results: What Makes a School Successful?* Table IV.3.7.
 Note: Private schools here include either government-dependent or independent private schools.

- ii. *Are there standards for what students must know and be able to do?*

No data were available on this indicator. SABER-Teachers will collect these data.

- b. Are there clear expectations for what teachers are supposed to do?
 i. *Are the tasks that teachers are expected to carry out officially stipulated?*

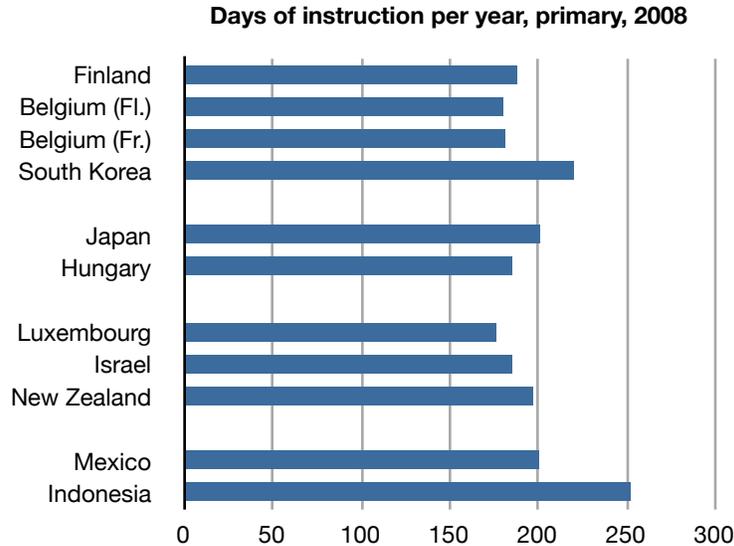
No data were available on this indicator.

- ii. *Are there performance goals for teachers?*

No data were available on this indicator.

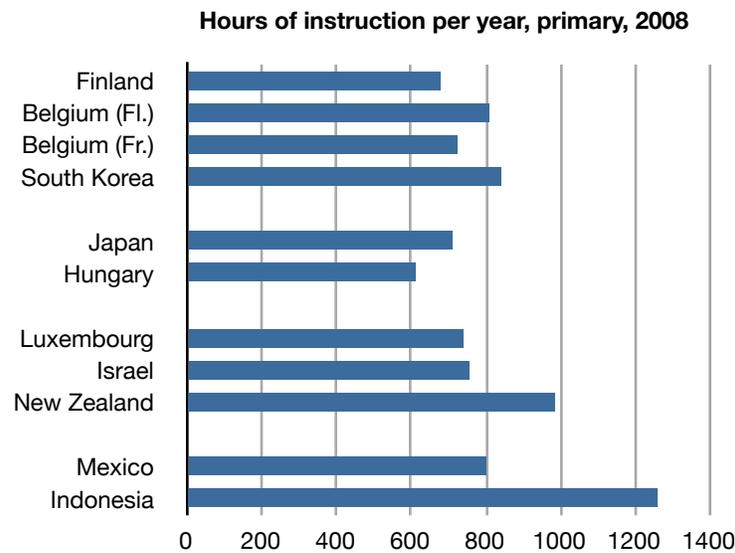
- c. Do teachers have enough time to fulfill their duties?
 i. *How long is the school year at the primary level?*

With the exception of South Korea and Indonesia, all successful education systems with data have between 150 and 200 required days of instruction per year at the primary level. South Korea and Indonesia have between 200 and 250.



Source: OECD (2010). *Education at a Glance 2010*. Table D4.1.

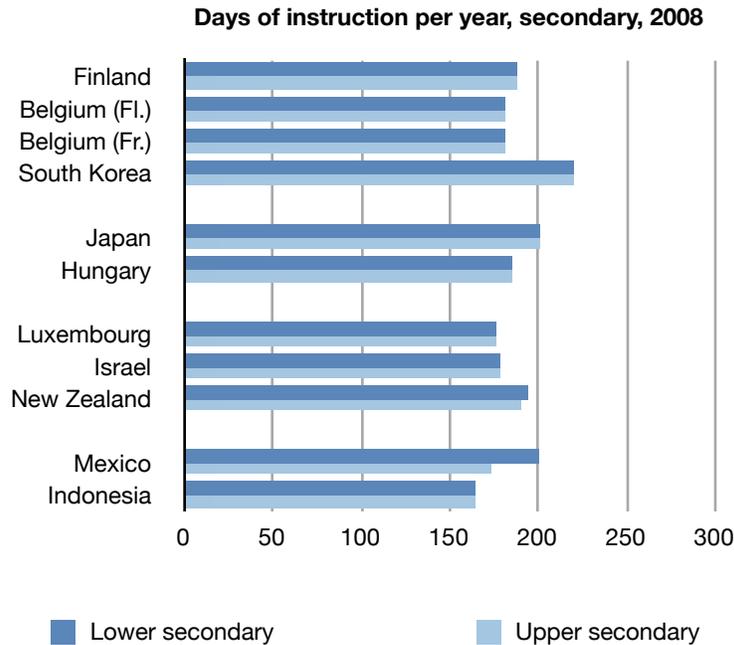
There is also considerable convergence among successful education systems in the number of required hours of instruction per year at the primary level. Most have roughly between 600 and 800 hours per year. The two outliers are New Zealand, with nearly 1000 hours and Indonesia, with over 1200 hours per year at this level.



Source: OECD (2010). *Education at a Glance 2010*. Table D4.1.

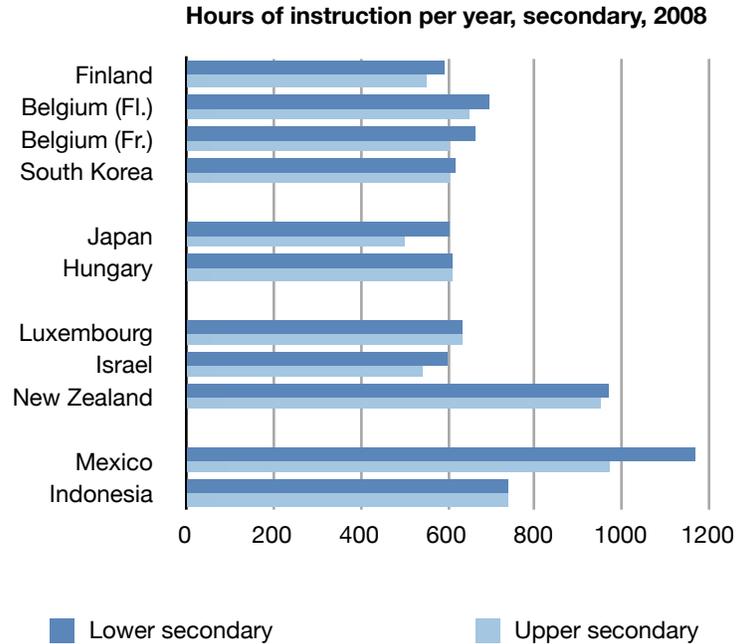
ii. How long is the school year at the secondary level?

There is also a clear convergence among successful systems in the required days of instruction at the secondary level. All successful education systems with data have between 150 and 200 days of instruction, with South Korea having a slightly higher number at 220 required days of instruction per year.



Source: OECD (2010). *Education at a Glance 2010*. Table D4.1.

There is also a fair amount of convergence in the number of hours of instruction at the secondary level. Most successful education systems have between 550 and 650 hours of instruction. The only three exceptions are New Zealand and Mexico, with 900-1200 hours, and Indonesia, with just over 700 hours and closer to the general trend.



Source: OECD (2010). *Education at a Glance 2010*. Table D4.1.

iii. Does the statutory definition of working time for primary school teachers recognize non-teaching hours?

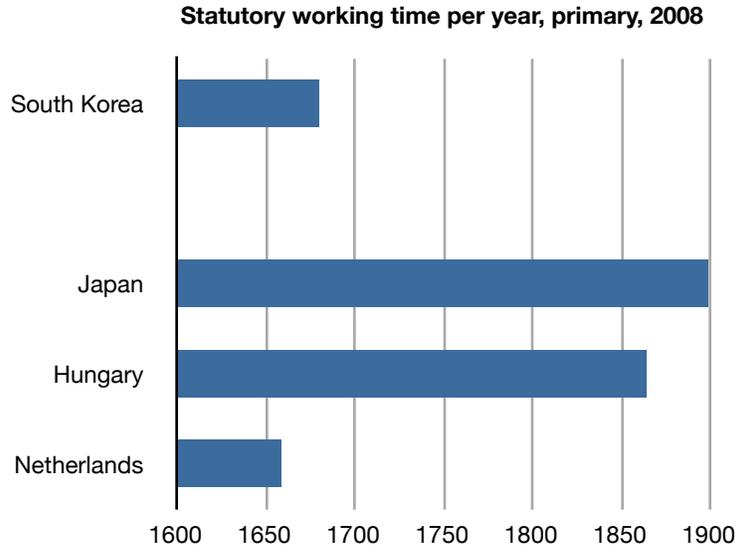
No data were available on this indicator.

iv. Does the statutory definition of working time for secondary school teachers recognize non-teaching hours?

No data were available on this indicator.

v. How long is primary school teachers' working time per year (hours)?

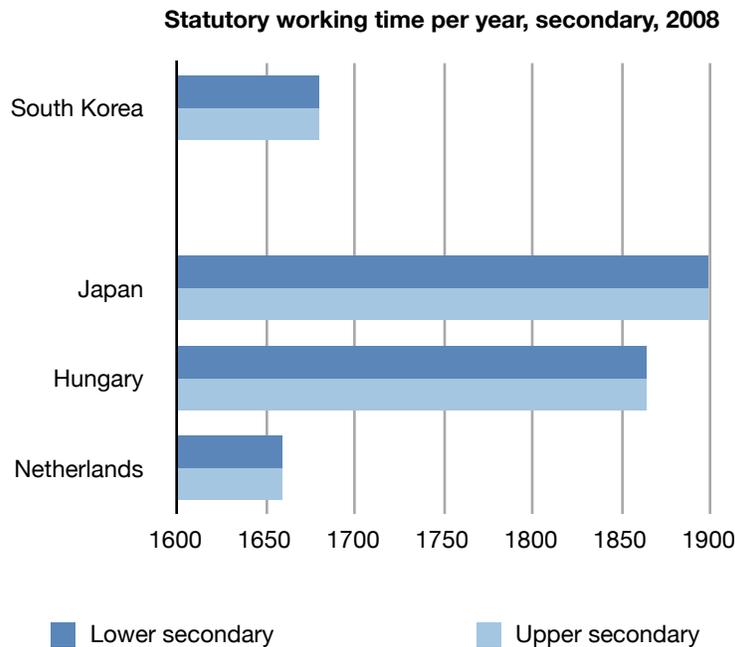
Not many education systems report the number of hours they devote to statutory working time. Korea and the Netherlands have between 1650 and 1700 hours, and Japan and Hungary have between 1850 and 1900. It is possible, however, that these differences are due to the ways in which statutory working time is defined in these countries.



Source: OECD (2010). *Education at a Glance 2010*. Table D4.1.

vi. How long is secondary school teachers' working time per year (hours)?

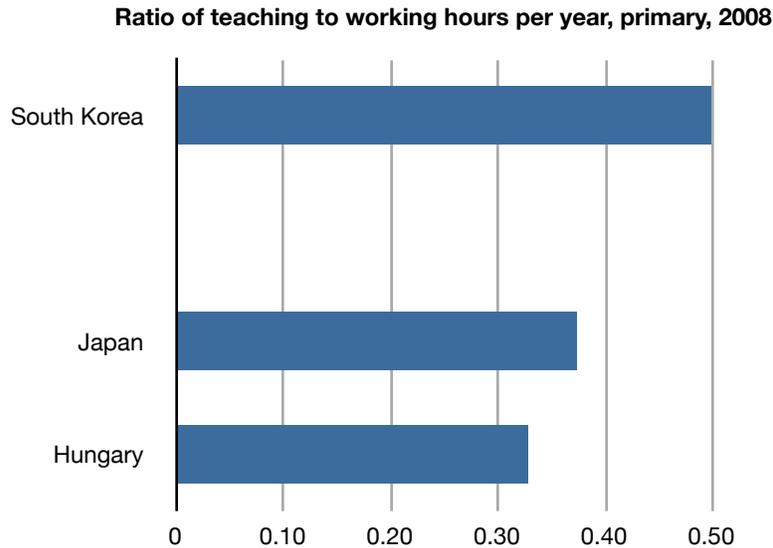
The same trend emerges at the secondary level. Again, South Korea and the Netherlands have between 1650 and 1700 statutory working hours per year while Japan and Hungary have 1850-1900 hours.



Source: OECD (2010). *Education at a Glance 2010*. Table D4.1.

vii. What is the share of working time allocated to teaching for primary school teachers?

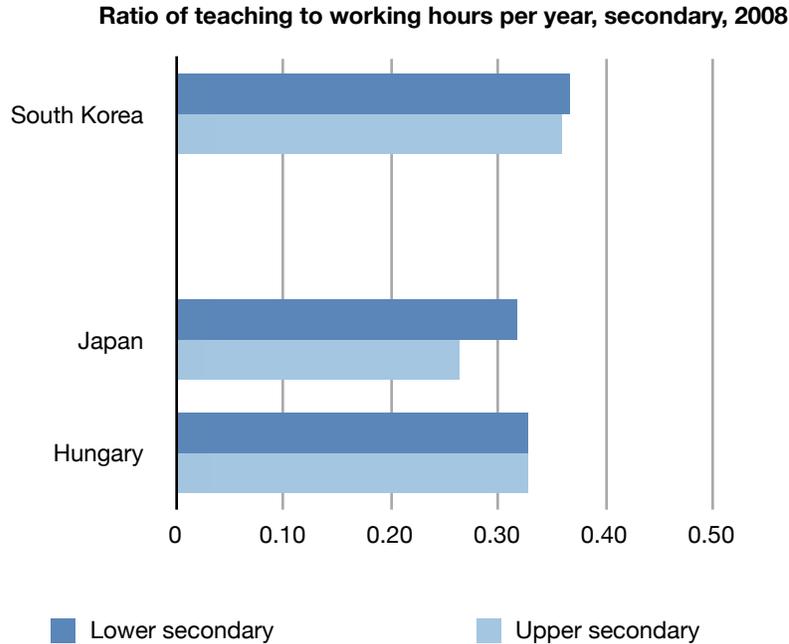
Data on the ratio of teaching to working hours is scarce, as it requires comparable information on both measures and few countries report it. Yet, those countries that do make teaching hours 30 to 50% of working hours, suggesting that they all built in time for other tasks that teachers need to carry out, such as administrative duties and grading assignments, among others.



Source: OECD (2010). *Education at a Glance 2010*. Table D4.1.

viii. What is the share of working time allocated to teaching for secondary school teachers?

A similar pattern to that above emerges at the secondary level. Successful education systems with data devote between 25 and 40% of their working time to teaching. This might reflect the fact that, at this level, teachers have more responsibilities outside the classroom.



Source: OECD (2010), Education at a Glance 2010. Table D4.1.

2. Attracting the Best into Teaching

a. Are entry requirements set up to attract talented candidates?

i. *Is there an established process to screen applicants to pre-service teacher training?*

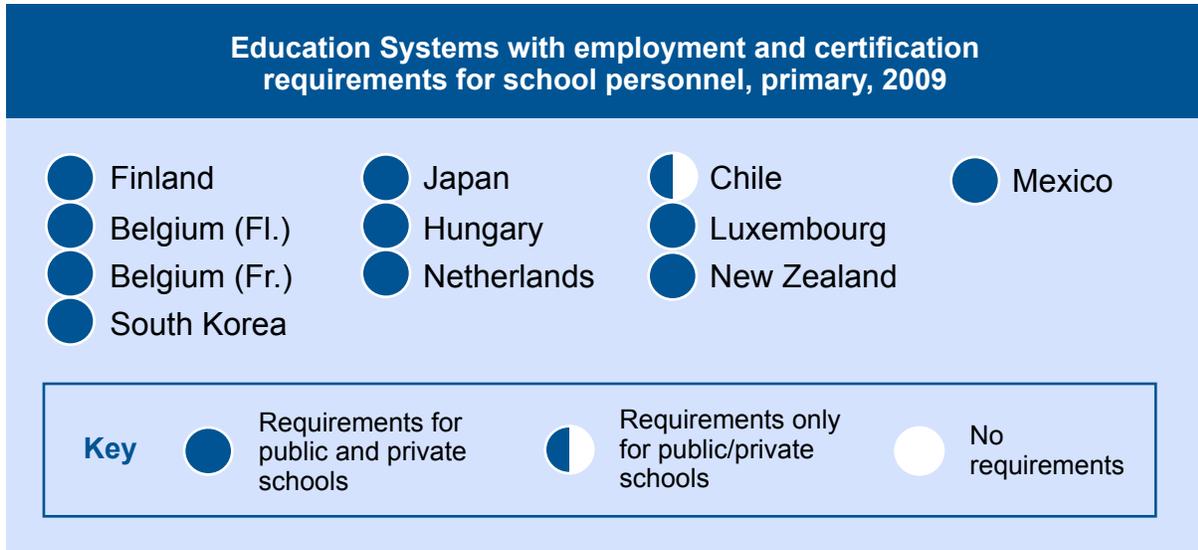
No data were available on this indicator.

ii. *How many applicants enter pre-service teacher training programs?*

No data were available on this indicator.

iii. *Are there requirements to become a primary school teacher?*

Limited data exist on the specific question of whether successful education systems have entry requirements for primary school teachers. Successful education systems with data have employment and certification requirements for public primary school personnel (including teachers), and except in Chile, these requirements also apply to private primary school teachers.

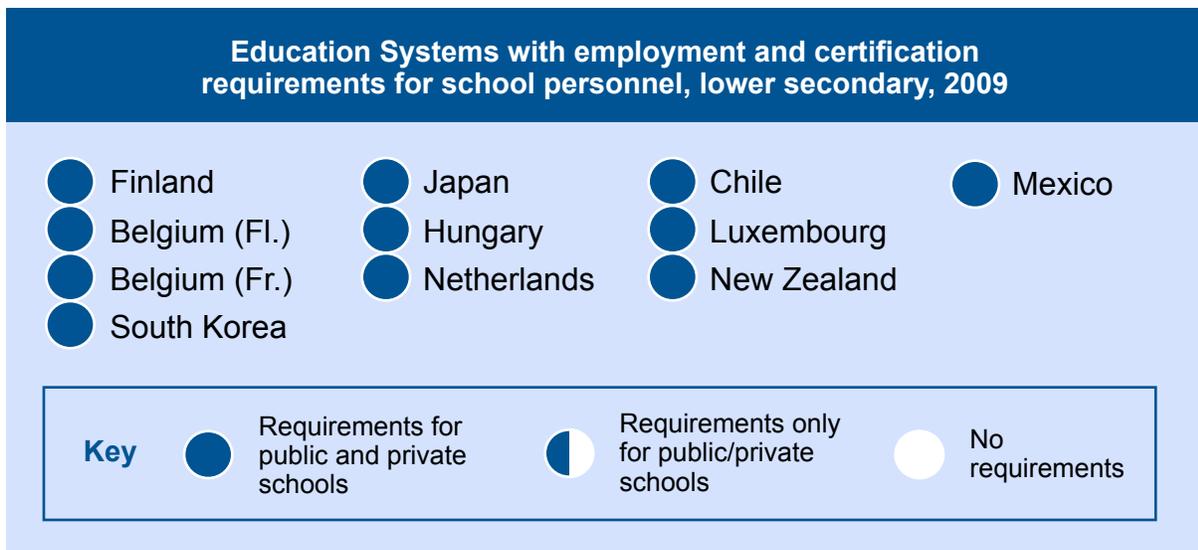


Source: OECD (2010). *Education at a Glance 2010*. Table D.5.4.

Note: Private schools here include either government-dependent or independent private schools.

iv. Are there requirements to become a secondary school teacher?

Similarly, at the secondary school level, all successful education systems with data have employment and certification requirements for school personnel, without any exceptions.



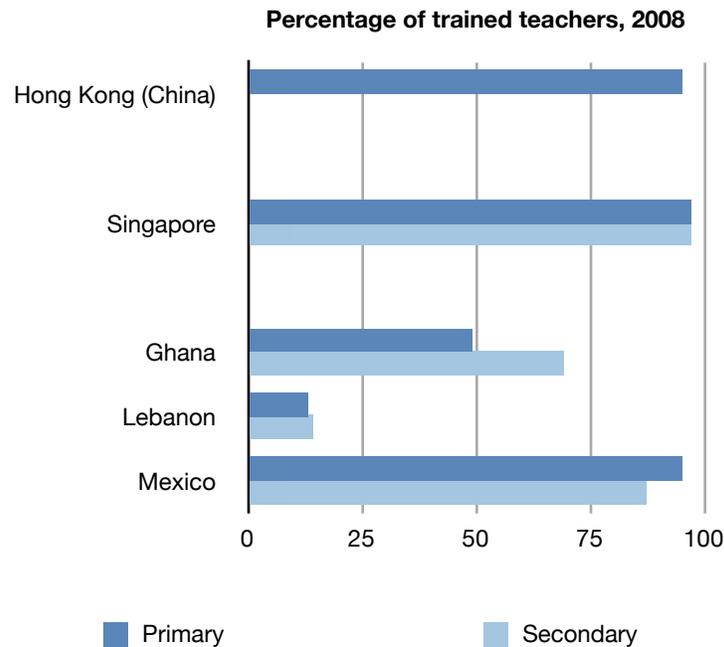
Source: OECD (2010). *Education at a Glance 2010*. Table D.5.4.

Note: Private schools here include either government-dependent or independent private schools.

v. How many teachers meet requirements to enter teaching?

Limited data exist on the share of teachers that comply with entry requirements. However, since in many education systems teachers are only required to be

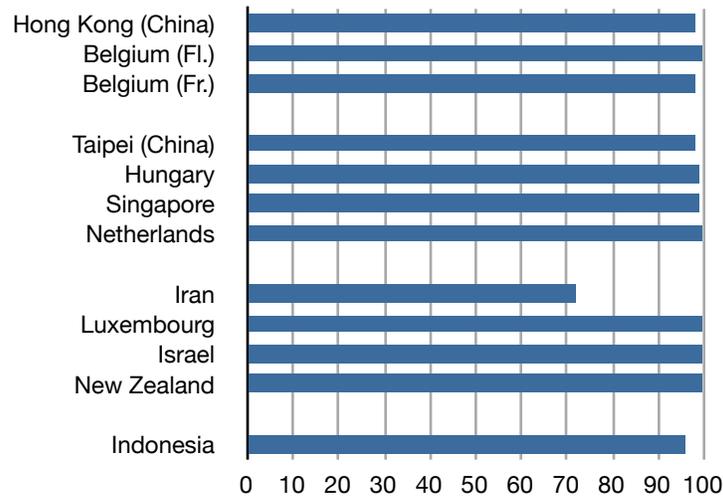
certified, one can use the percentage of certified (trained) teachers as a proxy for this indicator. We find that the share of trained teachers is close to universal in systems that are both top-performing and rapidly-improving and in those that are top-performing, but rather uneven among the short-term rapid-improvers: while Lebanon has less than a fourth of trained teachers, Ghana has about 50% in primary and close to 70% in secondary and Mexico has above 80% in both levels. This suggests that while trained teachers are a given in the best systems, teacher certification might not always be a necessary driving force of improvements in learning outcomes in the short-run.



Source: UNESCO (2010). *Global Education Digest 2010*.

However, at least when it comes to reading teachers, data suggest that—with the exception of Iran—virtually all students in successful education systems are taught by certified teachers. Even in Iran, which has achieved long-term achievement gains in a challenging environment, over 70% of reading teachers are certified.

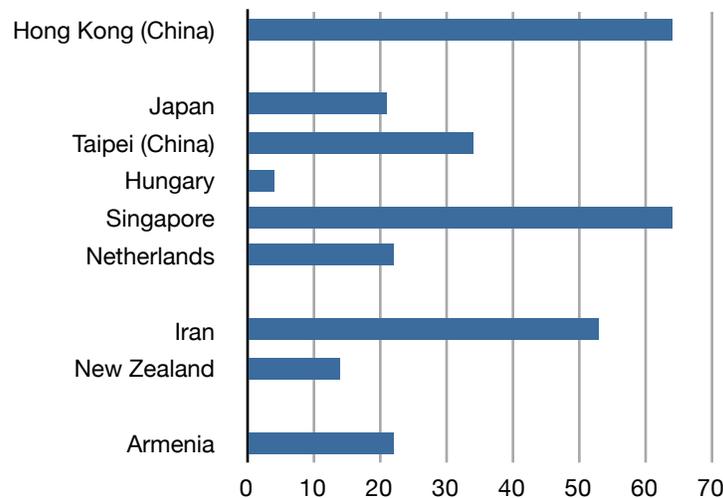
Percentage of students taught by certified reading teachers, 2006



Source: IEA (2006). *PIRLS 2006 International Report*. Exhibit 6.1.

There is considerable reason to believe that, even when most teachers are certified, teachers' preparedness varies considerably by education levels and possibly even by grade. For example, while few fourth graders have math teachers with a math major (except in Hong Kong-China, Singapore and Iran), many more eighth graders have teachers with such qualifications. While it is possible that a teacher might not need a math major to teach fourth grade mathematics, certification (or training) may not be as straightforward a measure of teacher preparedness as one might initially believe education system.

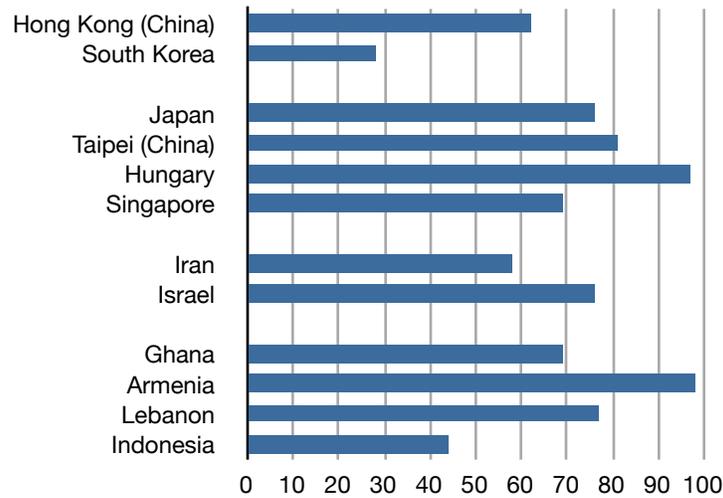
Percentage of students whose math teacher has a math major, 4th grade, 2007



Source: IEA (2006). *TIMSS 2007 International Mathematics Report*. Exhibit 6.3.

Note: These figures include both primary school teachers with a major in math and math teachers without a major in primary education.

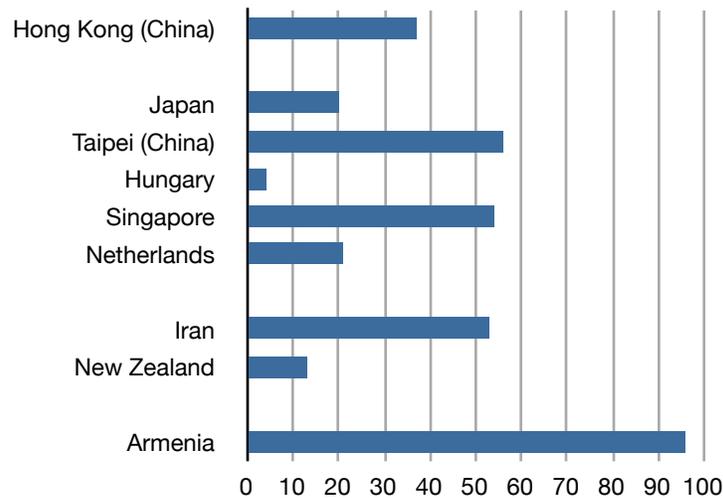
Percentage of students whose math teacher has a math major, 8th grade, 2007



Source: IEA (2006). *TIMSS 2007 International Mathematics Report. Exhibit 6.3.*

The same pattern emerges among science teachers. With the exception of Armenia, which has nearly all of its science fourth graders being taught by science majors, most successful education systems have science teachers with other qualifications in this grade. Yet, in eighth grade, most science students in these systems are taught by instructors with science majors (with the exception of Iran).

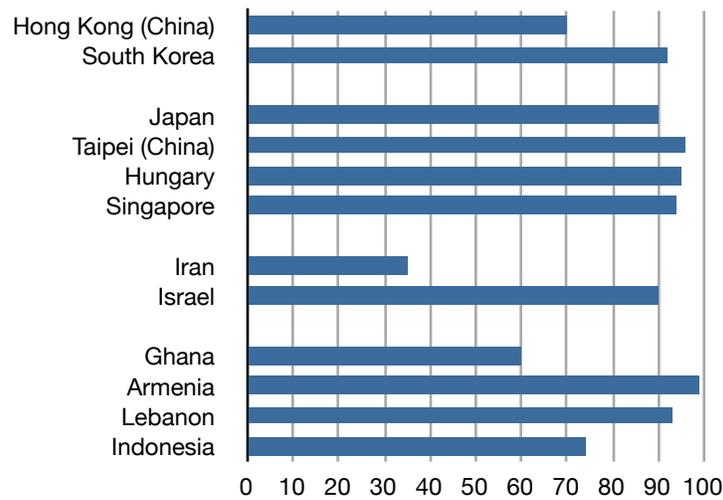
Percentage of students whose science teacher has a science major, 4th grade, 2007



Source: IEA (2006). *TIMSS 2007 International Science Report. Exhibit 6.3.*

Note: These figures include both primary school teachers with a major in science and science teachers without a major in primary education.

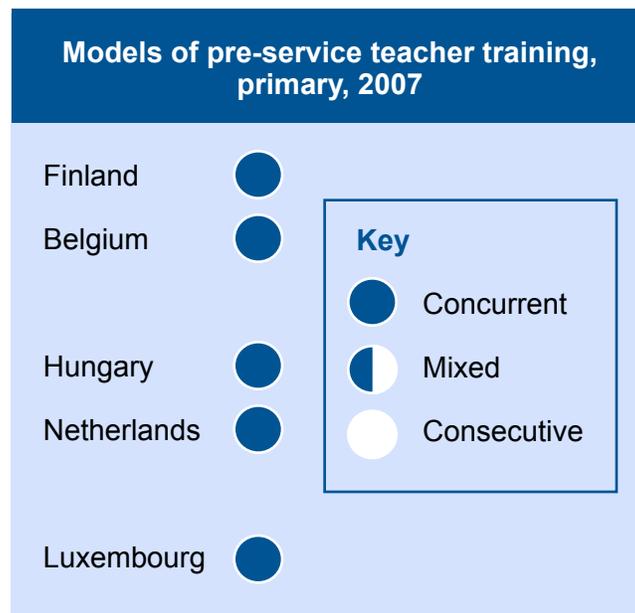
Percentage of students whose science teacher has a science major, 8th grade, 2007



Source: IEA (2006). TIMSS 2007 International Science Report. Exhibit 6.3.

vi. How many models of pre-service teacher training programs are there for primary school teachers?

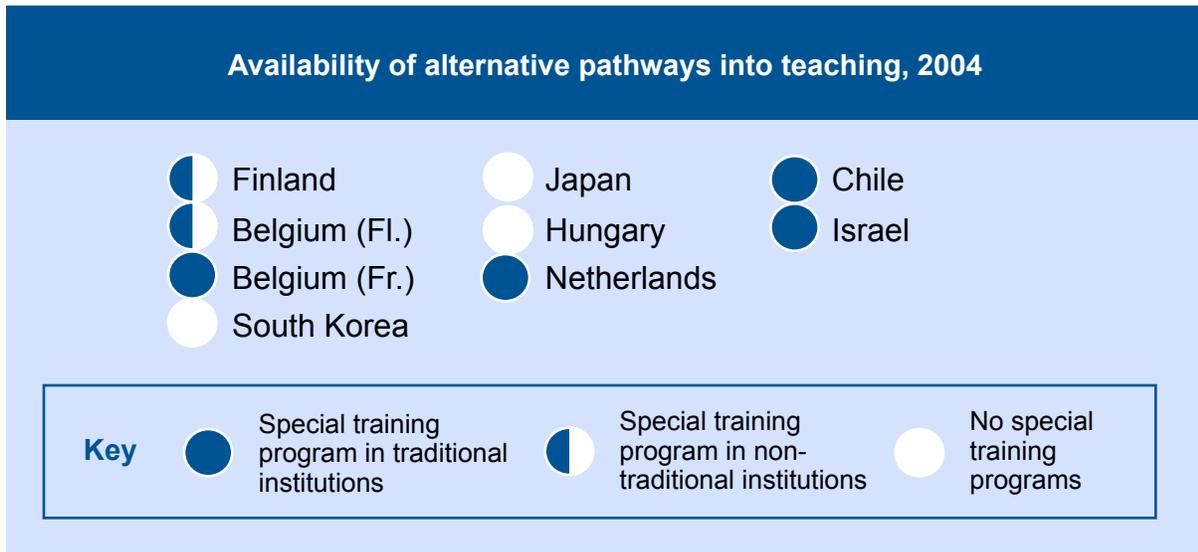
Not many successful education systems report on their existing models of pre-service teacher training, but those that do have a concurrent model for primary school teachers.



Source: Eurydice (2009). Key Data on Education in Europe 2009. Figure D.17.

In addition to a concurrent teacher education model, most successful education systems with data also have alternative pathways into teaching. Some, such as

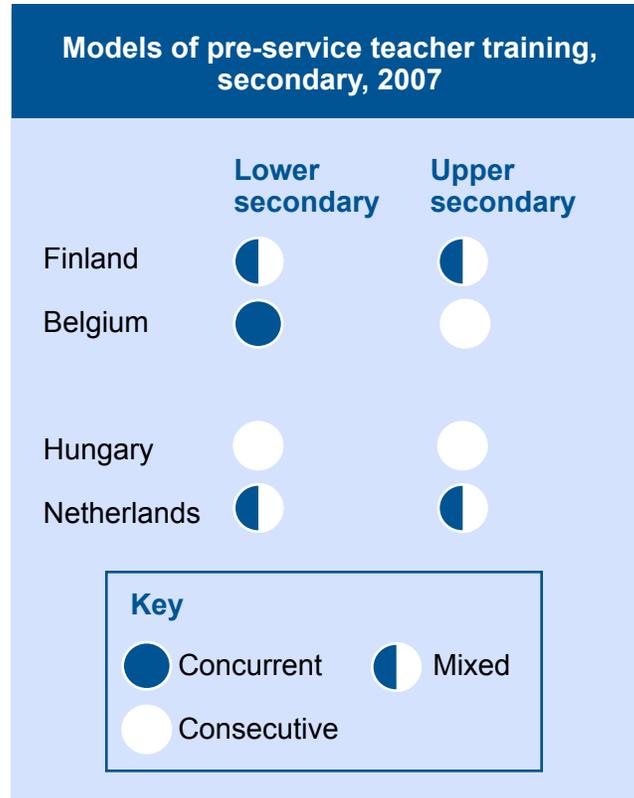
Finland and Belgium (Fl.), have special training programs in non-traditional institutions (i.e., in places other than education schools); others, such as Belgium (Fr.), the Netherlands, Chile and Israel have special training programs within education schools. South Korea, Japan and Hungary report no alternative pathways into teaching. (These data apply to both primary and secondary).



Source: OECD (2005). *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*. Table 3.4.

vii. How many models of pre-service teacher training programs are there for secondary school teachers?

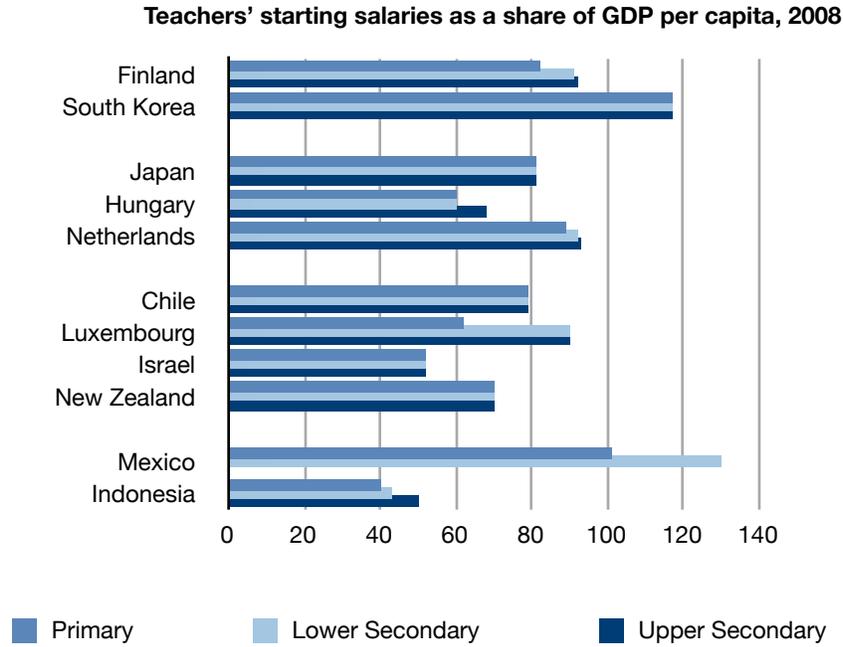
Models of pre-service teacher training are much more varied for secondary school teachers. There is a trend towards having both concurrent and consecutive models, but while countries like Finland and Netherlands have both models at the lower- and upper-secondary levels, Belgium has a concurrent model for lower-secondary school teachers and a consecutive model for upper-secondary school teachers. Hungary is the only one that only offers a consecutive model for both stages of secondary education.



Source: Eurydice (2009). *Key Data on Education in Europe 2009*. Figure D.17.

- b. Are pay and benefits appealing for talented candidates?
 i. Is starting teacher pay competitive?

Teachers' starting salaries in most successful education systems are roughly between 80 and 120% of GDP per capita, yet there are differences across groups of education systems. Those systems that are both top-performing and rapidly-improving stay within this range, both some top-performing countries such as Hungary offer salaries that are as low as 60% of GDP per capita. The group of long-term rapidly-improving education systems span a wide range, from 50 to 90% of GDP per capita and the short-term rapidly-improving education systems display no clear trend: while Mexico pays its starting teachers between 100 and 140% of GDP per capita, Indonesia pays them between 40 and 50% of GDP per capita.



Source: UNESCO (2010). *Global Education Digest 2010*, Table 24.

If we consider the *average* pay of secondary school teachers, the trend among successful education systems is clearer: with the exceptions of Hong Kong-China, Hungary and Israel, all other systems pay their secondary school teachers between 100 and 200% of GDP per capita, and most pay roughly between 100 and 150%.



Source: OECD (2010). *PISA 2009 Results: What Makes a School Successful?* Table IV.A5.5.

ii. *How often is teacher pay disbursed on time?*

No data were available on this indicator.

iii. Does pay change over a teacher's career?

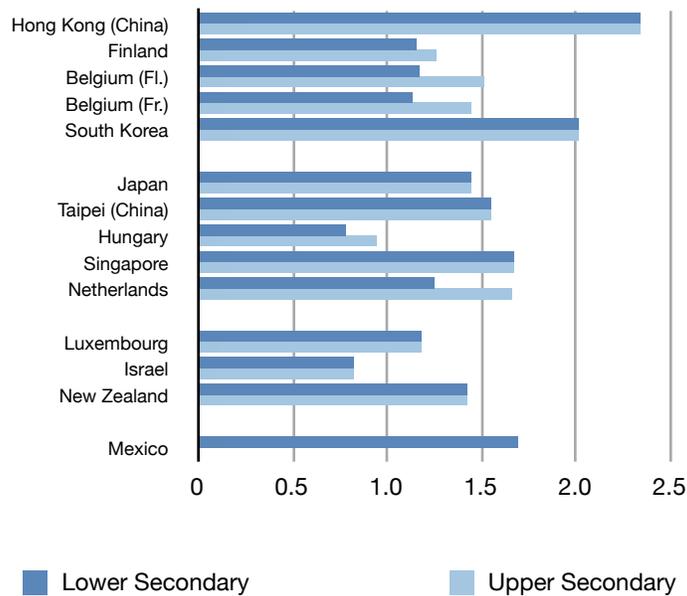
Except for Hungary, Luxembourg and Israel, all successful education systems pay their teachers more when they acquire more experience than when they are just starting. In primary schools, most systems pay teachers with 15 years of experience between 1.1 and 1.6 more than beginning teachers, although some such as Hong Kong-China and South Korea pay teachers close to twice as much after they have acquired 15 years of experience.



Source: OECD (2010). *PISA 2009 Results: What Makes a School Successful?* Table IV.3.21a.

In secondary, most successful education systems also pay their teachers between 10 and 60% after they acquire 15 years of experience (with the exception of Hungary and Israel). Hong Kong-China and South Korea continue to be the exception: they pay teachers between 100% and 150% more after the same time has elapsed.

Ratio of teachers' salaries (15 years to starting salary), secondary, 2008



Source: OECD (2010). *PISA 2009 Results: What Makes a School Successful?* Table IV.3.21a.

iv. Is teacher pay (salary or bonus) differentiated by subject, geographic area, grade or student population?

Not all successful education systems offer salary differentials or bonuses to incentivize individuals to teach particular subjects. One group (Finland, South Korea, the Netherlands, New Zealand and Mexico) offer some salary adjustment, whether in the base salary, annual or incidental payments. Another group (Belgium, Japan, Hungary, Luxembourg and Israel) do not offer any type of incentives at all.

Education Systems with payment for teaching a particular subject, by type of salary adjustment			
	Base salary	Annual payments	Incidental payments
Finland	✓	✓	✓
Belgium	✗	✗	✗
South Korea	✗	✓	✗
Japan	✗	✗	✗
Hungary	✗	✗	✗
Netherlands	✓	✓	✓
Luxembourg	✗	✗	✗
Israel	✗	✗	✗
New Zealand	✗	✓	✗
Mexico	✓	✓	✗

Source: OECD (2010). *Education at a Glance 2010*.

With the exception of Belgium and Luxembourg, all successful education systems offer salary adjustments for teachers to work in disadvantaged areas. Most often, these adjustments are in the base salary or in annual payments.

Education Systems with payment for teaching in a disadvantaged areas, by type of salary adjustment			
	Base salary	Annual payments	Incidental payments
Finland	✓	✓	✗
Belgium	✗	✗	✗
South Korea	✗	✗	✓
Japan	✗	✓	✗
Hungary	✗	✓	✗
Netherlands	✓	✓	✓
Luxembourg	✗	✗	✗
Israel	✓	✗	✗
New Zealand	✗	✓	✗
Mexico	✓	✓	✗

Source: OECD (2010). *Education at a Glance 2010*.

With the exception of Belgium and Mexico, all successful education systems with data offer salary adjustments for teachers to teach students with special needs. In nearly all cases, these adjustments are in the base salary or in annual payments.

Education Systems with payment for teaching students with special needs, by type of salary adjustment			
	Base salary	Annual payments	Incidental payments
Finland	✓	✗	✗
Belgium	✗	✗	✗
South Korea	✗	✓	✗
Japan	✗	✓	✗
Hungary	✗	✓	✗
Netherlands	✓	✓	✓
Luxembourg	✓	✗	✗
Israel	✓	✗	✗
New Zealand	✗	✓	✗
Mexico	✗	✗	✗

Source: OECD (2010). *Education at a Glance 2010*.

v. Does pay vary according to teacher performance?

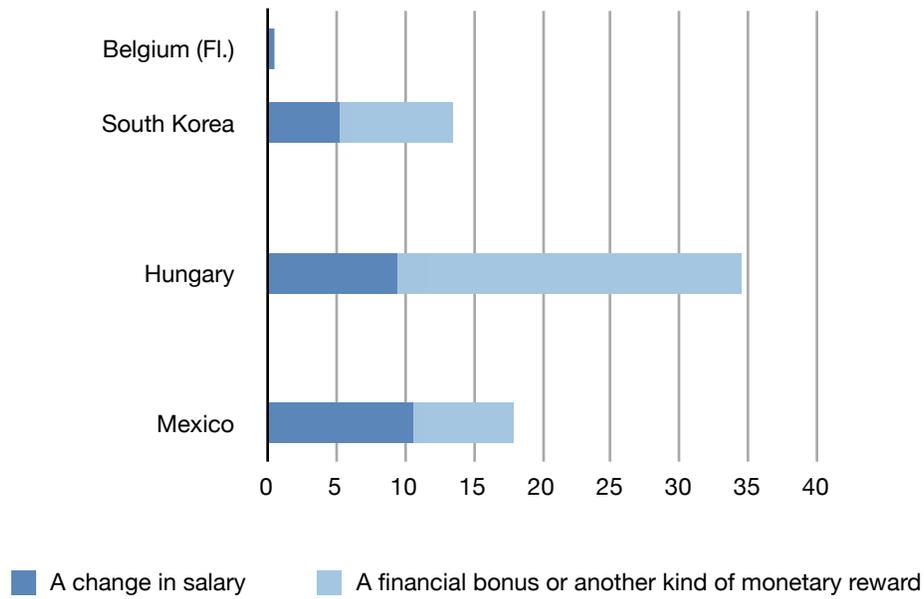
Not all successful education systems have merit pay programs for teachers. While Finland, Hungary, the Netherlands, New Zealand and Mexico have these programs, but Belgium, South Korea, Japan, Luxembourg and Israel do not. Among those who do pay teachers more for their performance, there is no clear trend regarding whether they adjust base salaries, annual or incidental payments.

Education Systems with payment for outstanding performance, by type of salary adjustment			
	Base salary	Annual payments	Incidental payments
Finland	X	✓	X
Belgium	X	X	X
South Korea	X	X	X
Japan	X	X	X
Hungary	X	X	✓
Netherlands	✓	✓	✓
Luxembourg	X	X	X
Israel	X	X	X
New Zealand	X	✓	X
Mexico	✓	✓	X

Source: OECD (2010). *Education at a Glance 2010*.

Interestingly, however, data suggest that even in education systems that report to have merit pay programs in place, these programs may be impacting only a small share of their teachers. For example, while both Hungary and Mexico report to reward outperforming teachers, only 35% of Hungarian teachers and less than 20% of teachers report to work in schools where they have a possibility of obtaining such a bonus. Thus, even where merit pay programs exist, only a minority of teachers report to be affected by them.

Percentage of teachers with salary changes resulting from evaluations, secondary, 2008



Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 5.4.

vi. Are all teachers entitled to retirement and health benefits?

School systems with experience requirements for retirement, 2002		
	Minimum experience required?	If so, how many years of experience?
Finland	X	N/A
Belgium (Fl.)	X	N/A
Belgium (Fr.)	X	N/A
South Korea	X	N/A
Hungary	X	N/A
Netherlands	X	N/A
Chile	X	N/A
Israel	✓	35 years

Source: OECD (2005). *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*. Table 6.3.

School systems with experience requirements for some benefits, 2002		
	Minimum experience required?	If so, how many years of experience?
Finland	X	N/A
Belgium (Fl.)	X	N/A
Belgium (Fr.)	X	N/A
South Korea	✓	20 years
Hungary	X	N/A
Netherlands	X	N/A
Chile	X	N/A
Israel	✓	10 years

Source: OECD (2005). *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*. Table 6.3.

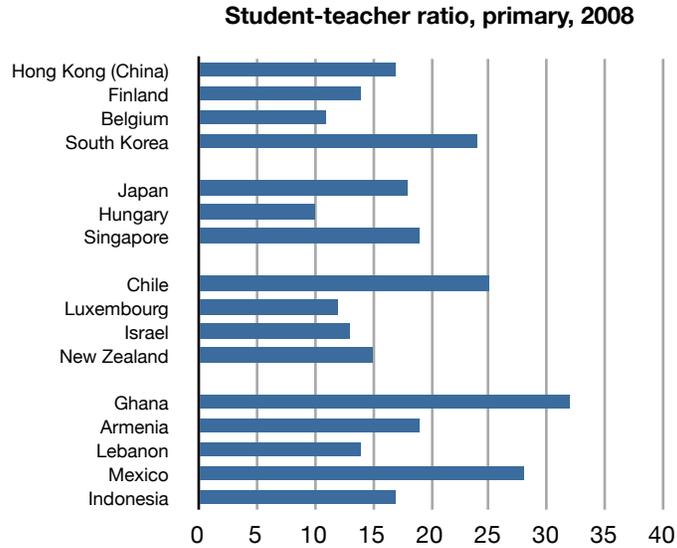
c. Are working conditions appealing for talented candidates?

i. *How many schools comply with standards for the infrastructure, hygiene and sanitation of schools?*

No data were available on this indicator.

ii. *How many students are there per each teacher, (primary)?*

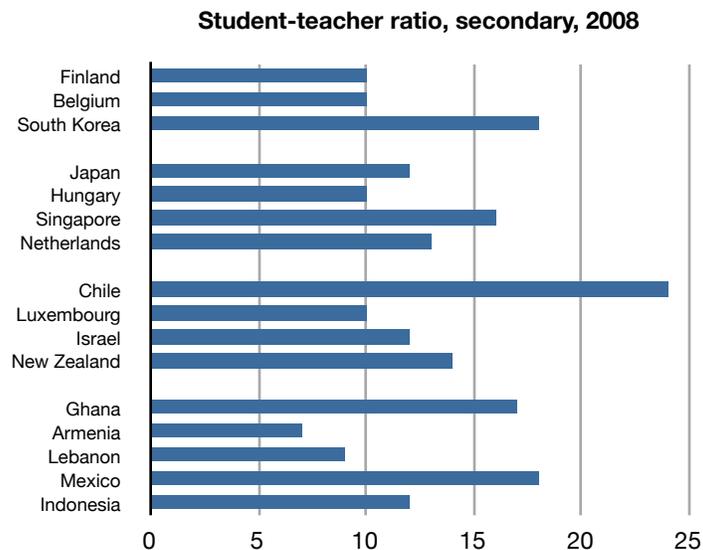
In primary, most successful education systems have between 10 and 20 students per teacher. There are four exceptions to this rule: South Korea, Chile, Ghana and Mexico.



Source: UNESCO (2010). *Global Education Digest 2010*.

iii. How many students are there per teacher, (secondary)?

Similarly, in secondary, most successful education systems have between 5 and 15 students per teacher, with the exception of South Korea, Singapore, Chile, Ghana and Mexico.



Source: UNESCO (2010). *Global Education Digest 2010*.

d. Are there attractive career opportunities?

i. Are there opportunities for horizontal promotions for teachers?

ii. Are promotion opportunities linked to performance?

3. Preparing Teachers with Useful Training and Experience

- a. Are there minimum standards for pre-service teaching training programs?
 i. *Is there an accreditation process for pre-service teacher training programs?*

No data were available on this indicator. SABER-Teachers will collect these data.

- ii. *Are there specifications for how much these programs should devote to the teaching of different subjects for primary school teachers?*

No data were available on this indicator.

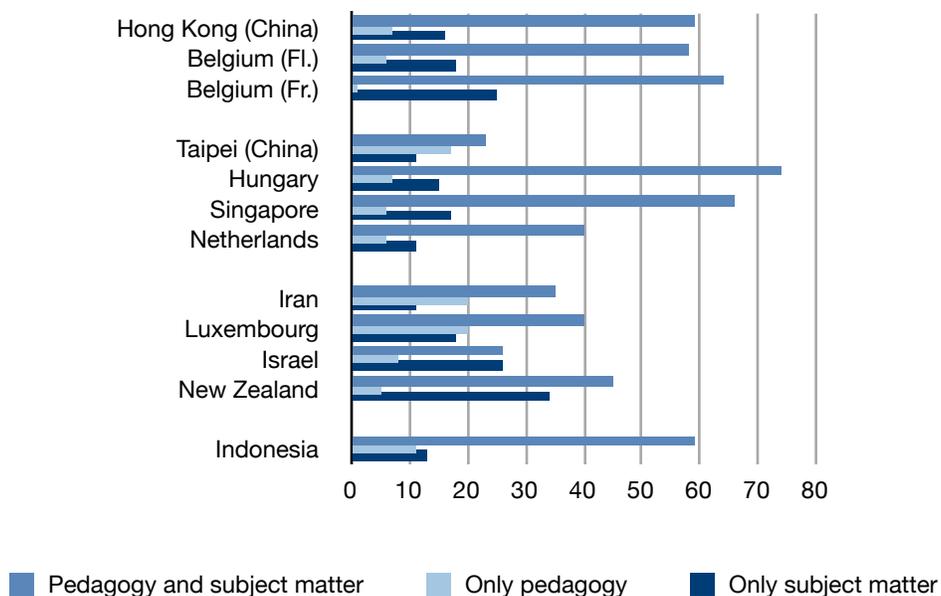
- iii. *Are there specifications for how much these programs should devote to the teaching of different subjects for secondary school teachers?*

No data were available on this indicator.

- iv. *In the specifications for primary school teachers, how much time is devoted to pedagogical theory and methods and how much to subject matter knowledge?*

In most successful education systems, pre-service teacher training emphasizes a balance of pedagogy and subject matter. And with the exception of Taipei-China, Iran and Luxembourg, all other successful education systems with data are likely to emphasize subject matter knowledge over pedagogy.

Percentage of students by emphasis in teachers' studies, 2006



Source: IEA (2006). PIRLS 2006 International Report. Exhibit 6.2.

- b. Are trainee teachers required to have classroom experience to be allowed to teach?
 i. *Is teaching experience required for primary school teachers to enter the profession or is it part of teacher training programs?*

Few successful education systems with data require teaching experience as part of their pre-service teacher training program. This might be because they require it to enter the profession, but we found no data to confirm this possibility.

Education Systems with final 'on-the-job' qualifying phase, primary and secondary, 2007		
	Final 'on-the-job' phase?	If so, how long is this phase?
Finland	X	N/A
Belgium	X	N/A
Hungary	X	N/A
Netherlands	X	N/A
Luxembourg	✓	21 months

Source: Eurydice (2009). *Key Data on Education in Europe 2009*. Figure D.22.

- ii. *Is teaching experience required for secondary school teachers to enter the profession or is it part of teacher training programs? (See 3.b.i)*

No data were available on this indicator.

- iii. *How much experience are primary school teachers required to have?*

No data were available on this indicator.

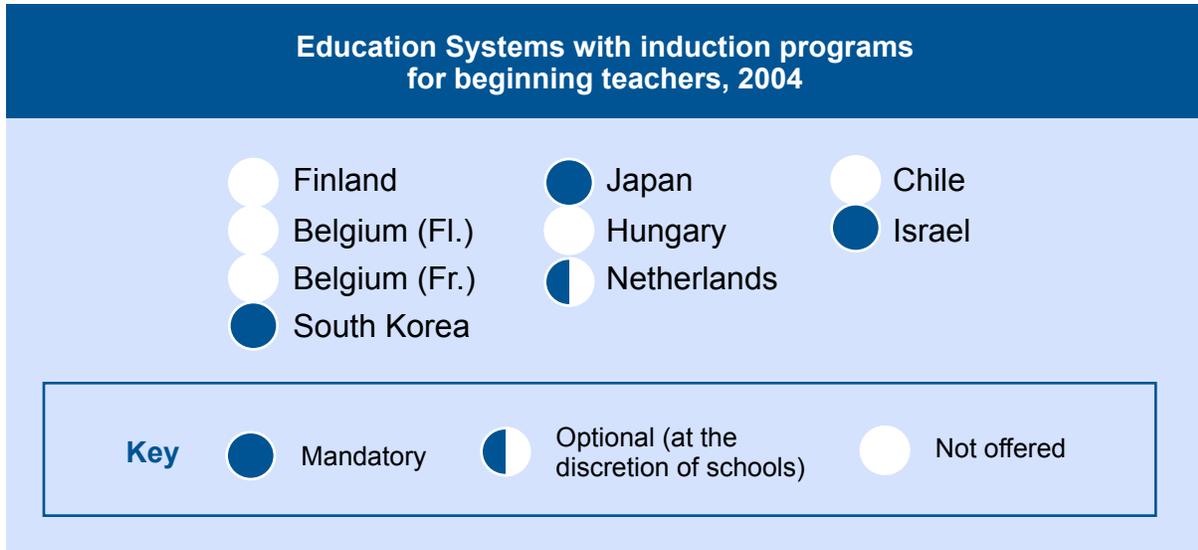
- iv. *How much experience are secondary school teachers required to have?*

No data were available on this indicator.

- c. Do teachers have a smooth transition from pre-service training into their first job?

i. Are new primary school teachers required to participate in an induction and/or mentoring programs?

There is no clear trend among successful education systems on whether they offer induction programs for new primary school teachers. South Korea, Japan, the Netherlands and Israel do, but in the Netherlands it is at each school’s discretion. Finland, Belgium (Fl.), Belgium (Fr.), Hungary and Chile do not—at least when primary and secondary are combined.

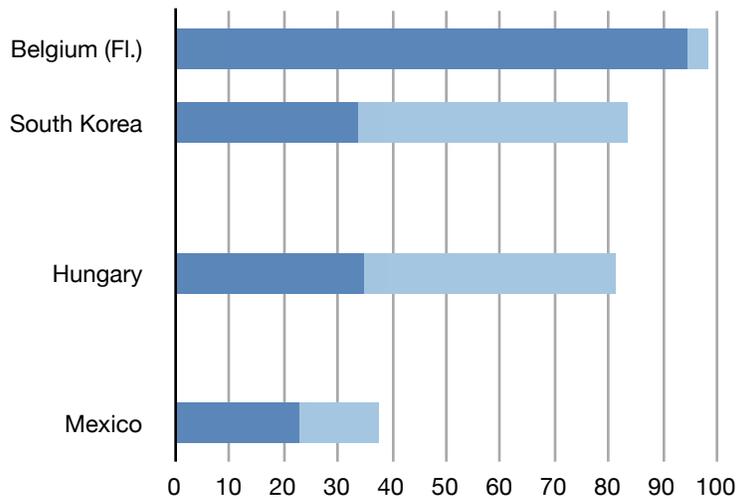


Source: OECD (2005). *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*. Table 4.2.

ii. Are new secondary school teachers required to participate in an induction and/or mentoring programs?

At the secondary level, most teachers in successful education systems with data have an induction program—either on their first job or every time they begin working at a new school. The only exception to this trend is Mexico.

Percentage of teachers in schools with induction programs, secondary, 2008



■ Yes, for all teachers new to the school ■ Yes, but only for those in their first teaching job

Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 3.6.

iii. What is the required length of induction and/or mentoring programs for primary school teachers?

Those systems with induction programs typically run these programs for a year. South Korea is the only exception to this trend, with a 7-month induction program.

Length of induction programs for beginning teachers, 2004	
South Korea	7 months
Japan	1 year
Netherlands	1 year
Israel	1 year

Source: OECD (2005). *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*. Table 4.2

iv. What is the required length of induction and/or mentoring programs for secondary school teachers? **(See 3.c.iii)**

4. Matching Teachers' Skills with Students' Needs

a. Are there incentives for teachers to work at hard-to-staff schools?

i. Are teachers entitled to monetary incentives and/or a higher compensation package for working in hard-to-staff schools? (See 2.b.iii)

No data were available on this indicator.

ii. Is teaching experience used in deciding transfer priorities?

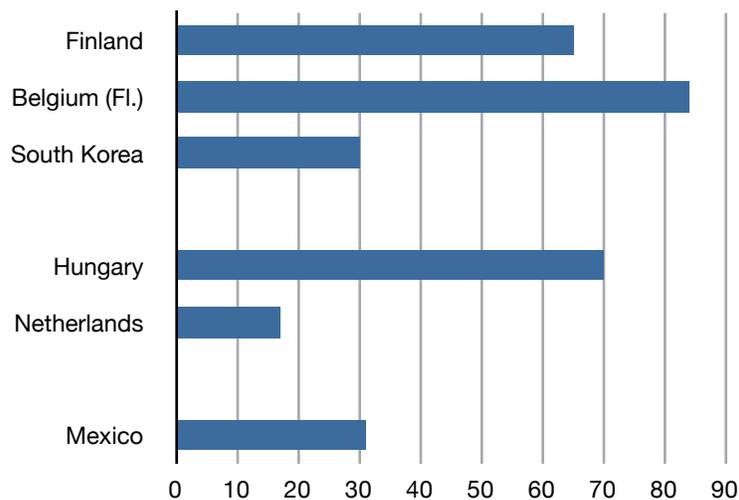
No data were available on this indicator.

b. Are there incentives for teachers to teach critical shortage subjects?

i. Are there critical shortage subjects?

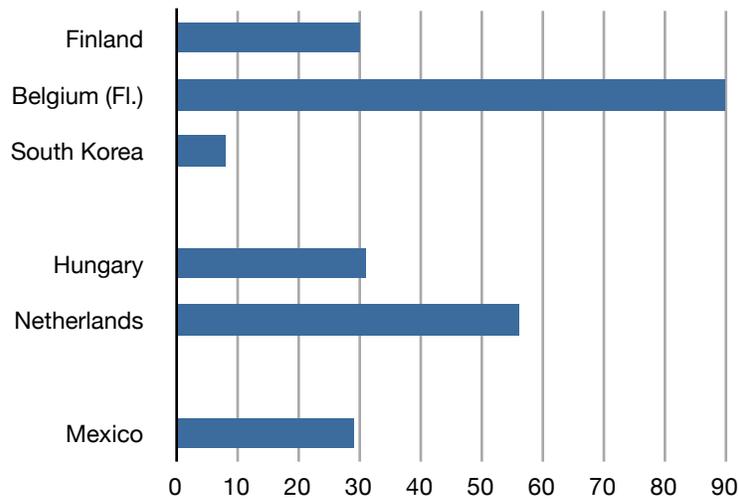
Data on schools' difficulty to find qualified teachers are relatively old, but they suggest that 30% or more of schools in successful education systems struggle to find qualified teachers in information technology (with the exception of the Netherlands) and 25% or more of schools in the same group of systems struggle to find qualified math teachers. This suggests that even in the best systems there ought to be identified critical shortage subjects.

Percentage of students whose principal has difficulty finding qualified IT teachers, secondary, 2001



Source: OECD (2005). *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*. Figure 3.1.B.

Percentage of students whose principal has difficulty finding qualified math teachers, secondary, 2001



Source: OECD (2005). *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*. Figure 3.1.B.

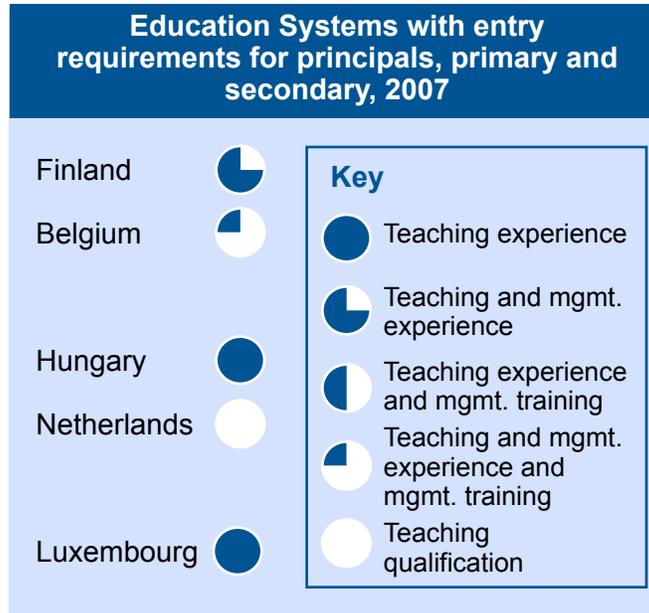
ii. Are teachers entitled to monetary incentives and/or a higher compensation package for teaching critical shortage subjects? (See 2.b.iii)

5. Leading Teachers with Strong Principals

a. Are requirements to become a principal set up to attract talented candidates?

i. Are there requirements to become a principal?

Entry requirements for school leaders vary widely among successful education systems with data, but with the exception of Hungary and Luxembourg, most systems rely on more than one requirement (i.e., they combine teaching experience with management experience and management training).



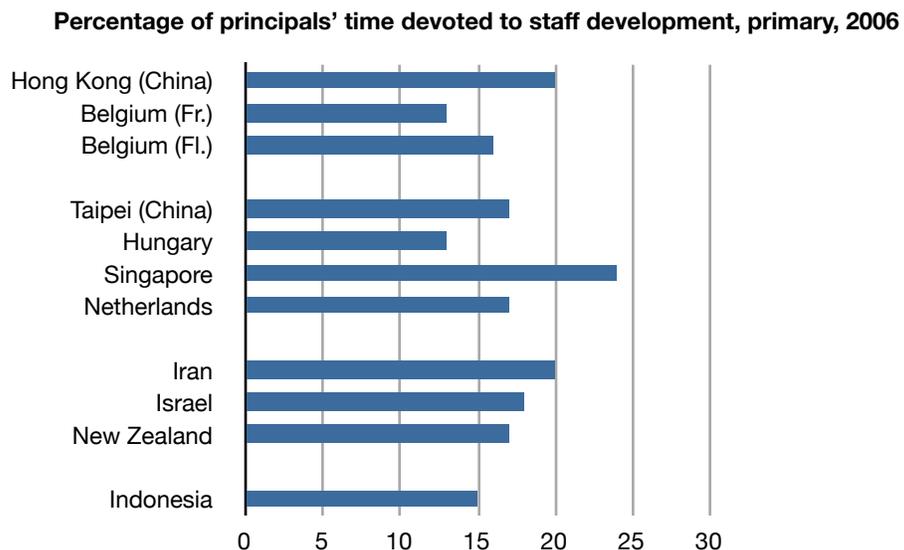
Source: Eurydice (2009). Key Data on Education in Europe 2009. Figure D.38.

ii. What processes are in place to select principals? **(See 5.a.i)**

b. Do principals have incentives to perform?

i. Are principals explicitly required to provide guidance to teachers?

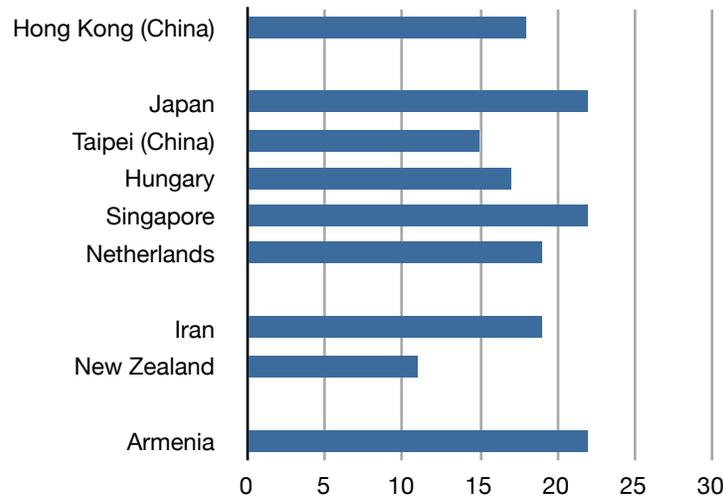
Limited data exist on whether principals are specifically asked to serve as instructional leaders, but principals in most successful education systems report that they devote 10 to 20% of their time to staff development in primary. The only exception is Singapore, where principals report they spend nearly 25% of their time to this activity.



Source: IEA (2006). *PIRLS 2006 International Report. Exhibit 7.4.*

Since this is an imperfect measure of principals' time spent supporting instruction, we can also use data on the time that primary school principals spend supervising and evaluating teachers. Most principals in successful education systems report that they spend 15 to 25% of their time doing this. The only exception is New Zealand, where the average principal spends only slightly more than 10% of their time doing this.

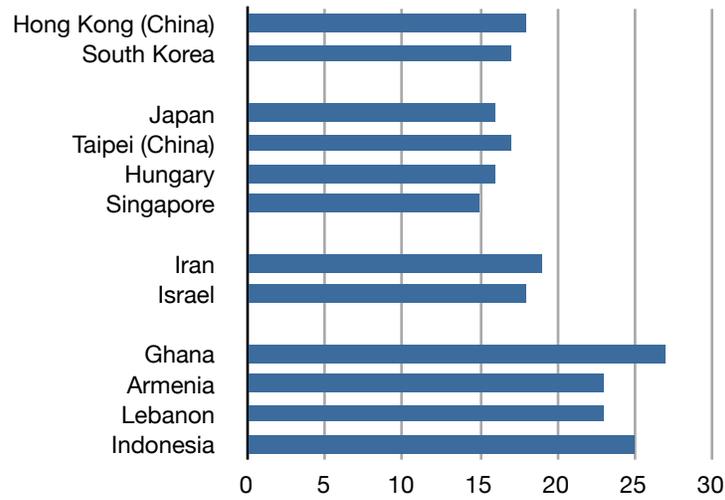
Percentage of principals' time devoted to supervising and evaluating teachers, 4th grade, 2007



Source: IEA (2006). *TIMSS 2007 International Mathematics Report. Exhibit 8.5.*

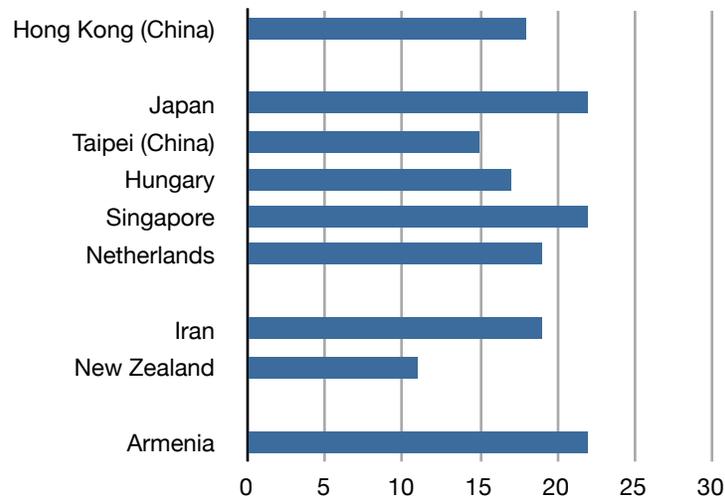
Interestingly, this pattern changes somewhat for secondary school principals. In systems that are both top-performing and rapidly-improving, as well as in systems that are only top-performing, principals spend 15 to 20% of their time supervising and evaluating teachers. In systems that are rapidly-improving, both in the short- and long-run, principals spend 15 to 25% of their time doing so, with the exception of Ghana, where principals spend more than 25% of their time doing this. However, these patterns differ somewhat depending on whether we are focusing on the principals of math or science students.

Percentage of principals' time devoted to supervising and evaluating teachers, 8th grade, 2007



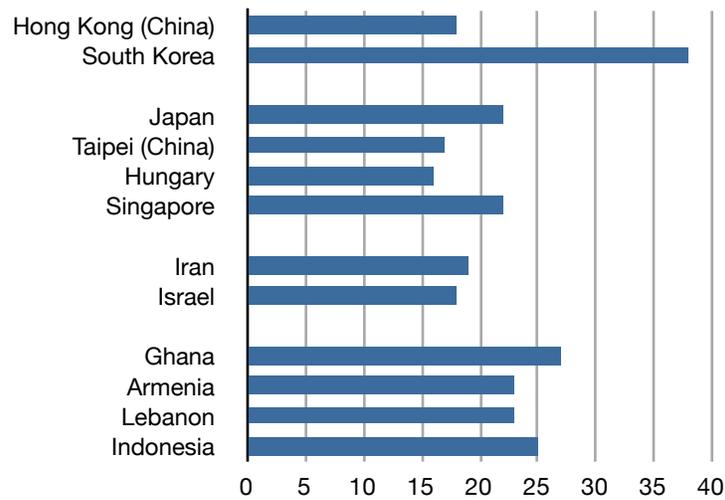
Source: IEA (2006). *TIMSS 2007 International Mathematics Report. Exhibit 8.5.*

Percentage of principals' time devoted to supervising and evaluating teachers, 4th grade, 2007



Source: IEA (2006). *TIMSS 2007 International Science Report. Exhibit 8.5.*

Percentage of principals' time devoted to supervising and evaluating teachers, 8th grade, 2007

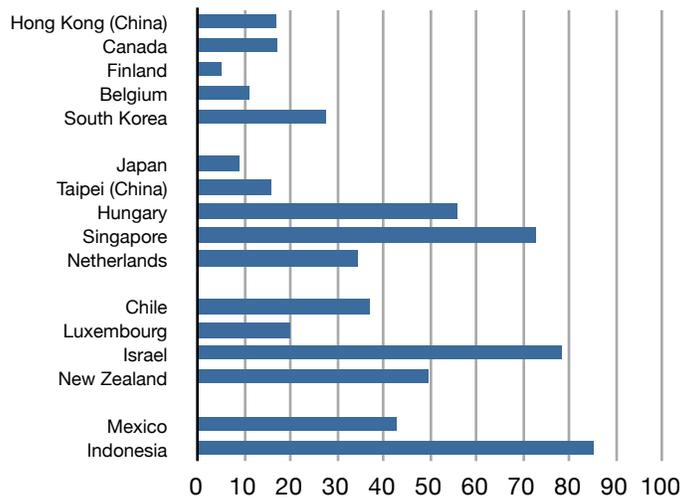


Source: IEA (2006). TIMSS 2007 International Science Report. Exhibit 8.5.

ii. Are principals evaluated regularly?

Limited data are available on whether principals are regularly evaluated, but data do exist on the extent to which student achievement data are used to evaluate principals. With the exception of Hungary, Singapore, Israel and Indonesia, in most successful systems, this is the case only for a minority of principals.

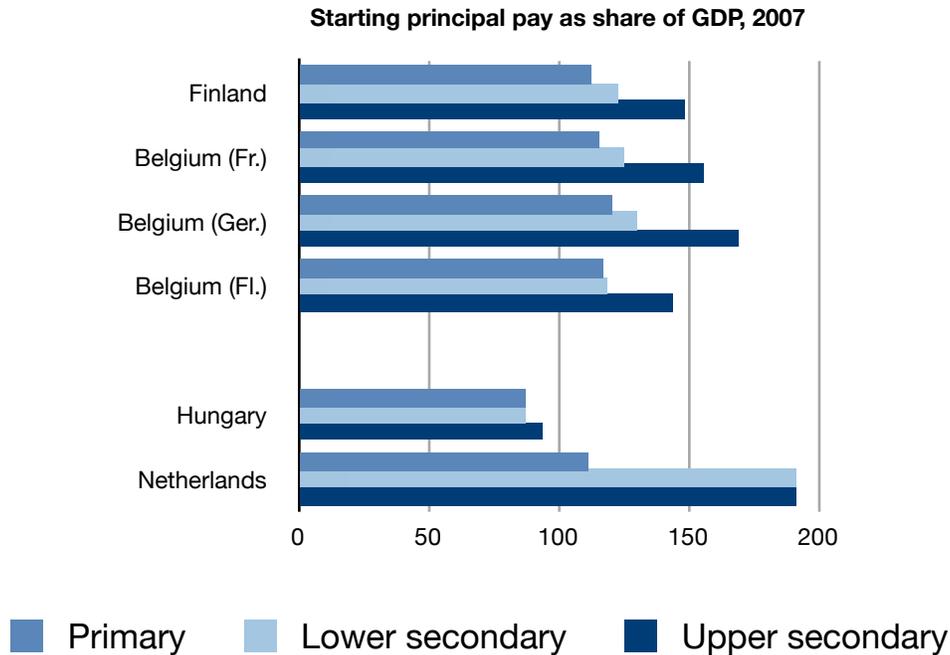
Percentage of students in schools by use of test scores to evaluate principals, 2009



Source: OECD (2010). PISA 2009 Results: What Makes a School Successful? Table IV.3.13.

iii. Is average principal pay competitive?

With the exception of Hungary, starting principal pay is between 100 and 200% of GDP per capita. Yet, even Hungary is not that far from the trend: its starting principal pay is just below 100% of GDP per capita.



Source: Eurydice (2010). *Key Data on Education in Europe 2009*. Figure D.40.

Notes: (1) Figure shows minimum pay. (2) For countries that only reported figures for small and large schools, a simple average of the two were done to get a sense of the average pay at that level.

iv. Can principals receive monetary incentives for performance?

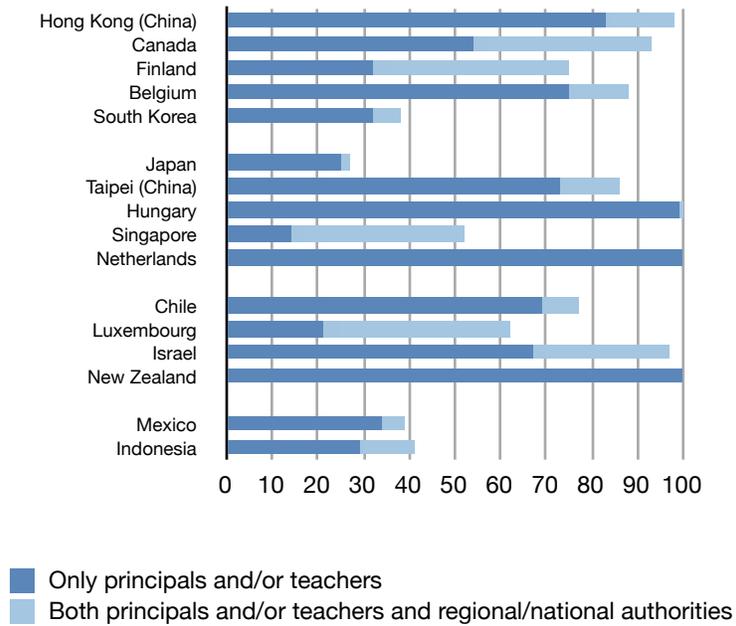
No data were available on this indicator.

c. Can principals make key decisions?

i. Do principals have a say or decide on teacher hiring?

With the exception of South Korea, Mexico and Indonesia, in most successful education systems, the principals of most secondary school students have a say or decide over teacher hiring—either by themselves or jointly with regional and national authorities.

Percentage of students in schools with principal discretion over teacher hiring, secondary, 2009

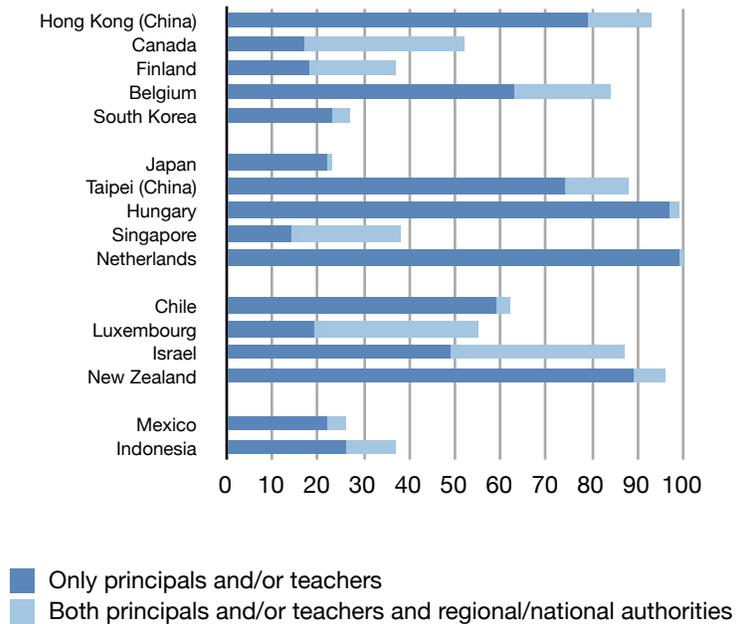


Source: OECD (2011). *Building a High-Quality Teaching Profession*. Figure 2.7.

ii. Do principals have a say or decide on teacher dismissals?

Secondary school principals have a say over teacher dismissals in some successful education systems (Hong Kong-China, Belgium, Taipei-China, Hungary, the Netherlands, Israel and New Zealand), but generally not in others (Canada, Finland, South Korea, Japan, Singapore, Mexico and Indonesia).

Percentage of students in schools with principal discretion over teacher dismissals, secondary, 2009

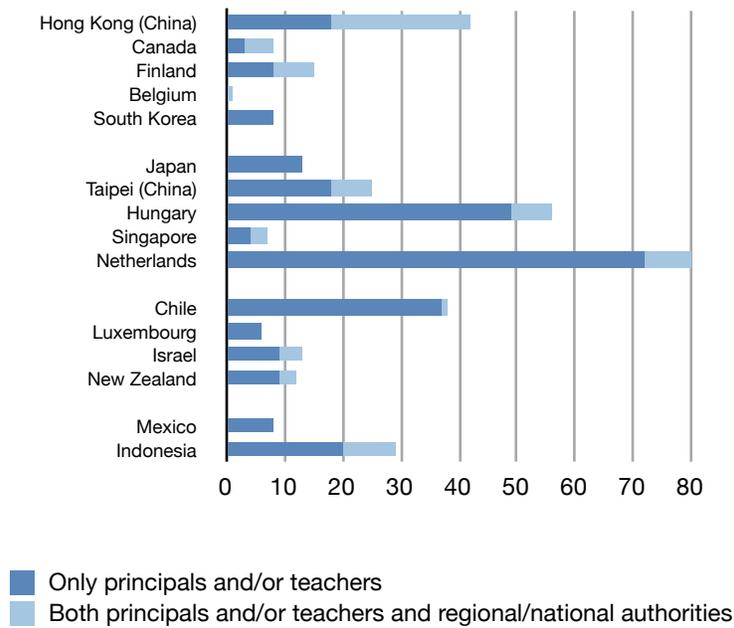


Source: OECD (2011). *Building a High-Quality Teaching Profession*. Figure 2.7.

iii. Do principals have a say or decide on teachers' pay?

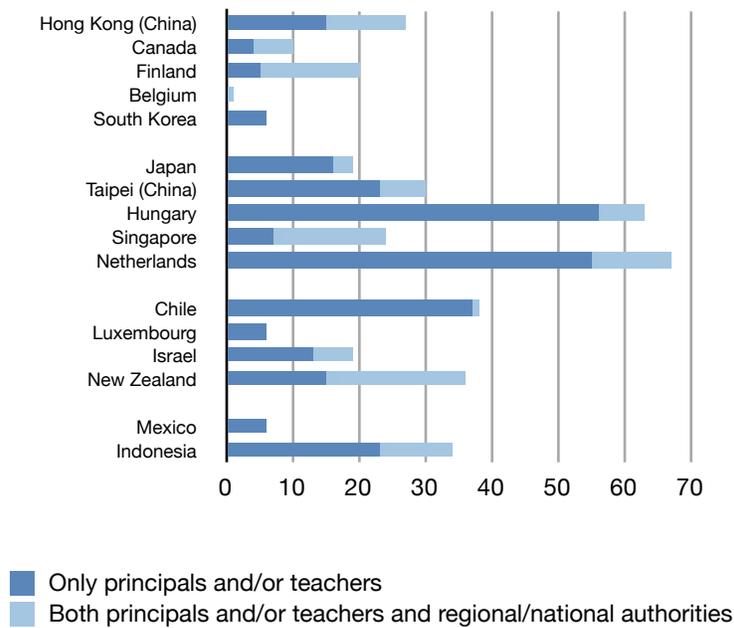
Even fewer principals in successful education systems have a say over teacher pay. This is true for most of the secondary school principals only in Hungary and the Netherlands, and for a fair share of those in Hong Kong-China, Chile and Indonesia, but only for a small minority of those in the rest of top systems. This applies to both monetary bonuses and salary increases.

Percentage of students in schools with principal discretion over teachers' starting salaries, secondary, 2009



Source: OECD (2011). *Building a High-Quality Teaching Profession*. Figure 2.7.

Percentage of students in schools with principal discretion over teachers' salary increases, secondary, 2009

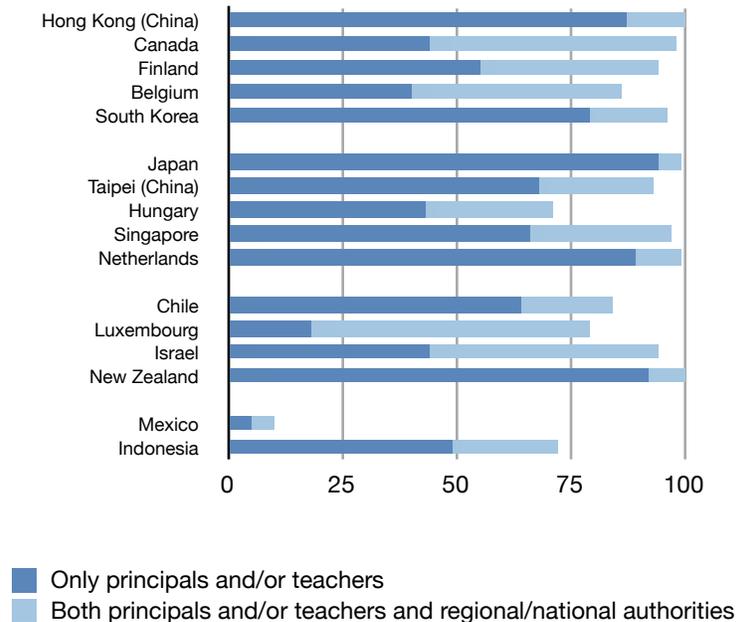


Source: OECD (2011). *Building a High-Quality Teaching Profession*. Figure 2.7.

iv. Do principals have a say or decide on the distribution of time during school hours?

There are no internationally comparable data on whether principals have a say over the distribution of school time, but this can be approximated with data on whether principals have a say over course offering. In all successful education systems, except for Mexico, most secondary school students go to schools where principals have discretion over course offering.

Percentage of students in schools with principal discretion over course offering, secondary, 2009



Source: OECD (2011). *Strong Performers and Successful Reformers in Education*. Figure 2.11.

v. *Do principals decide on teachers' promotions?*

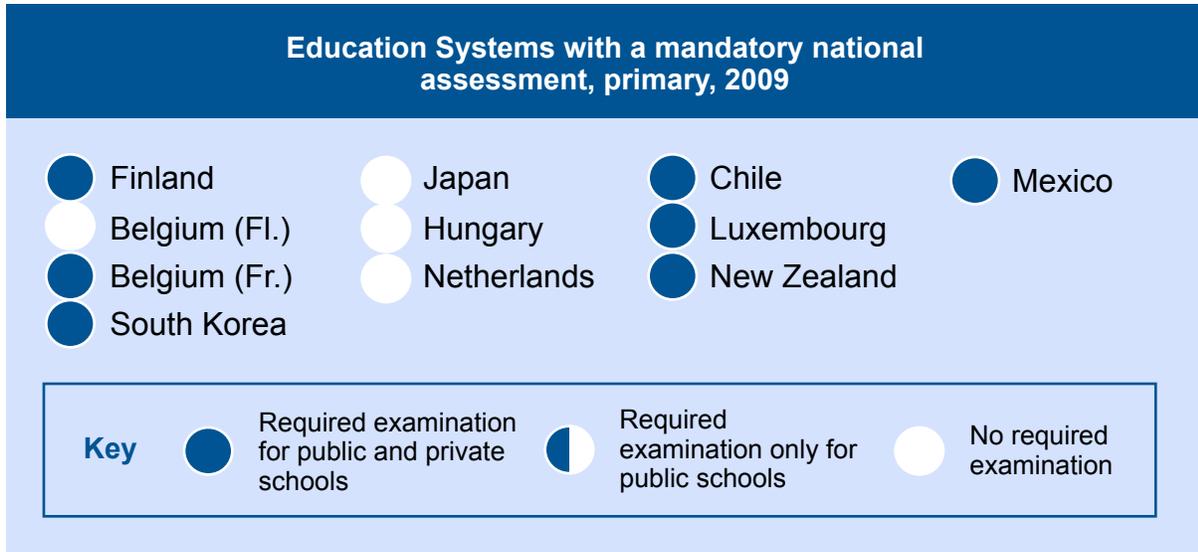
No data were available on this indicator.

6. Monitoring Teaching and Learning

a. Are there enough student achievement data to inform teaching?

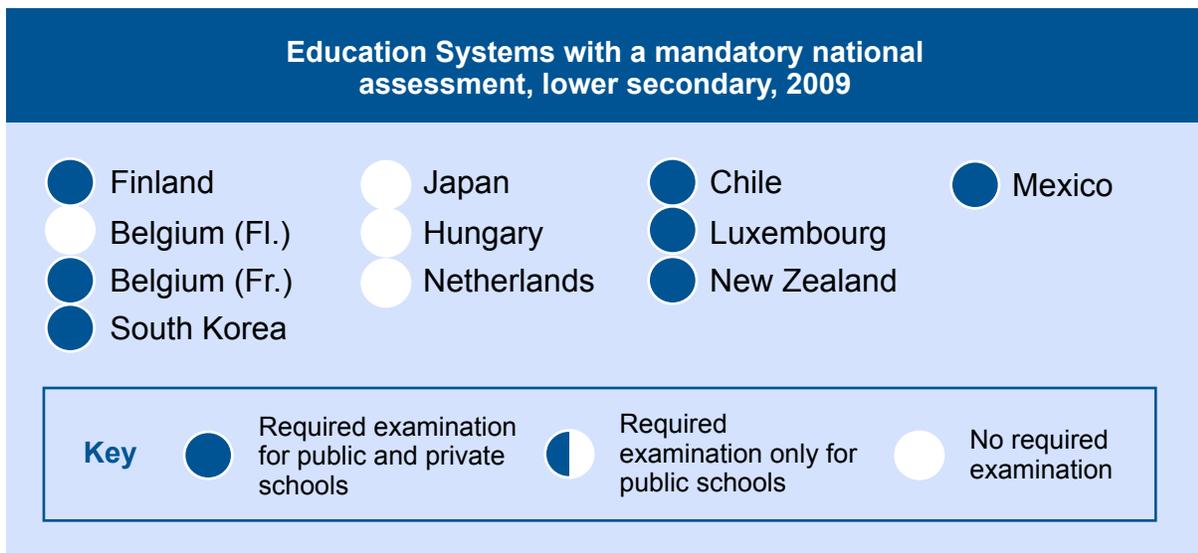
i. *Are there assessments of student learning at any level (international, national, sub-national)?*

With the exception of Belgium (Fl.), Japan, Hungary and the Netherlands, most successful education systems have a mandatory national assessment in both primary and lower secondary schools.



Source: OECD (2010). *Education at a Glance 2010*. Table D.5.4.

Note: Private schools here include either government-dependent or independent private schools.



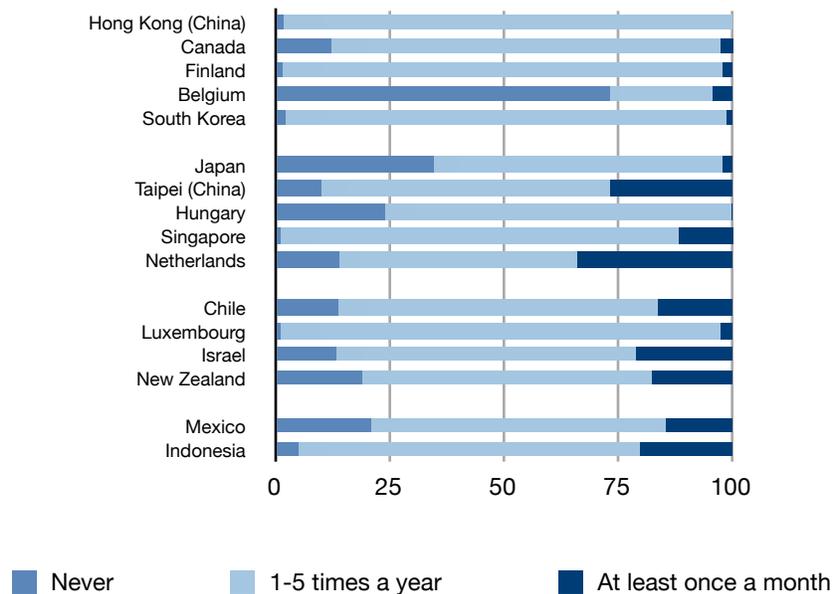
Source: OECD (2010). *Education at a Glance 2010*. Table D.5.4.

Note: Private schools here include either government-dependent or independent private schools.

ii. How frequent are assessments of student learning?

Except in Belgium, in all other successful education systems most secondary school students participate in standardized tests 1-5 times a year. In Belgium, the vast majority of secondary school students never participate in a standardized tests.

Percentage of students in schools by frequency of standardized tests, 2009



Source: OECD (2010). *PISA 2009 Results: What Makes a School Successful?* Table IV.3.10.

iii. How many grades do assessments of student learning include?

Except Lebanon, all other successful education systems evaluate student learning in at least two grades. In fact, they evaluate student learning at least once in primary and once in secondary and in most cases they evaluate two grades or more at each level.

Target population tested by national assessments, 2008

Canada	Ages 13, 15, 16	Chile	Grades 4, 8, 10
Finland	Grades 1-6, 12	Israel	Grades 1, 2, 5, 8, 9
	Ages 13, 15	New Zealand	Grades 4, 8
Belgium	Grades 3, 5, 7, 12	Ghana	Grades 2-4, 6
South Korea	Grades 6, 9, 10	Lebanon	Grade 4
Japan	Grades 5, 6, 9, 12	Mexico	Grades 2-6, 10-12
Hungary	Grades 1, 4-12	Indonesia	Grades 3, 12
Singapore	Pre-school-12		
Netherlands	Grades 2, 4, 6, 8		

Source: UNESCO (2008). *EFA Global Monitoring Report. Strong Foundations.* Table A.1-6.

Note: In some education systems, grades are covered by different assessments.

iv. Do national and/or sub-national assessments of student learning cover a sample or all students?

No data were available on this indicator.

v. In national and sub-national assessments, is it possible to track students over time?

No data were available on this indicator.

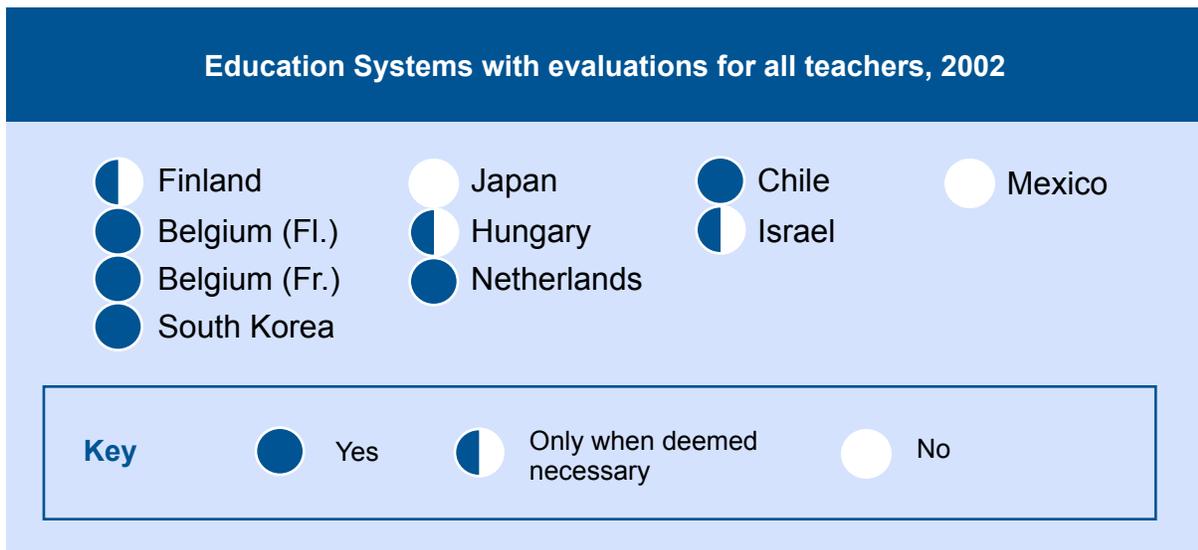
vi. In national and sub-national assessments, can students' scores in assessments be matched to individual teachers?

No data were available on this indicator.

b. Are there enough teacher performance data to inform teaching?

i. Are there teacher evaluations (internal or external)?

In most successful education systems with data, all teachers are evaluated. However, in some systems such as Finland, Hungary and Israel, they are only evaluated when deemed necessary (e.g., when there are reasons to believe they are not performing well) and yet in other systems, such as Japan and Mexico, there are no compulsory teacher evaluations.

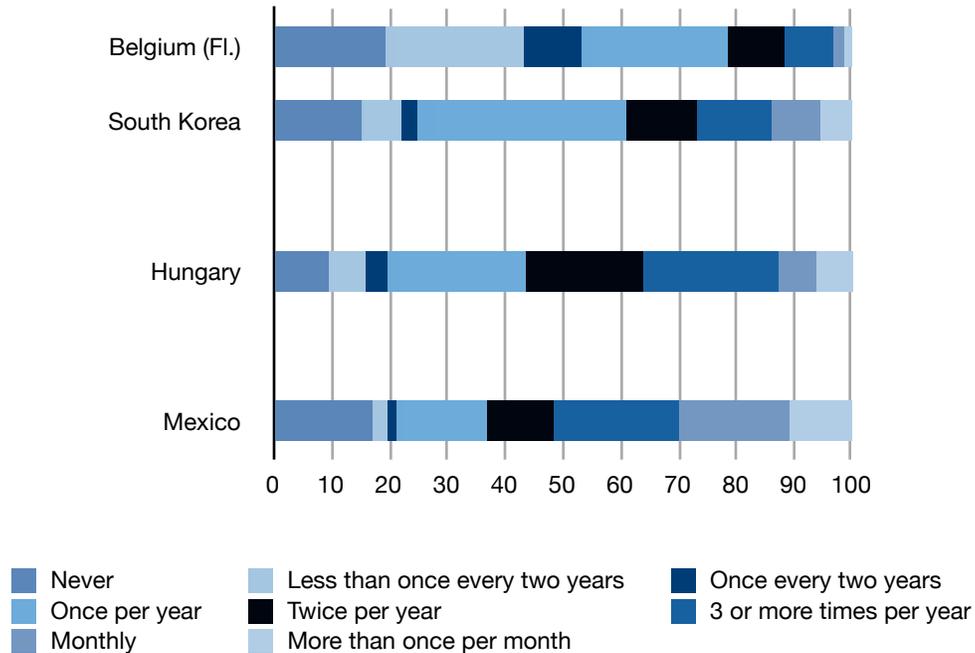


Source: OECD (2005). *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*. Table 6.5.

ii. How frequent are teacher evaluations?

Successful education systems with data differ considerably in the frequency of their teacher evaluations. However, only in a minority of education systems are teachers never evaluated internally (i.e., by their principals). In most systems with data, teachers are subject to 1-3 internal evaluations per year.

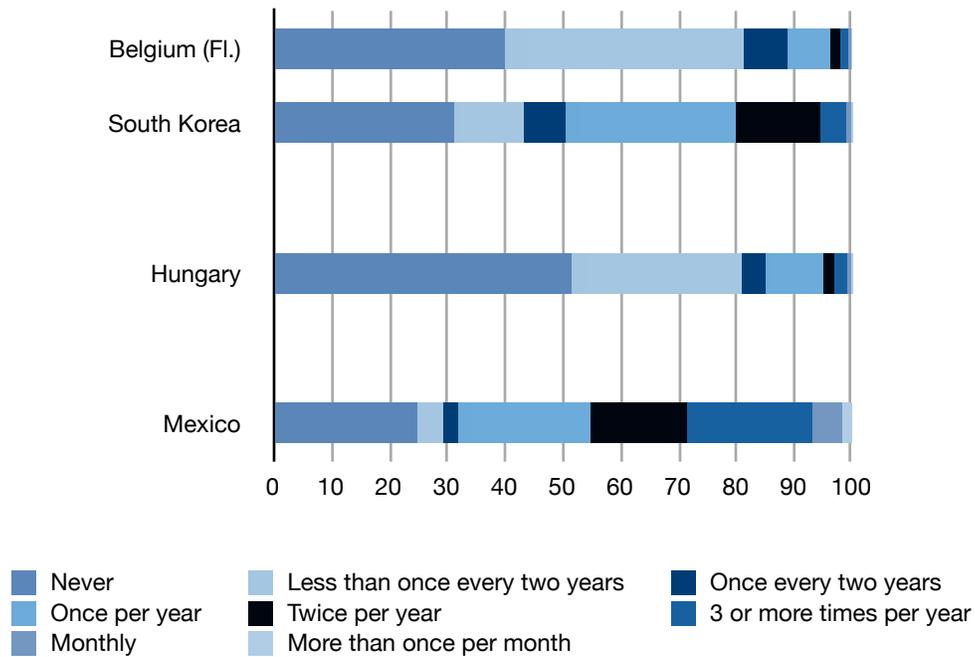
Percentage of teachers by frequency of internal evaluations, secondary, 2008



Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 5.3.
 Note: These figures focus only on evaluations conducted by principals, not peers.

On the other hand, between 20 and 40% of teachers in successful education systems with data are never evaluated externally. In some of these systems, such as Belgium (Fl.) and Hungary, only a minority of teachers are evaluated at least once every two years; in others, such as South Korea and Mexico, most teachers are evaluated at least once every two years.

Percentage of teachers by frequency of external evaluations, secondary, 2008

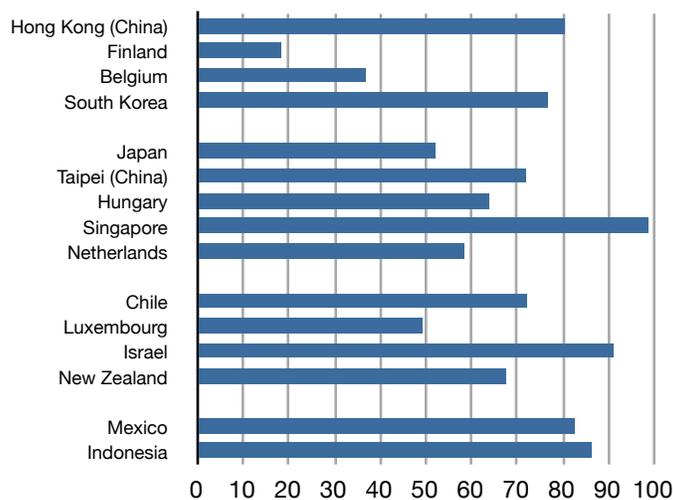


Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 5.3.

iii. How many sources do teacher evaluations rely on?

With the exception of Finland, Belgium and Luxembourg, most students in successful education systems attend schools that use student achievement data to evaluate teachers. In fact, in Hong Kong-China, Singapore, Israel, Mexico and Indonesia, as many as 80% of students go to these schools.

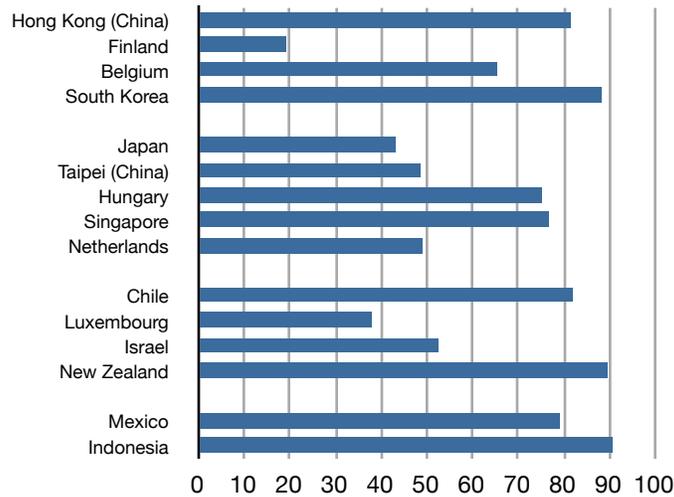
Percentage of students in schools using student assessments to evaluate teachers, 2009



Source: OECD (2010). *PISA 2009 Results: What Makes a School Successful?* Table IV.3.15.

Peer reviews are used in teacher evaluations in most secondary schools in successful systems, except in Finland, Japan, Taipei-China and Luxembourg. In fact, in Hong Kong-China, South Korea, Chile, New Zealand and Indonesia, 80% or more of students attend schools where this is the case.

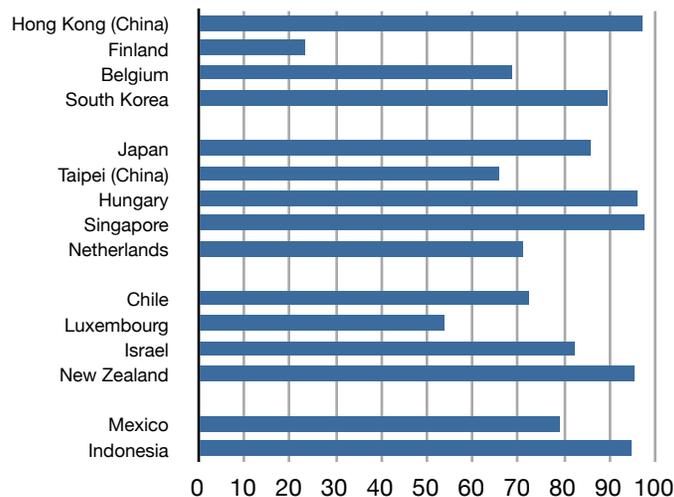
Percentage of students in schools using peer reviews to evaluate teachers, 2009



Source: OECD (2010). *PISA 2009 Results: What Makes a School Successful?* Table IV.3.15.

With the sole exception of Finland, most secondary school students in successful systems attend schools where principal observations are used to evaluate teachers. In fact, in Hong Kong-China, South Korea, Japan, Hungary, Singapore, Chile, Israel, New Zealand and Indonesia, over 70% of students attend these schools.

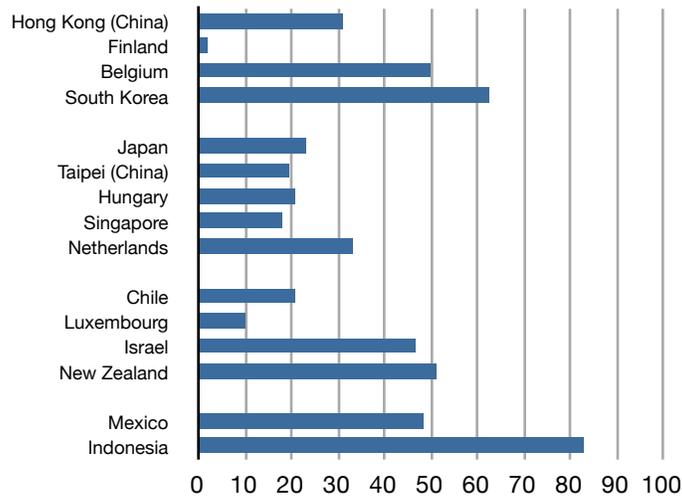
Percentage of students in schools using principal observations to evaluate teachers, 2009



Source: OECD (2010). *PISA 2009 Results: What Makes a School Successful?* Table IV.3.15.

By contrast, in most successful education systems, only a minority of secondary schools use school inspections to evaluate teachers. South Korea and Indonesia are the exception—over 50% students attend schools that use this type of teacher evaluation.

Percentage of students in schools using inspector observations to evaluate teachers, 2009

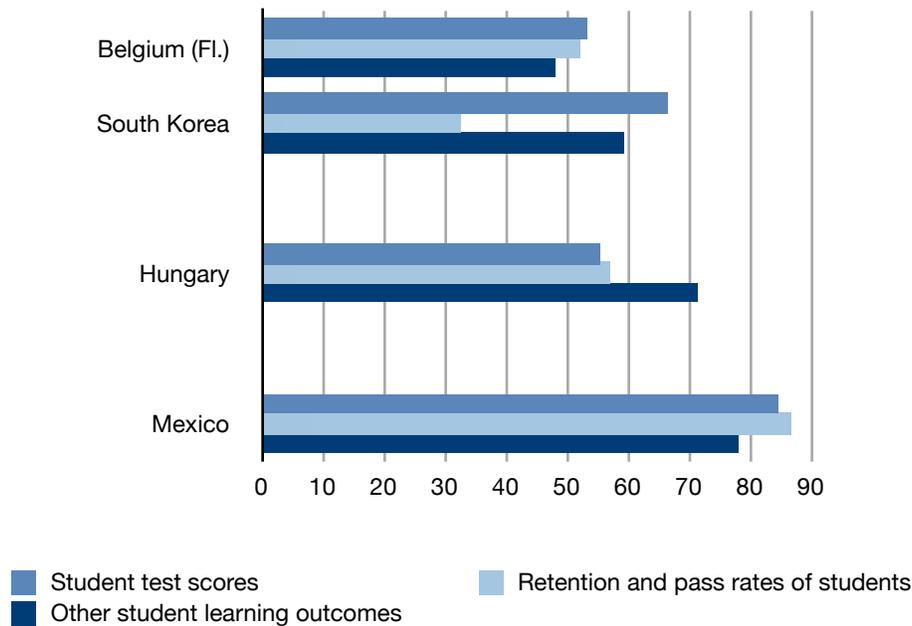


Source: OECD (2010). *PISA 2009 Results: What Makes a School Successful?* Table IV.3.15.

iv. What criteria do evaluations use to assess teaching?

Most secondary school teachers in successful education systems with data are evaluated using some type of student learning outcome—test scores, retention and pass rates or other similar measures.

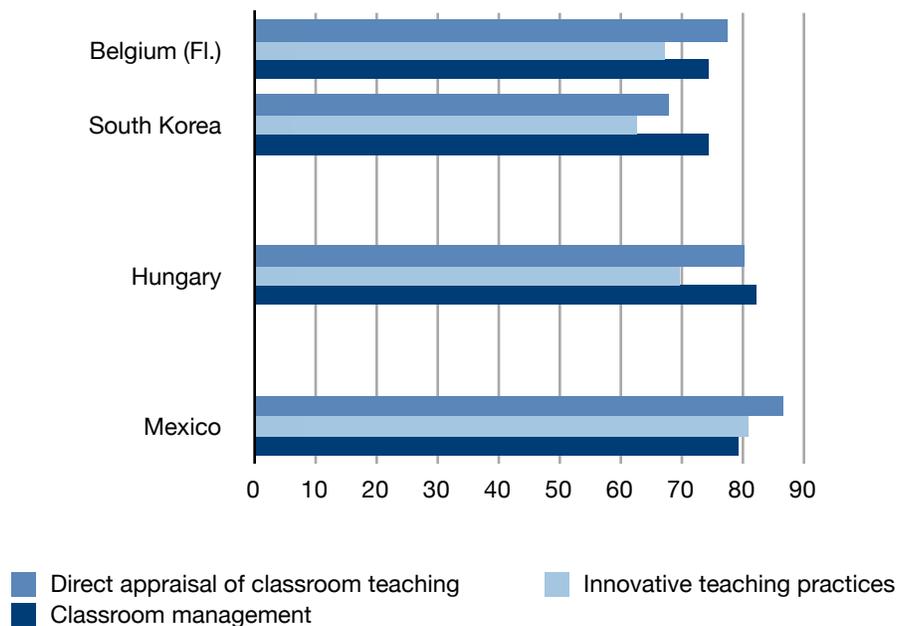
Percentage of teachers evaluated using student learning outcomes, secondary, 2008



Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 5.4.

Most secondary school teachers in successful education systems with data are also evaluated on the basis of some classroom measure, such as direct appraisals of classroom teaching, innovative teaching practices or classroom management.

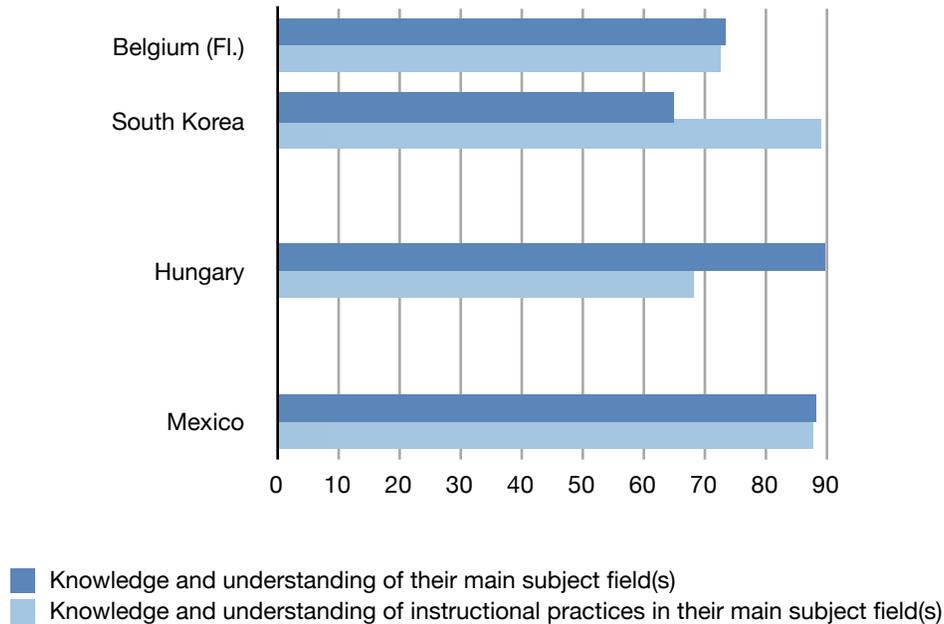
Percentage of teachers evaluated using classroom measures, secondary, 2008



Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 5.4.

Finally, most successful education systems also use measures of subject matter knowledge to evaluate teachers, including not only subject-specific academic knowledge but also subject-specific pedagogical knowledge (i.e., knowledge of how to teach a particular subject).

Percentage of teachers evaluated using knowledge measures, secondary, 2008



Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 5.4.

v. Are teachers required to participate in evaluations? **(See 6.b.i)**

vi. How many teachers fail their evaluations?

No data were available on this indicator.

vii. Is it possible to track teachers over time?

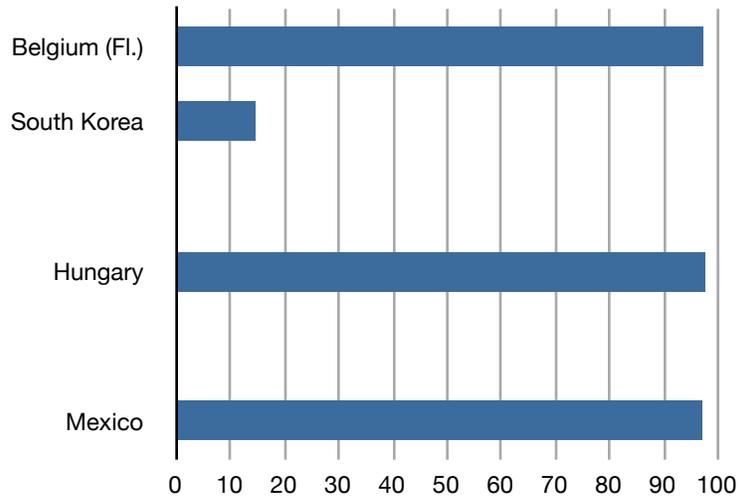
No data were available on this indicator.

7. Supporting Teachers to Improve Instruction

a. Is teacher performance data used to improve teaching?

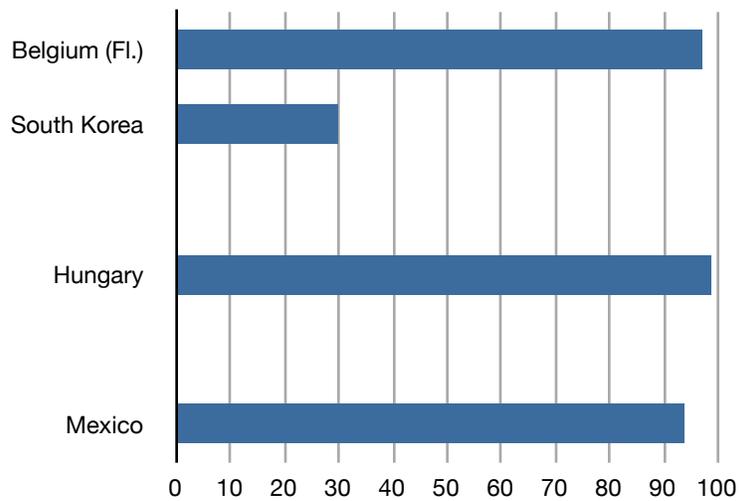
i. Are teacher performance evaluations used to inform classroom practice?

Percentage of teachers who receive the outcome of principal evaluations, secondary, 2008



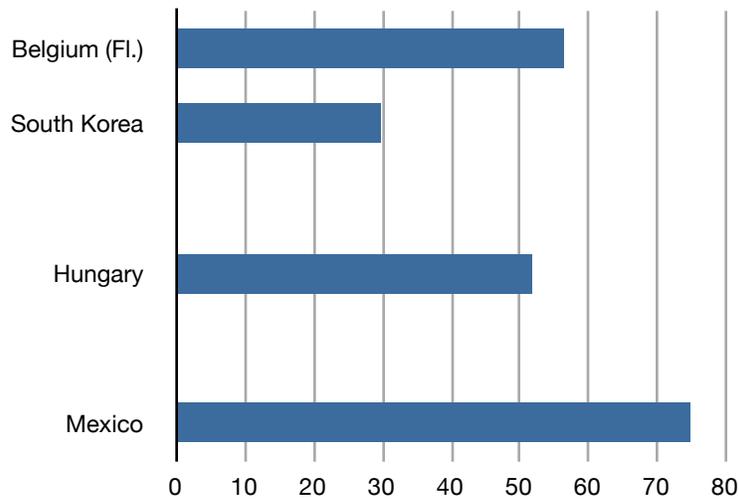
Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 5.6.
Note: Figures include instances when this occurs "most of the time" or "always."

Percentage of teachers who discuss how to improve with their principal, secondary, 2008



Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 5.6.
Note: Figures include instances when this occurs "most of the time" or "always."

Percentage of teachers who receive improvement plans from principals, secondary, 2008



Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 5.6.

Note: Figures include instances when this occurs "most of the time" or "always."

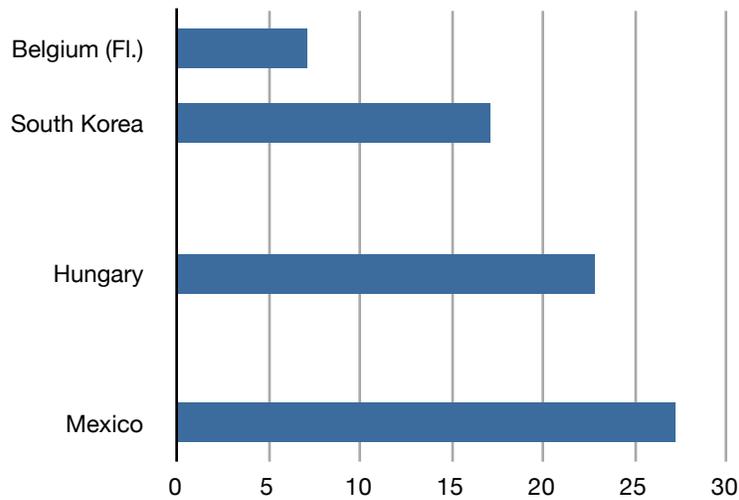
ii. If a teacher obtains an unsatisfactory result in an evaluation, is he or she assigned to a supervisor?

No data were available on this indicator.

iii. Are teacher performance evaluations used to assign professional development?

Successful education systems vary somewhat in the extent to which they link teacher evaluations to professional development priorities. In all systems with data, less than 30% of secondary school teachers work in schools where this link exists and in systems such as Belgium (Fl.), less than 10% of teachers work in this type of schools.

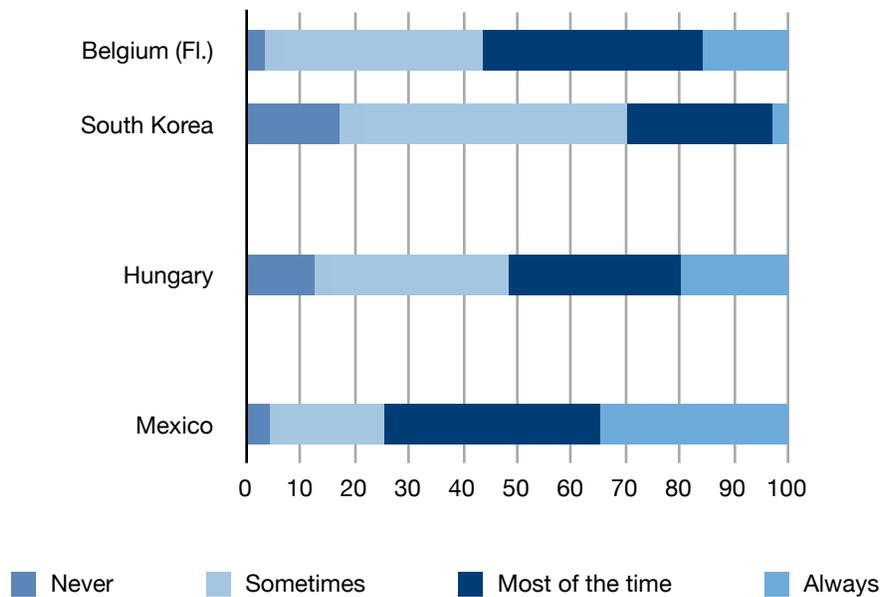
Percentage of teachers with professional development resulting from evaluations, secondary, 2008



Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 5.5.

Interestingly, however, while it may not be an official policy, most secondary school teachers in successful education systems with data have been assigned to professional development as a result of an evaluation—at least on some occasions.

Percentage of teachers assigned to professional development due to evaluations, secondary, 2008

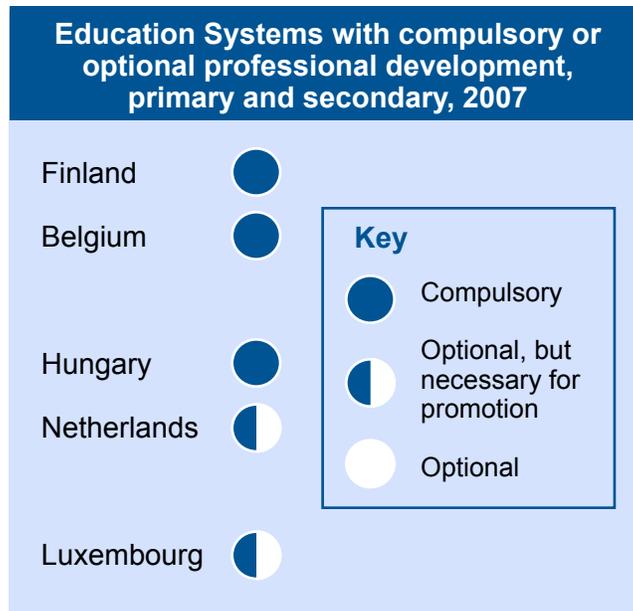


Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 5.6.

b. Is there professional development to improve practice?

i. *Are primary school teachers required to participate in professional development?*

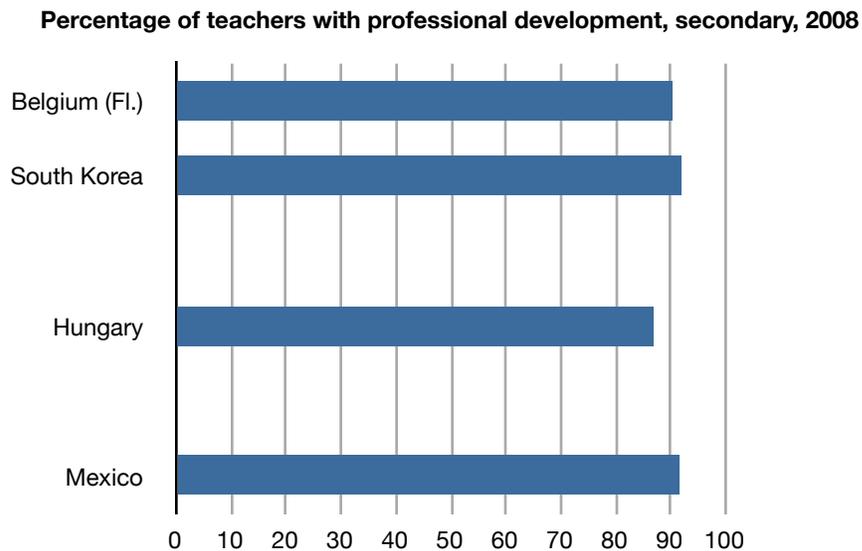
All successful education systems with data either make professional development compulsory for all teachers or a requirement for promotion. This applies to both primary and secondary school students.



Source: Eurydice (2009). Key Data on Education in Europe 2009.

ii. Are secondary school teachers required to participate in professional development?

Internationally comparable data on the share of teachers with professional development is hard to come by, but successful education systems that report this information indicate that over 85% of their secondary school teachers have undergone some form of professional development.



Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 3.1.

iii. How many days of professional development are primary school teachers required to complete?

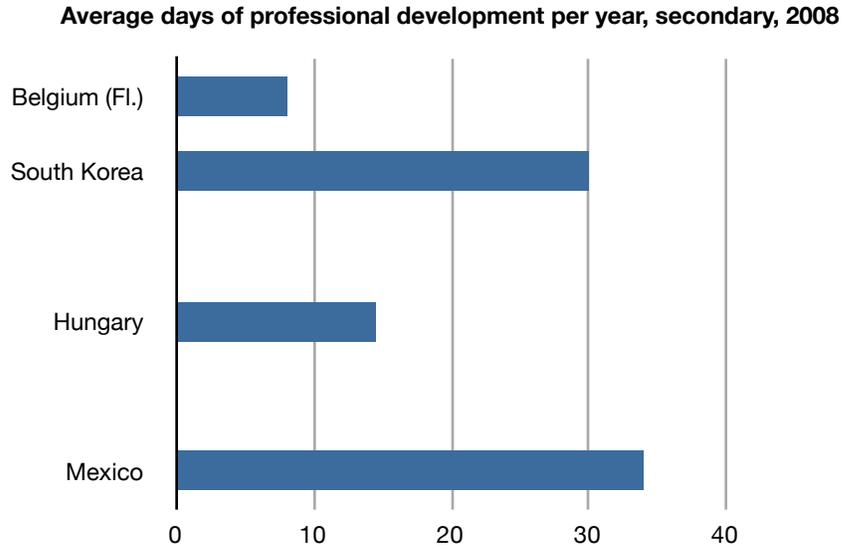
Data on the length of required professional development is even harder to find. Further, while some countries have required days of professional development, others have requirements in number of hours and it is hard to make these two types of criteria comparable without making non-trivial assumptions. Among those systems that report requirements in days, they range from 1 to 6 days. Among those that report requirements in hours, they range from 120 to about 170 hours.

Required hours/days of professional development, 2004	
Finland	1-5 days
Belgium (Fl.)	None
Belgium (Fr.)	6 half-days
South Korea	None
Japan	None
Hungary	120 hours (over 7 years)
Netherlands	169 hours
Chile	None
Israel	None

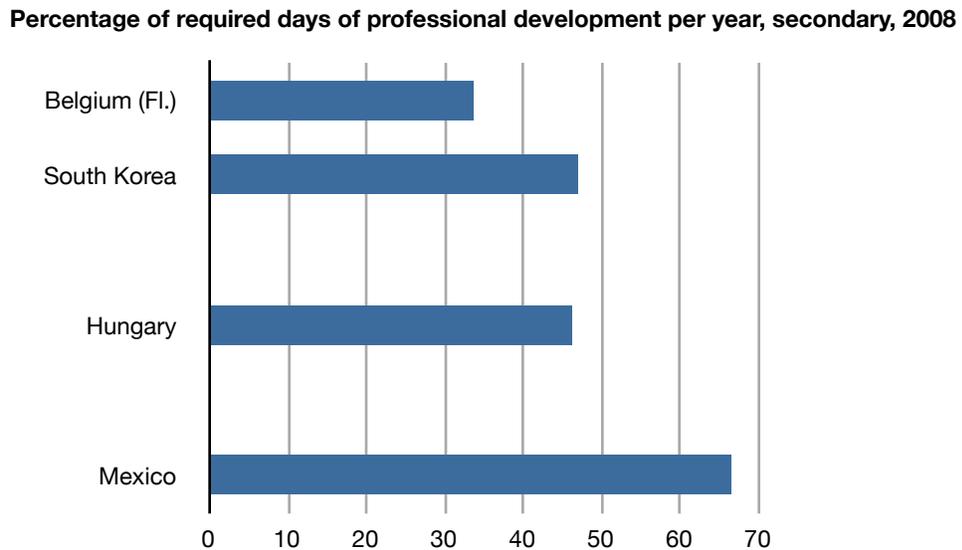
Source: OECD (2005). *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*. Table 4.3.

iv. How many days of professional development are secondary school teachers required to complete?

An alternative way of calculating required days of professional development, because of the way in which internationally comparable data are reported, is to obtain the average number of completed days of professional development and parse out the share of those days that were required. Applying this methodology for secondary school teachers, we find that the range is quite broad, from about 3 days in Belgium (Fl.) to roughly 23 days in Mexico.



Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 3.1.

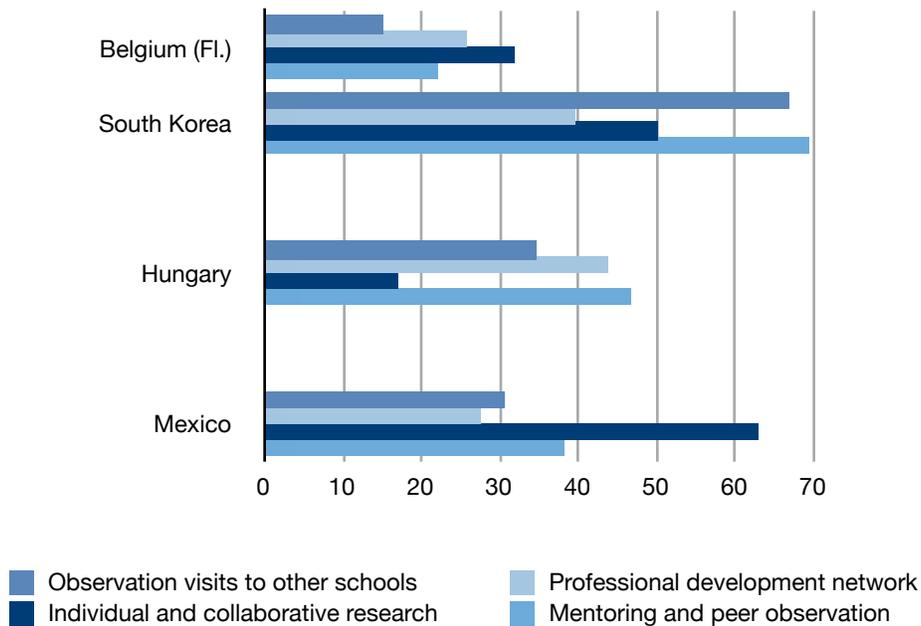


Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 3.1.

v. Does professional development include activities other than courses and workshops or education conferences and seminars?

Interestingly, a relatively low percentage of teachers participates in professional development activities other than courses and workshops or education conferences and seminars. Among successful education systems with data, only South Korea has 50% or more of secondary school teachers participating in school observations, individual and collaborative research or mentoring and school observation and most of Mexican teachers only engage in individual or collaborative research.

Percentage of teachers in non-traditional professional development, secondary, 2008

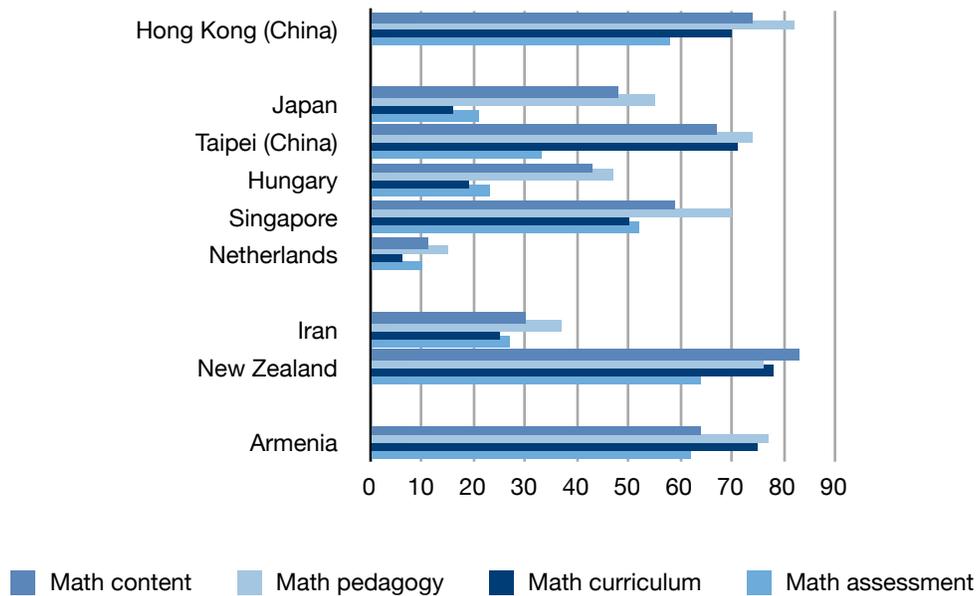


Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 3.2.

vi. How many aspects related to teaching does professional development include other than school management and administration for primary school teachers?

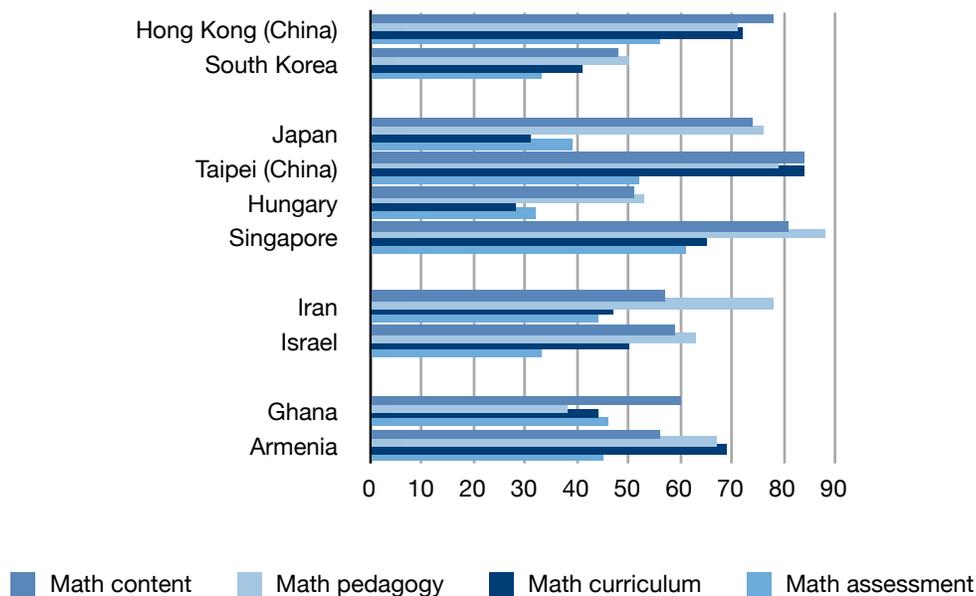
In most successful education systems with data, math content and pedagogy are the most popular non-traditional subjects of professional development for fourth- and eighth-grade math teachers. However, among eight-grade math teachers, professional development math curriculum and assessment is also quite common.

Percentage of students by math teachers' professional development, 4th grade, 2007



Source: IEA (2006). TIMSS 2007 International Mathematics Report. Exhibit 6.4.

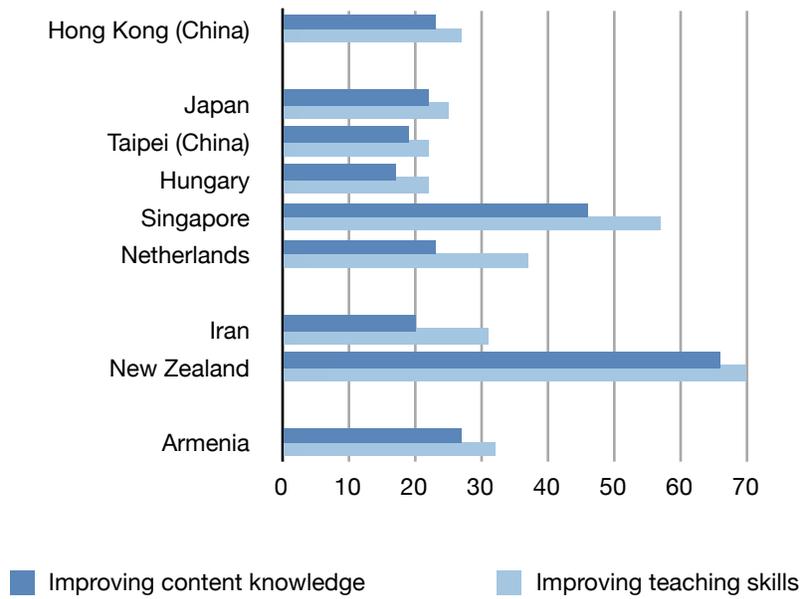
Percentage of students by math teachers' professional development, 8th grade, 2007



Source: IEA (2006). TIMSS 2007 International Mathematics Report. Exhibit 6.3.

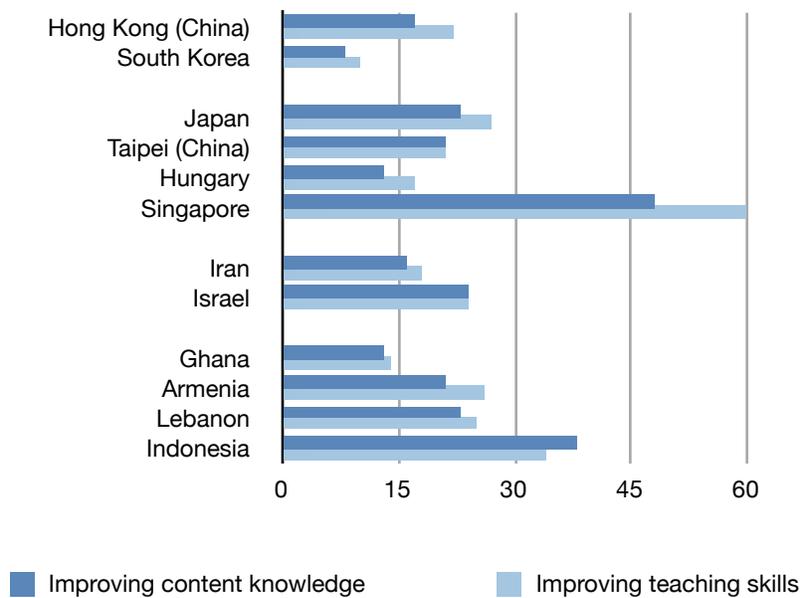
A surprisingly low share of fourth grade math teachers participates in professional development geared towards improving content knowledge or teaching skills. The two exceptions are Singapore and the Netherlands, where more than 40% of fourth grade math teachers participate in these types of activities. This also holds true for Singaporean eighth grade math teachers.

Percentage of students in schools where most math teachers have professional development, 4th grade, 2007



Source: IEA (2006). *TIMSS 2007 International Mathematics Report. Exhibit 8.10.*
 Note: Most here is used to mean between 76 and 100%.

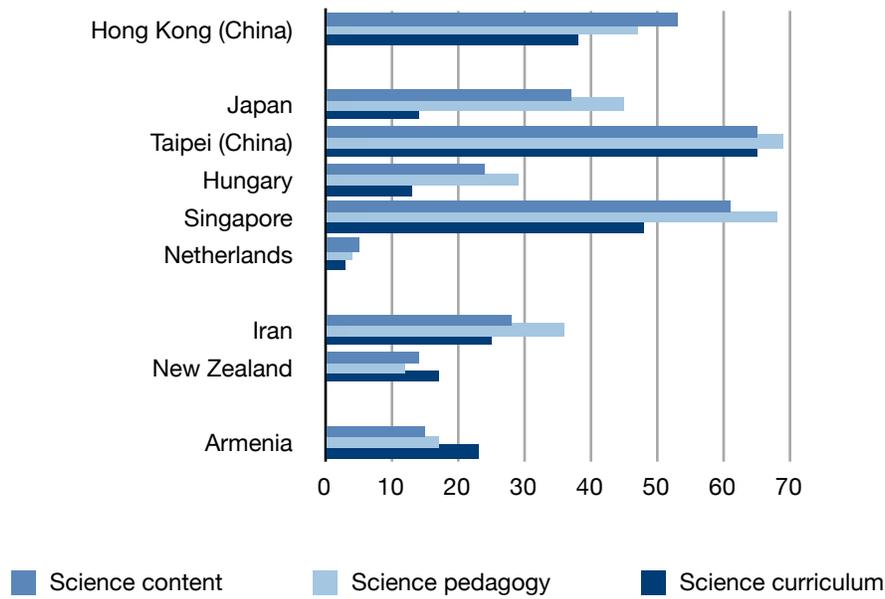
Percentage of students in schools where most math teachers have professional development, 8th grade, 2007



Source: IEA (2006). *TIMSS 2007 International Mathematics Report. Exhibit 8.10.*
 Note: Most here is used to mean between 76 and 100%.

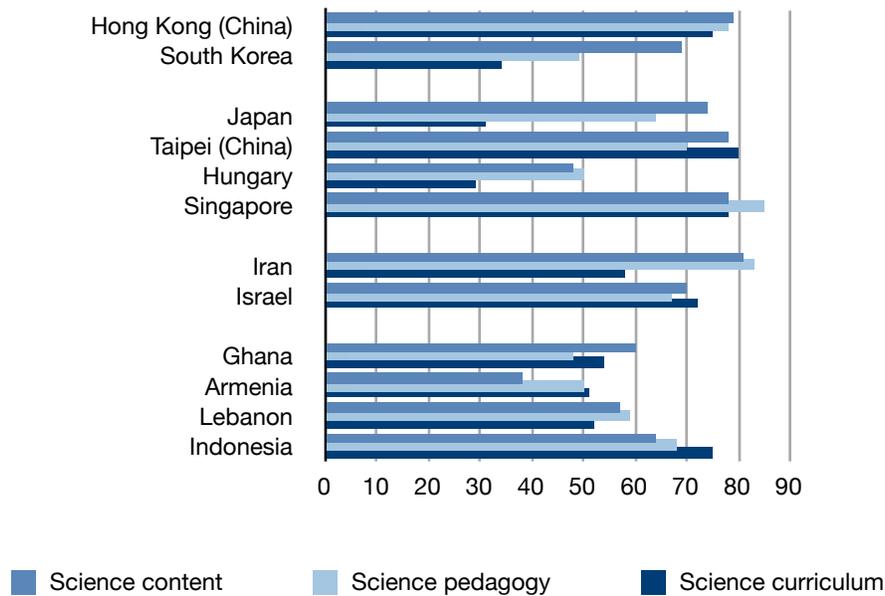
It is also surprising that, among successful education systems with data, most fourth grade science teachers do not participate in professional development activities on science content, pedagogy or curriculum, but this is the case for eighth grade science teachers in most successful systems.

Percentage of students by science teachers' professional development, 4th grade, 2007



Source: IEA (2006). TIMSS 2007 International Science Report. Exhibit 6.4.

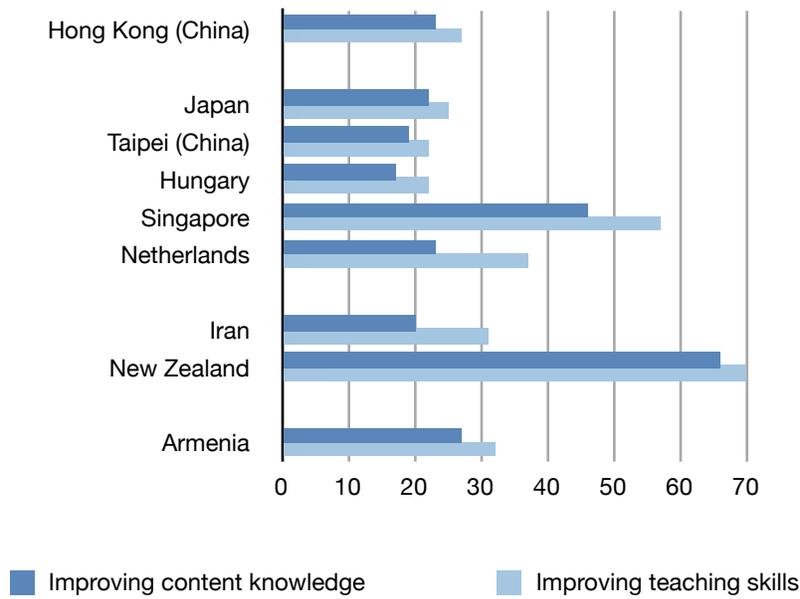
Percentage of students by science teachers' professional development, 8th grade, 2007



Source: IEA (2006). TIMSS 2007 International Science Report. Exhibit 6.4

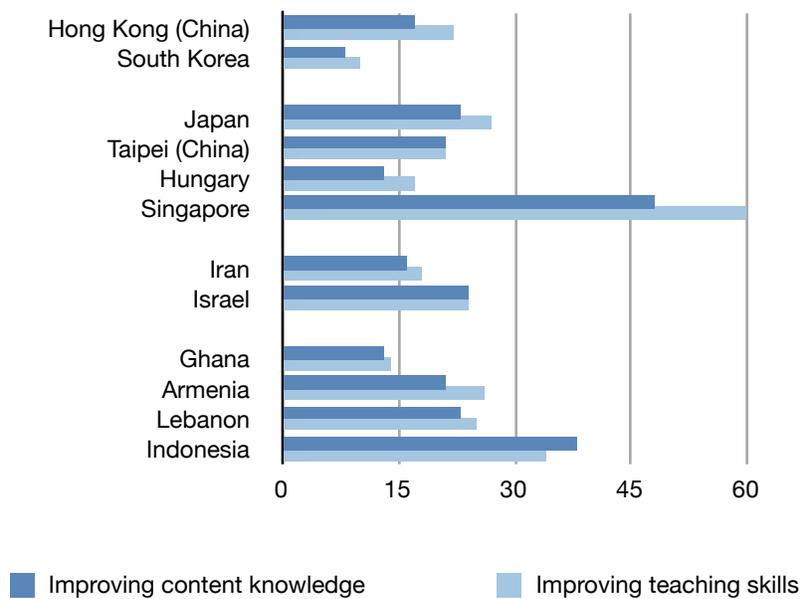
Finally, with the exception of Singapore and New Zealand in fourth grade and Singapore alone in eighth grade, very few primary school students in successful education systems go to schools where most science teachers have professional development.

Percentage of students in schools where most science teachers have professional development, 4th grade, 2007



Source: IEA (2006). *TIMSS 2007 International Science Report. Exhibit 8.10.*
 Note: Most here is used to mean between 76 and 100%.

Percentage of students in schools where most science teachers have professional development, 8th grade, 2007



Source: IEA (2006). *TIMSS 2007 International Science Report. Exhibit 8.10.*
 Note: Most here is used to mean between 76 and 100%.

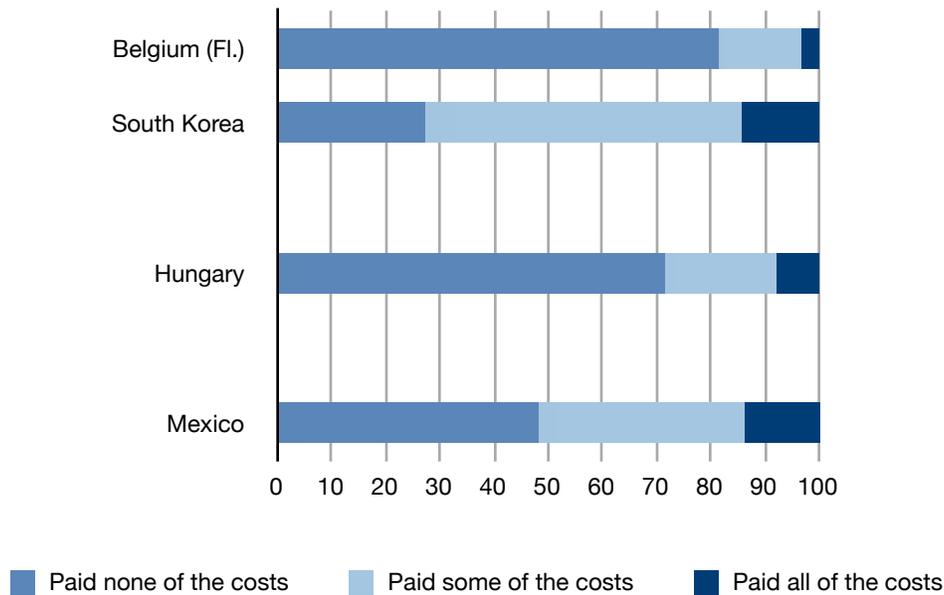
vii. How many aspects related to teaching does professional development include other than school management and administration for secondary school teachers?

No data were available on this indicator.

viii. Are individual teachers responsible for paying for their professional development?

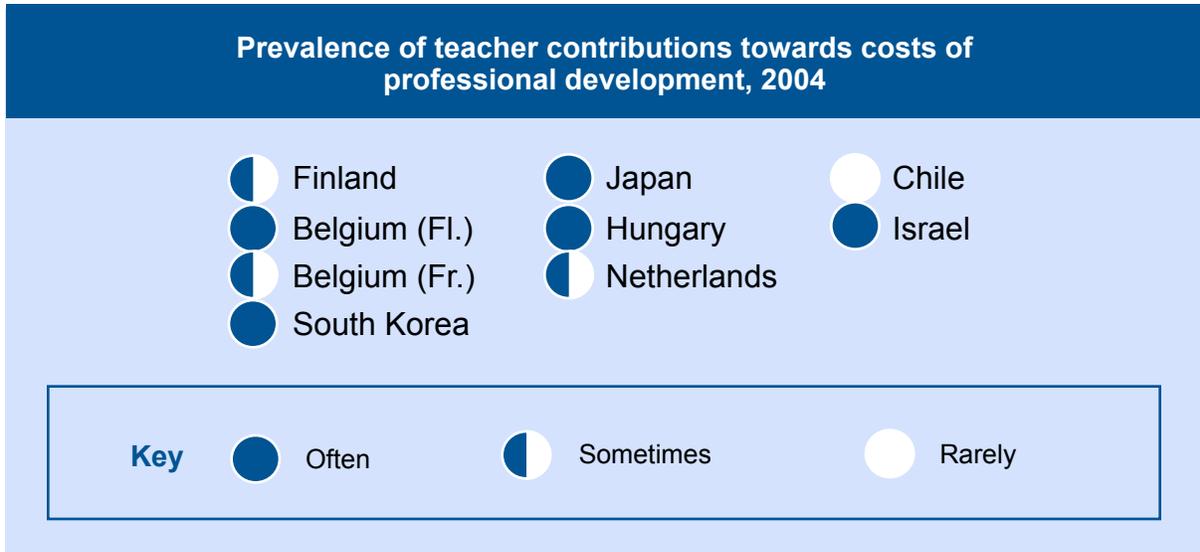
Few education systems report what share of the costs of professional development are covered by teachers. Among those that do, some systems—such as Belgium (Fl.) and Hungary—cover most of the costs for teachers and others—such as South Korea or Mexico—have teachers covering many of those costs.

Percentage of teachers by contribution to professional development costs, secondary, 2008



Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 3.5.

In fact, in many successful education systems such as Belgium (Fl.), South Korea, Japan and Israel teachers often make contributions towards professional development costs and in others such as Finland, Belgium (Fr.) and the Netherlands teachers sometimes do. The only exception to this trend among successful systems is Chile, which reports that its teachers never have to contribute towards their professional development costs.



Source: OECD (2005). *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*. Table 4.3.

8. Motivating Teachers to Perform

a. Are there minimum mechanisms to hold teachers accountable?

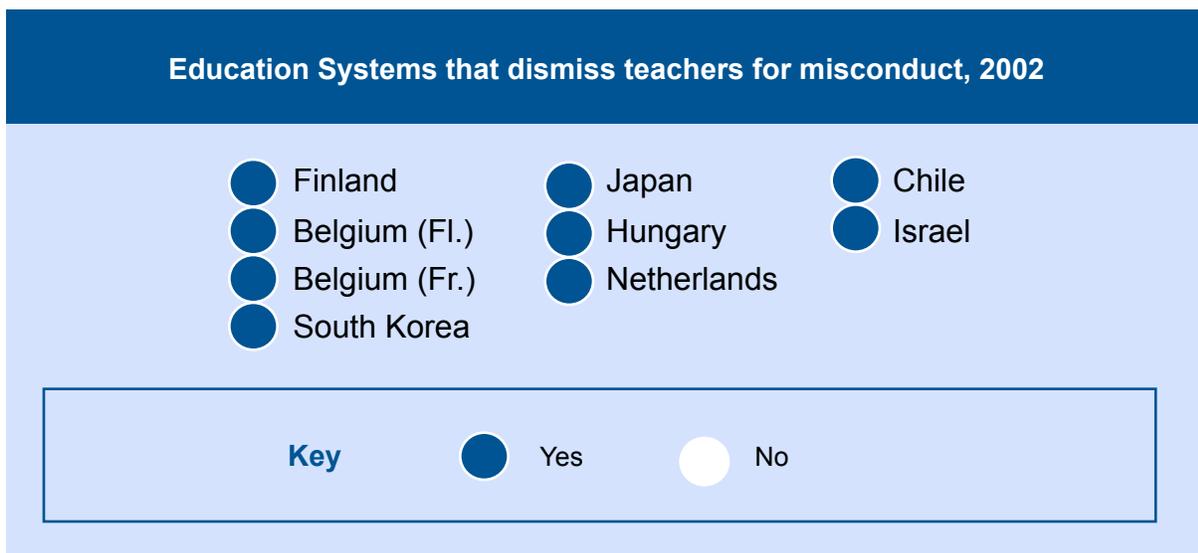
i. *Are there requirements for primary school teachers to remain in teaching?*

No data were available on this indicator.

ii. *Are there requirements for secondary school teachers to remain in teaching?*

No data were available on this indicator.

iii. *Can teachers be dismissed for misconduct or child abuse?*



Source: OECD (2005). *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*. Table 5.1.

iv. Is teacher absenteeism taken into account in teacher performance evaluations?

No data were available on this indicator.

v. Are there penalties (salary or dismissal) for teacher absenteeism?

No data were available on this indicator.

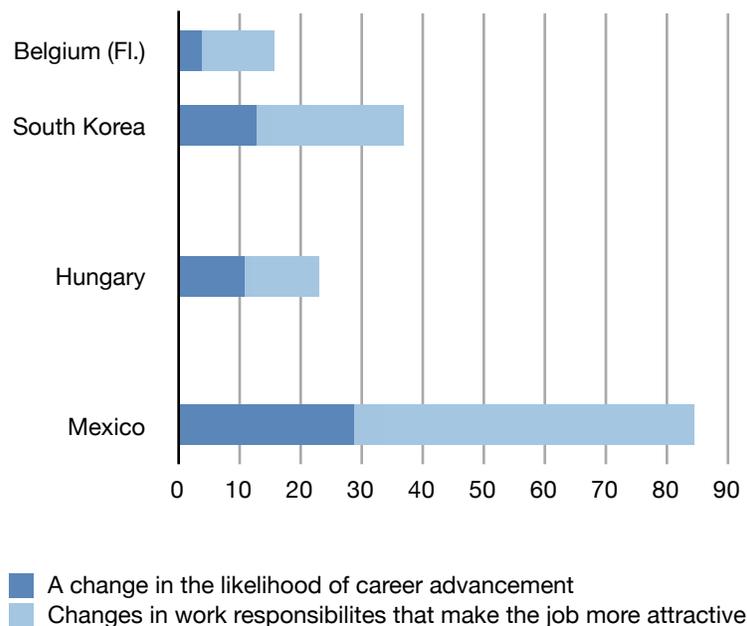
b. Are there rewards for high-performing teachers?

*i. Do high-performing teachers get higher salaries (monetary bonuses)? (See **2.b.iv**)*

ii. Do high-performing teachers get better chances of promotion?

Except in Mexico, in all successful education systems with data, teachers' chances of promotions are rarely affected by performance evaluations in secondary school.

Percentage of teachers with promotions resulting from evaluations, secondary, 2008

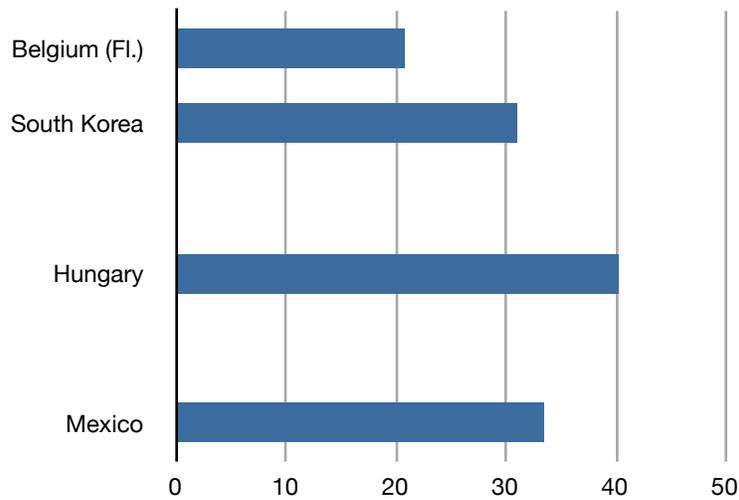


Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 5.5.

iii. Do high-performing teachers get more public recognition)?

Among successful education systems with data, only a minority of teachers receive public recognition resulting from evaluations, at least at the secondary school level.

Percentage of teachers with public recognition resulting from evaluations, secondary, 2008

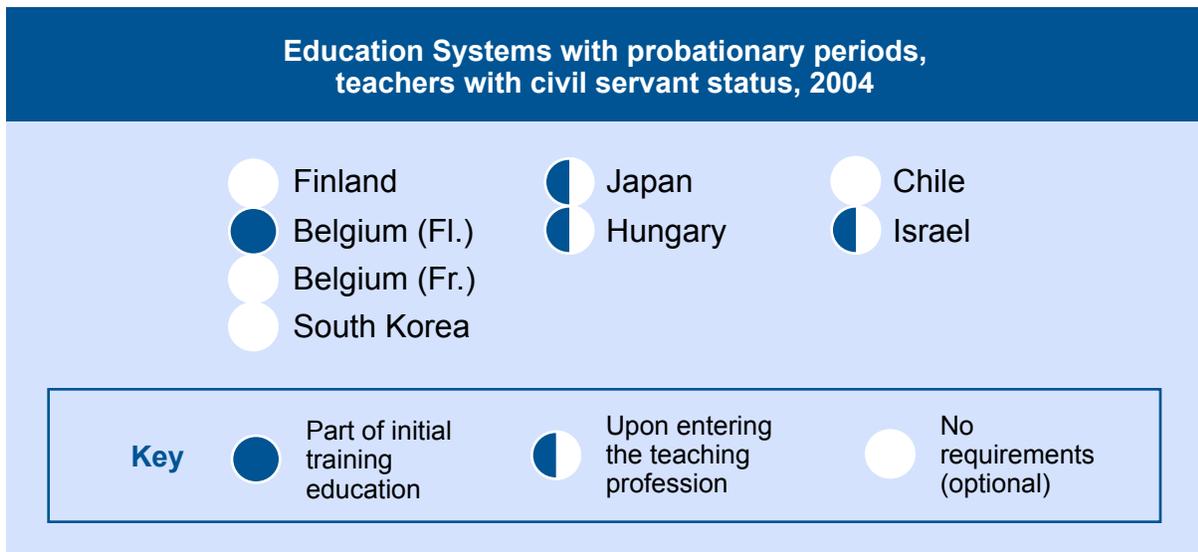


Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 5.5.

c. Are there sanctions for low-performing teachers?

i. *Is there a mandatory probation period for teachers before they are granted open-ended appointments?*

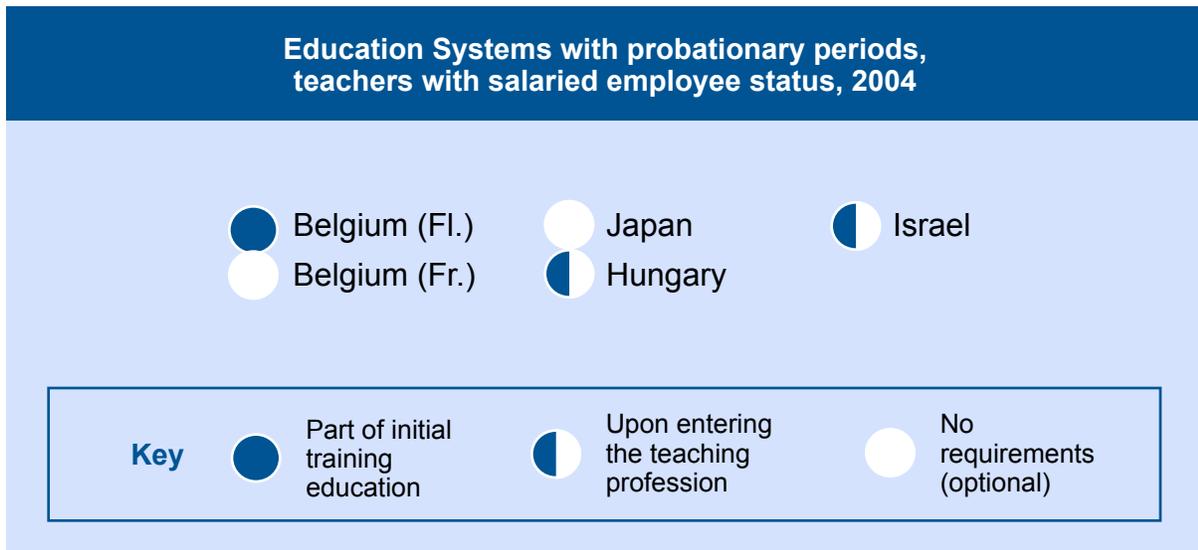
Successful education systems are divided in terms of their offering of probationary periods for civil servant status teachers. While Belgium (Fl.), Japan, Hungary and Israel have these periods either during teacher education or when teachers enter the profession, Finland, Belgium (Fr.), South Korea and Chile do not have them.



Source: OECD (2005). *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*. Table 5.3.

Few successful education systems report whether they have these periods for salaried status teachers, but among those that do, there is no clear trend. Some,

such as Belgium (Fl.), Hungary and Israel have these periods, while others, such as Belgium (Fr.) and Japan do not.



Source: OECD (2005). *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*. Table 5.3

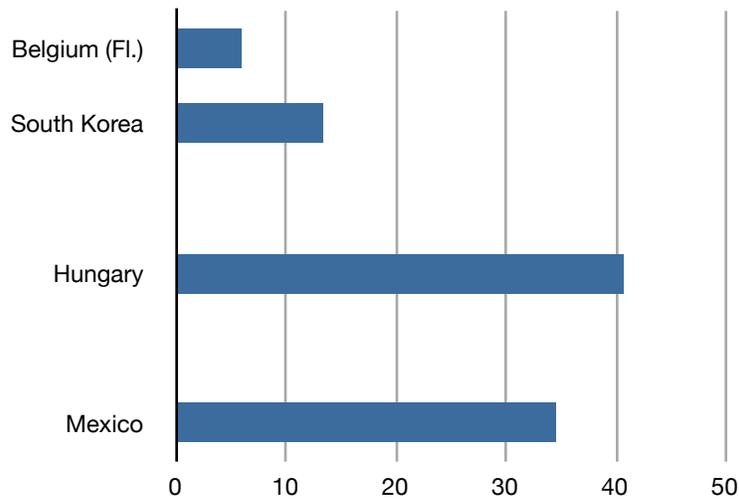
ii. *Is information from job performance evaluations used to grant open-ended appointments?*

No data were available on this indicator.

iii. *Are there pay cuts for low-performing teachers?*

Less than half of secondary school teachers in education systems with data work in schools where principals reduce the pay of poor-performing teachers. In Belgium (Fl.), the share of teachers working in these types of schools are only about 5%.

Percentage of teachers in schools that reduce the pay of poor-performing teachers, secondary, 2008

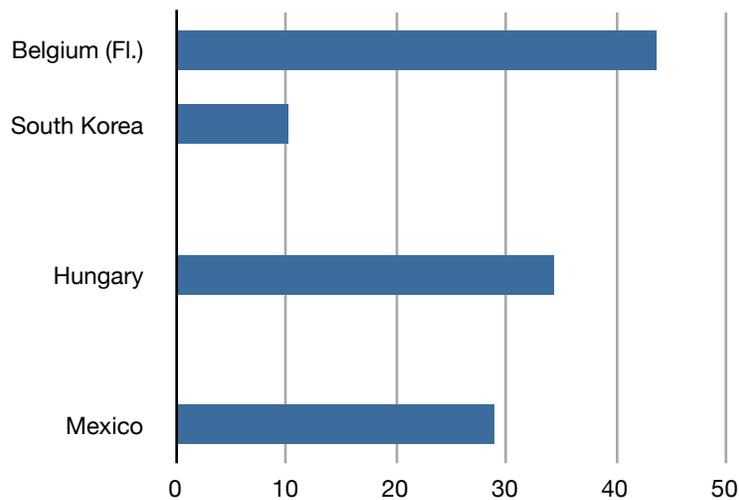


Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 5.9.

iv. Are job evaluations used to dismiss ineffective teachers?

Only a minority of secondary school teachers in successful education systems with data work in schools that dismiss teachers due to poor performance. In fact, in South Korea, the percentage of teachers in these types of schools is below 10%.

Percentage of teachers in schools that dismiss poor-performing teachers, secondary, 2008



Source: OECD (2009). *Creating Effective Teaching and Learning Environments - First Results from TALIS*. Table 5.9.

V. How Will This Note Be Updated?

This note will be updated as more international student achievement data emerge and as methods to identify successful education systems continue to develop.

Altinok and his colleagues are preparing an update of their most recent database that will include PISA 2009 results and Patrinos and Schlotter are working on a similar update. These updates will provide more international student achievement data that we can use to identify top-performing and rapidly-improving education systems. Therefore, we plan to adjust our benchmarking exercise to the new education systems identified by forthcoming analyses by these and other authors employing similar methods.

This note will also be updated as more data on the teacher policies of top-performing and rapidly-improving education systems becomes publicly available.

This includes not only updates in international databases such as the OECD's TALIS, but also data collected through SABER-Teachers in successful education systems. In fact, with time, we aim to be able to do this benchmarking exercise entirely with data from SABER-Teachers, which will be entirely comparable across countries and that will provide complete information on all of the indicators of the SABER-Teachers policy goals.

In the mean time, we are using this benchmarking exercise jointly with a review of the evidence to determine, to the best of our ability, the optimal teacher policies.

While evidence on the teacher top-performing and rapidly-improving systems continues to develop, we are using the information provided by this benchmarking exercise jointly with a comprehensive research review of policies with potential to impact teaching and learning to identify the policies education systems should adopt to have an effective teaching force. We are aware of the fact that identifying such processes will be an iterative process, but we believe that it is useful to make the best out of the information that currently exists.

APPENDIX A

Table A.1: Review of Existing International “Benchmarking” Efforts

Databases				
Citation	Criteria	Systems	Methodology	Teacher Policies
Eurydice (1999-2009). <i>Key Data on Education in Europe</i> . Brussels, Belgium: Education, Audiovisual and Cultural Executive Agency (EACEA).	Member countries of the EU	Austria, Belgium, Bulgaria, Cyprus, Czech Rep., Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovak Rep., Slovenia, Spain, Sweden and the UK	Data from Eurydice network, Eurostat, PISA and PIRLS	<ol style="list-style-type: none"> 1. Concurrent model of teacher training is the preferred pathway 2. Teacher education is professionally-oriented for pre-primary teachers, occupationally-oriented for primary teachers and academically-oriented for secondary teachers 3. Clinical teacher of teacher training exists in few countries 4. Support for teachers is increasing 5. Professional development is mandatory 6. Most teachers spend less than 35 hours on training for teaching reading 7. Teachers are career civil servants in only a few EU countries 8. Support for teachers is increasingly regulated 9. Special support for reading difficulties is offered outside of the classroom 10. Teacher contracts factor in non-teaching time 11. Number of required teaching hours varies widely across countries 12. Official retirement age for teachers is generally 65 13. Seniority is the main factor influencing teacher salaries.
Case Studies				
Citation	Criteria	Systems	Methodology	Teacher Policies
Auguste, B., Kihn, P. & Miller, M. (2010). “Closing the Talent Gap: Attracting and Retaining Top-Third Graduates to Careers into Teaching.” London, UK: McKinsey & Co.’s Social Sector Office.	High performance in international tests	Finland, Korea and Singapore	Review of analyses and interviews with policy-makers	<ol style="list-style-type: none"> 1. Selective admissions to teacher training are selective 2. Government-funded teacher training 3. Government regulation of teacher supply to match demand 4. Professional working environment 5. Competitive compensation 6. High prestige of the profession 7. Opportunities for career advancement 8. Performance pay

<p>Darling-Hammond, L. (2010). "Steady Work: How Countries Build Successful Systems" and "Doing What Matters Most: Developing Competent Teaching." In <i>The Flat World and Education: How America's Commitment to Equity Will Determine Our Future</i>. New York, NY: Teachers College Press.</p>	<p>High performance in international tests</p>	<p>Finland, Korea and Singapore (including comparisons with OECD countries)</p>	<p>Review of analyses and interviews with policy-makers</p>	<p>Finland:</p> <ol style="list-style-type: none"> 1. Extension of teacher training 2. Selection into teacher training 3. Clinical experience component of teacher training 4. Time and space allotted for collaboration for teachers at school 5. Teachers' capacity to create challenging curricula 6. Teachers' dual master's degrees in their subject matter and in education.
				<p>Korea:</p> <ol style="list-style-type: none"> 1. Compulsory training and exams to enter the profession 2. High respect attributed to the profession 3. Automatic tenure upon hiring 4. Highly desirable working conditions 5. Induction programs for beginning teachers 6. Personal learning opportunities for teachers 7. Career opportunities and salary incentives
				<p>Singapore:</p> <ol style="list-style-type: none"> 1. Link between curriculum and teachers' pre- and in-service training 2. Active recruitment for and government coverage of training costs 3. Reform in teacher training to augment teachers' pedagogical knowledge and expand practicum training in exemplary schools 4. Close collaboration between expert and novice teachers 5. Government-subsidized professional development 6. Opportunities for collaboration among teachers 7. Principal training at the government's expense with school apprenticeships
<p>Darling-Hammond, L. & Rothman, R. (Eds.) (2011). <i>Teacher and Leader Effectiveness in High-Performing Education Systems</i>. Washington, DC: Alliance for Excellent Education & Stanford, CA: Stanford Center for Opportunity Policy in Education (CREDO).</p>	<p>High performance in international tests</p>	<p>Finland, Ontario (Canada) and Singapore</p>	<p>Review of analyses and interviews with policy-makers</p>	<ol style="list-style-type: none"> 1. Systemic approach to teacher effectiveness 2. Strong recruitment and preparation 3. Attractive teaching conditions 4. Continuous support to improve learning 5. Proactive leadership development policies in place.

Goldhaber, D. (2009). "Lessons from Abroad: Exploring Cross-Country Differences in Teacher Development Systems and What They Mean for U.S. Policy." In D. Goldhaber & J. Hannaway (Eds.) <i>Creating a New Teaching Profession</i> . Washington, DC: The Urban Institute.	Participation in assessment of math teachers	Bulgaria, Germany, Korea, Mexico, Taiwan and the United States	Review of analyses and descriptive statistics	<ol style="list-style-type: none"> 1. High status of the profession 2. Multiple pathways into the profession 3. Experimentation with incentives
	Industrialized countries with contrasting learning outcomes	Germany and Korea		

Cross-National Comparisons

Citation	Criteria	Systems	Methodology	Teacher Policies
Asia Society (2011). <i>Improving Teacher Quality around the World. The International Summit of the Teaching Profession</i> . Asia Society: New York, NY.	Top-performing and rapidly-improving countries in 2009 PISA	Belgium, Brazil, Canada, China, Denmark, Estonia, Finland, Hong Kong (China), Japan, the Netherlands, Norway, Poland, Singapore, Slovenia, the United Kingdom and the United States	Presentations by policy-makers, union leaders, teachers and education experts	<ol style="list-style-type: none"> 1. Raising the quality of initial teacher training 2. Attracting high-quality and motivated teachers—especially, from underrepresented backgrounds 3. Creating a more robust evidence base for teaching and learning 4. Providing comprehensive but cost-effective professional development 5. Redesigning training for school principals and school boards 6. Creating teacher appraisal systems that promote improvement 7. Engaging key stakeholders in the policy-making process
Barber, M. & Mourshed, M. (2007). "How the World's Top-Performing School Systems Come Out on Top." London, UK: McKinsey & Co.'s Social Sector Office.	Top 10 in 2003 PISA	Alberta (Canada), Australia, Belgium, Finland, Hong Kong, Japan, Netherlands, New Zealand, Ontario (Canada), Singapore, South Korea.	Interviews with policy-makers	<ol style="list-style-type: none"> 1. Attracting top candidates into teaching 2. Developing these people into effective instructors 3. Tackling student failure quickly by assigning struggling students to outstanding teachers

	Improvement in NAEP or TIMSS	Atlanta (US), Boston (US), Chicago (US), England (UK), Jordan, New York (US) and Ohio (US).		
	Launching major reforms	Bahrain, Brazil, Qatar, Saudi Arabia and UAE.		
Barber, M. & Mourshed, M. (2009). "Shaping the Future: How Good Education Systems Can Become Great in the Decade Ahead." Report on the International Education Roundtable. 7 July 2009, Singapore.	Not specified	Alberta (Canada), Hong Kong (China), China, Sweden, the United States and Victoria (Australia)	Expert opinion	<ol style="list-style-type: none"> 1. Recruiting top talent into teaching 2. Supporting and managing teachers and leaders to be successful and to retain them 3. Establishing a model of teaching practice and embed it in instruction and professional development 4. Offering leadership development to school leaders.
Carnoy, M., Brodziak, I., Luschei, T., Bateille, T. & Loyalka, P. (2009). <i>Do Countries Paying Teachers Higher Relative Salaries Have Higher Student Mathematics Achievement?</i> Amsterdam, the Netherlands: International Association for the Evaluation of Educational Achievement (IEA).	Volunteer participation and additional convenience sampling	Australia, Botswana, Bulgaria, Canada, Chile, Finland, France, Georgia, Germany, Hong Kong (China), Italy, Korea, Malaysia, Mexico, Norway, Oman, Philippines, Poland, Russian Federation, Singapore, Spain, Switzerland, Taipei (China), Thailand, the United Kingdom and the United States	Multivariate regression analysis with TEDS-M results	<ol style="list-style-type: none"> 1. Successful systems are clustered in the high-paying group: Chile, Finland, Hong Kong, Korea, Singapore, Taipei (China) and the United Kingdom

<p>Center for Research in Mathematics and Science Education. (2010). <i>Breaking the Cycle: An International Comparison of U.S. Mathematics Teacher Preparation</i>. East Lansing, MI: Michigan State University.</p>	<p>Volunteer participation</p>	<p>Norway, Philippines, Poland, Russian Federation, Singapore, Spain, Switzerland, Taipei (China), Thailand and the United States</p>	<p>Surveys and assessments of future teachers</p>	<ol style="list-style-type: none"> 1. Middle-school math teacher preparation in the US is weak, but that for elementary teachers is slightly better 2. In top-achieving systems, middle school preparation programs allocated half of their course taking to preparation on formal math and half either to math or general pedagogy 3. Top education systems had 90% of their future teachers taking a two-course sequence in calculus and a course in linear algebra 4. Teachers entering initial teacher training in the best systems have already been exposed to a rigorous math curriculum
<p>Mourshed, M., Chijioke, C. & Barber, M. (2010). "How the World's Most Improved School Systems Keep Getting Better." London, UK: McKinsey & Co.'s Social Sector Office.</p>	<p>Sustained, significant or widespread gain on universal scale of international student assessments from 1964 to 2010</p>	<p>Sustained improvers: Aspire Public Schools (US), Boston, MA (US), England (UK), Hong Kong, Korea, Latvia, Lithuania, Long Beach, CA (US), Ontario (Canada), Poland, Saxony (Germany), Singapore and Slovenia.</p> <p>Promising starts: Armenia, Chile, Ghana, Jordan, Madhya Pradesh (India), Minas Gerais (Brazil) and Western Cape (South Africa).</p>	<p>Database of historical interventions collected through document analysis and interviews with policy makers</p>	<p>"Stage dependent" interventions:</p> <ol style="list-style-type: none"> 1. Providing scaffolding for low-skilled teachers (poor to fair) 2. Ensuring teacher and school accountability (fair to good) 3. Ensuring teaching and leadership are regarded as full-fledged professions (good to great) 4. Putting in place the necessary practices and career paths to ensure the profession is clearly defined (good to great) <p>"Cross-stage" interventions:</p> <ol style="list-style-type: none"> 1. Ensuring an appropriate remuneration level for teachers and principals

<p>OECD (2009). <i>Evaluating and Rewarding the Quality of Teachers. International Practices</i>. Paris, France: Organisation for Economic Co-operation and Development (OECD).</p>	<p>Education systems that have innovations on the issues of teacher pay</p>	<p>Argentina, Australia, Belgium, Bolivia, Brazil, Canada, Chile, China, Colombia, Denmark, El Salvador, Estonia, Finland, France, Germany, Honduras, Iceland, India, Ireland, Israel, Italy, Japan, Kenya, Korea, Mexico, the Netherlands, New Zealand, Nicaragua, Norway, Panama, Paraguay, Peru, Portugal, Singapore, Sweden, Switzerland, Turkey, the United Kingdom, the United States, Uruguay</p>	<p>Review of analyses</p>	<ol style="list-style-type: none"> 1. There are financial and non-financial incentives for teachers 2. Incentives are often given for teachers' knowledge and skills, for teaching in shortage subject areas, for teaching in schools with difficult environments and/or for improvements in student achievement 3. When designing an incentives program, it is important to consider: the incentive structure, the unit of accountability, the performance measures, the performance standards and thresholds, the size and distribution of bonuses, the payout frequency and cultural considerations 4. When implementing an incentives program, it is important to consider: stakeholder engagement and communication strategies, potential consequences if educators are not engaged in the formation of policies on compensation and desirable practices in communication and stakeholder engagement
<p>OECD (2009). <i>Creating Effective Teaching and Learning Environments. First results from TALIS</i>. Paris, France: Organisation for Economic Co-operation and Development (OECD).</p>	<p>Volunteer participation</p>	<p>Australia, Austria, Belgium (Fl.), Brazil, Bulgaria, Denmark, Estonia, Hungary, Iceland, Ireland, Italy, Korea, Lithuania, Malaysia, Malta, Mexico, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain and Turkey</p>	<p>Survey of teachers and principals</p>	<ol style="list-style-type: none"> 1. Systems with more pronounced instructional leadership link teacher appraisals to professional development and schools 2. Relatively weak evaluation structures and lack of school evaluations and teacher appraisal and feedback 3. Teachers participate in professional development for one day a month

OECD (2011). <i>Strong Performers and Successful Reformers in Education: Lessons from PISA for the United States</i> . Paris, France: Organisation for Economic Co-operation and Development (OECD)	<ol style="list-style-type: none"> 1. High school enrollment 2. 2009 PISA ranking 3. Scores of top students 4. Weak link between learning and poverty 5. Efficient spending 	Canada, Shanghai (China), Hong Kong (China), Finland, Japan, Singapore, Poland, United States, United Kingdom	Review of analyses and interviews with policy-makers	<ol style="list-style-type: none"> 1. Attracting high-quality teachers 2. Preparing high-quality teachers 3. Developing teacher quality once teachers are in the workforce 4. Fostering the professionalization of teaching 5. Developing capable school leaders 6. Providing a work organization in which teachers can use their potential
	Progress in 1-5 above	Brazil and Germany		
OECD (2011). <i>PISA 2009 Results: What Makes a School Successful? Resources, Policies and Practices. Vol. IV</i> . Paris, France: Organisation for Economic Co-operation and Development (OECD).	Performance above OECD average in reading and below OECD-average impact of poverty on student outcomes	Canada, Estonia, Finland, Iceland, Japan, Korea and Norway (and other systems close to meeting the criteria)	Multivariate regression analysis with PISA 2009 results	<ol style="list-style-type: none"> 1. No link between school autonomy over teacher hiring, teacher firing, teachers' starting salaries or salary increases and student performance 2. Association between higher teachers' salaries (but not reducing class size) with better student performance
OECD (2011). <i>Building a High-Quality Teaching Profession. Lessons from Around the World</i> . Paris, France: Organisation for Economic Co-operation and Development (OECD).	Top-performing and rapidly-improving countries in 2009 PISA	Belgium, Brazil, Canada, China, Denmark, Estonia, Finland, Hong Kong (China), Japan, the Netherlands, Norway, Poland, Singapore, Slovenia, the United Kingdom and the United States	Review of previous analyses and data from TALIS 2011	<ol style="list-style-type: none"> 1. Making teaching an attractive career choice 2. Ensuring high-quality teacher preparation 3. Meeting teachers' needs for professional development 4. Fostering an environment for teacher collaboration 5. Establishing effective employment conditions 6. Providing for attractive careers 7. Making teacher appraisal systems effective 8. Maximizing the impact of teacher appraisal 9. Designing effective compensation systems 10. Achieving educational reform that works 11. Securing a strategic relationship between governments and unions

<p>Schmidt, W. et al. (2007). <i>The Preparation Gap: Teacher Education for Middle School Mathematics in Six Countries</i>. Ann Arbor, MI: MSU Center for Research in Mathematics and Science Education.</p>	<p>Volunteer participation</p>	<p>Bulgaria, Germany, Korea, Mexico, Taipei (China) and the United States</p>	<p>Survey of teachers</p>	<ol style="list-style-type: none"> 1. Taiwanese and Korean future teachers are the top performers in all five assessed areas of mathematical knowledge 2. These teachers also reported taking courses that covered a greater share of the advanced mathematical topics typically covered in undergraduate math programs
<p>Tucker, M. S. (2011). "Standing on the Shoulders of Giants. An American Agenda for Education Reform." Washington, DC: National Center for Education and the Economy.</p>	<ol style="list-style-type: none"> 1. Student achievement at the top is world class (quality) 2. Lowest-performing students do not lag far behind top-performing students (equity) 3. System produces results at low cost (productivity) 	<p>Finland, Japan, Ontario (Canada), Shanghai (China), Singapore</p>	<p>Review of analyses and interviews with policy-makers</p>	<ol style="list-style-type: none"> 1. Raising standards for entry into teacher education 2. Moving teacher education into major research universities 3. Insisting that teachers of all subjects have a depth and breadth of mastery of the subjects they will teach that is comparable to those with bachelors 4. Making sure prospective teachers have excellent skills in diagnosing student problems and prescribing appropriate solutions 5. Designing teacher preparation on a clinical model 6. Raising the criteria for teacher licensure and never waiving the licensure standards in the face of shortages 7. Making sure compensation for beginning teachers is and remains comparable to those of non-feminized professions and adding the amounts necessary to get teachers to work in hardship locations 8. Providing an induction period for new teachers of at least a year 9. Constructing multiple career paths for teachers (including school administration) that are merit-based and that imply increasing responsibility and compensation 10. Identifying teachers with administration potential, grooming them for advancement and supporting them so long as they continue to show potential for advancement

Source: Author's elaboration.

Table A.2: Key Information on International and Regional Student Achievement Tests

Databases					
Year	Abbreviation	Skill	Countries	Age of Students	Grade Tested
1964	IEA-FIMS	Math	12	13, FS	8, 12
1970-72	IEA-SRC	Reading	15	10, 14, FS	4, 8, 12
1982-83	IEA-FISS	Science	19	10, 14, FS	4, 8, 12
1984	IEA-SIMS	Math	19	13, FS	7, 12
1988	IEA-SISS	Science	23	10, 14, FS	4, 8, 12
1991	IAEP	Math, Science	6	13	7
1990/91	IEA-TIMSS	Reading	32	9, 14	5, 8
1993-98	IAEP	Math, Science	19	9, 13	5, 8
1992-97	IEA-TIMSS	Math, Science	45	9, 13, FS	3, 4, 7, 8, 12
1997	UNESCO-MLA	Math, Science, Reading	72	9, 10, 13	3, 4, 7
1999	UNESCO-LLECE	Math, Reading	11	9, 10	3, 4
1999	UNESCO-SACMEQ	Reading	7	10	6
1995-2009	IEA-TIMSS	Math, Science	38	14	8
2000	CONFENMEN-PASEC	Math, Reading	13	7, 8, 9, 10	2, 5
2001	OECD-PISA	Math, Science, Reading	43	15	7, 8, 9
2002	IEA-PIRLS	Reading	35	9, 10	4
2003	UNESCO-SACMEQ	Math, Reading	14	10	6

Databases					
Year	Abbreviation	Skill	Countries	Age of Students	Grade Tested
2003	IEA-TIMSS	Math, Science	26, 48	10, 14	4, 8
2003	OECD-PISA	Math, Science, Reading	41	15	7, 8, 9
2006	IEA-PIRLS	Reading	41	9, 10	4
2006	OECD-PISA	Math, Science, Reading	57	15	7, 8, 9
2006	UNESCO-SERCE	Math, Science, Reading	17 or 6 for Science	8, 11	3, 4, 6
2007	IEA-TIMSS	Math, Science	66	10, 14	4, 8

Source: Altinok, N., Diebolt, C. & De Meuleester, J.-L. (2010). "International Database on Human Capital Quality: An Update." Mimeo. Bourgogne, France.

Table A.3: Top 10 Education Systems in the Historical Measure of Educational Quality

Education System	Primary	Secondary	General
South Korea	66.94	66.12	65.52
Japan	63.98	66.10	63.95
Finland	64.80	62.32	62.34
Taipei (China)	63.26	63.81	62.29
Singapore	62.55	63.45	61.69
Hungary	61.60	62.77	60.79
Belgium (Fl.)	62.69	60.57	60.20
Hong Kong (China)	61.75	61.45	60.16
Netherlands	61.12	61.47	59.81
Canada	60.49	61.22	59.31

Source: Altinok, N., Diebolt, C. & De Meuleester, J.-L. (2010). "International Database on Human Capital Quality: An Update." Mimeo. Bourgogne, France.

Table A.4: Top 10 Education Systems in Long-Term Improvements (1970-2007)

Education System	Improvement in Score	Percentage Improvement	Average Annual Improvement
Chile	19.51	67%	1.91
Iran	14.87	49%	1.49
Luxembourg	16.06	43%	1.35
Hong Kong (China)	13.58	31%	0.99
Canada	10.40	22%	0.75
Finland	5.24	10%	0.37
Israel	4.60	10%	0.34
New Zealand	3.05	6%	0.20
Sweden	1.98	4%	0.14
United States	1.98	4%	0.14

Source: Altinok, N., Diebolt, C. & De Meuleester, J.-L. (2010). "International Database on Human Capital Quality: An Update." Mimeo. Bourgogne, France.

Note: Long-term improvements refer only to secondary schools quality.

Table A.5: Top 10 Education Systems in Short-Term Improvements (1995-2007)

Education System	Score	Improvement in Score
Ghana	24.36	3.63
Armenia	51.30	1.86
Chile	41.98	1.18
Lebanon	44.65	1.11
Luxembourg	56.61	0.89
Mexico	44.55	0.86
Indonesia	41.62	0.75
Poland	57.11	0.71
Germany	57.77	0.60
Finland	62.34	0.56

Source: Altinok, N., Diebolt, C. & De Meuleester, J.-L. (2010). "International Database on Human Capital Quality: An Update." Mimeo. Bourgogne, France.

Note: Short-term improvements refer to both primary and secondary schools quality.