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Overview: Teacher Policies Matter

This chapter defines teacher policies and the scope of this report. It then presents the main findings about the variation and effectiveness of teacher policies based on analyses of data from the Programme for International Student Assessment (PISA) and related databases. It concludes by outlining the implications for education policy and practice.

Note regarding B-S-J-G (China)
B-S-J-G (China) refers to the four PISA participating China provinces : Beijing, Shanghai, Jiangsu, Guangdong.

Note regarding CABA (Argentina)
CABA (Argentina) refers to the Ciudad Autónoma de Buenos Aires, Argentina.

Note regarding FYROM
FYROM refers to the Former Yugoslav Republic of Macedonia.

A note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

The quality of an education system depends on the quality of its teachers; but the quality of teachers cannot exceed the quality of the policies that shape their work environment in school and that guide their selection, recruitment and development.[1]

Analyses in this report use students' performance in assessments of science, reading and mathematics, and students' reports about the school climate, to indicate the capacity of schools and school systems to deliver excellent, equitable and inclusive education. While excellence, equity and inclusion are the effects of many causes, good teacher policies are the foundations on which successful school systems are built. Examples of effective teacher policies can therefore be found by analysing how the most successful schools and systems select, recruit and develop their teachers. The report builds on the analytical framework for teacher policies, developed in the publication, *Teachers Matter* (OECD, 2005[1]), and updated subsequently, and refers to the comparative data and indicators on teacher policies, teacher characteristics, and teacher working conditions produced by three OECD programmes: the Indicators of Education Systems (INES) programme, the Teaching and Learning International Survey (TALIS) and the Programme for International Student Assessment (PISA).[2]

Most of the analyses in this report are correlational in nature, and cannot provide definitive evidence that certain policies or practices have a specific effect, either when implemented in concert or individually. While this limitation is explicitly acknowledged in each chapter, establishing such associations can nevertheless help verify – and dispel – certain myths about teachers and performance in PISA.[3] The association of a particular policy with a specific outcome constitutes one piece of evidence among many (and particularly in conjunction with research evidence from national contexts) to reduce the uncertainty around the merits of this policy. Not all findings in this report suffer equally from this limitation, however. Discussions related to inequalities in teacher resources between schools (see Chapter 3) constitute the most ambitious effort to date to map these disparities by using internationally comparable indicators.

WHAT ARE TEACHER POLICIES?

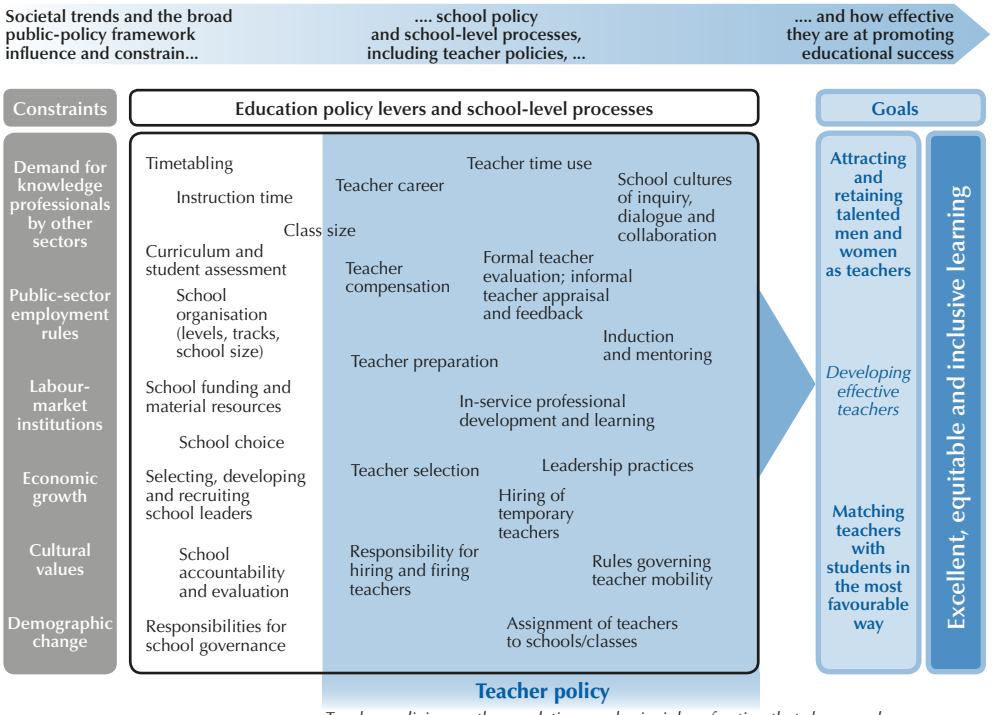
Broadly defined, teacher policies are the regulations and principles of action at the levels of schools and education systems that shape, in a particular time and place, the teaching force and what teachers do. Existing definitions of "teacher policies" comprise several common elements. The *Teachers Matter* report (OECD, 2005[1]), for example, covers policies related to "attracting, recruiting, developing and retaining effective teachers". The same report further classifies these policies into five main clusters: policies related to the preparation and development of teachers (what does it take to become a teacher?); policies related to career structure and incentives (what motivates individuals to work as teachers?); policies that influence the demand for teachers (such as class size, teaching loads, timetabling, etc.); policies that govern and structure the labour market (how are teachers matched to vacancies?); and school processes and practices that influence the work of teachers. These policies are embedded within the larger school policies and societal contexts. Similarly, the term "teacher-related policies" covers the processes of "recruitment, assignment, compensation, evaluation, promotion and retention" of teachers in the review article by Jackson, Rockoff and Staiger (2014[2])

A more recent publication, *Empowered Educators* (Darling-Hammond et al., 2017[3]) emphasises school processes and peer relationships to a larger extent, and identifies the following areas as

having a direct influence on teachers and their work: recruitment (including selection) processes and regulations, teacher preparation, induction and mentoring, professional learning, teacher feedback and appraisal, and career and leadership development. More indirectly, school policies, such as school curricula, assessments and accountability, school-funding strategies, and school organisation and scheduling, also influence and constrain the work of teachers.[4]

Figure 1.1 highlights the main elements of the conceptual framework for this report. This framework views education policy as embedded in a particular society and constrained by the wider institutional and cultural environment of a particular place and time. By setting rules for the school system and guiding the actions of local decision-makers, education policy makers aim to promote excellent, equitable and inclusive learning. Their success in achieving this ultimate goal depends on the policies they choose, and also on how particular policies interact with each other and with the wider environment in which they are applied.

Figure 1.1 ■ **Conceptual framework for analysing teacher policy**



Teacher policies are the regulations and principles of action that shape and constrain who teachers are and what teachers do, through their direct influence on teacher selection, development and allocation.

Notes: The figure presents the main constraints, levers and goals of teacher policy, as defined in this report.
Countries' and schools' success in attaining the goals of teacher policy, and of education policy more generally, is measured through PISA assessments and PISA student, school or teacher questionnaires; the goal of "developing effective teachers" is indicated in italics because no measure of teacher effectiveness is developed in this report.
For further details, please refer to the text.

More specifically, teacher policy is concerned with three intermediate goals: attracting talented men and women to teaching, and retaining them; developing effective teachers; and matching teachers with students in the most favourable way (given the ultimate goal of promoting excellent, equitable and inclusive learning). To study teacher policies means analysing those education policies and school-level practices that most directly relate to these three goals, while acknowledging that these policies and practices are influenced by and interact with a broader set of school policies to produce their results. The regulations and principles of action enumerated in Figure 1.1 constitute, in reality, integrated systems or policy environments, with strong inter-dependencies not only among teacher policies, but also between teacher policy and other areas of school policy, as well as between education policy and the constraints set by the public-policy framework or by societal trends.

This report describes how the rules and actions that govern the aspects highlighted in blue in Figure 1.1, and referred to as "teacher policies", differ across schools and education systems. It then analyses how this variation is related to the capacity of schools and education systems to nurture excellence, equity and inclusiveness, as indicated by student outcomes in PISA, and to two more immediate goals of teacher policy, namely attracting talented men and women to the teaching profession, and matching teachers and students in the most favourable way. The three remaining chapters in this report discuss key goals of teacher policy and of education policy more broadly: nurturing excellent and inclusive learning; ensuring fair and equitable access to education for all; and renewing the teaching profession to ensure its long-term sustainability.

Not all areas that define a system's "teacher policy" and influence the quality of teachers and teaching are covered in the same detail in this report. The attention given to particular aspects often depends on the availability of data in PISA and in other related databases; and inevitably, the emphasis in this report is on those levels of education in which 15-year-olds are enrolled. For a relatively large set of policies, system-level data are available, and can be related to the variation among countries in student outcomes.[5] For a more restricted set of aspects, PISA questionnaires are used to determine their immediate effects on school and teacher characteristics (e.g. the qualification level of teachers, as a measure of initial teacher education). In these cases, and if deemed appropriate, the within-country variation in teacher characteristics and policies, and how it relates to the variation in student composition and student outcomes, is also analysed.

Some areas of teacher policies and of wider education policies with which teacher policies closely interact receive only scant, if any, coverage in this report. The most important omissions are related to rules and principles of action governing teachers' use of time; to the career structure for teaching professionals, which is largely unique to every country and education system; and to school cultures, knowledge flows, and personal relationships that characterise the organisation of schools.[6]

Among teacher policies, school autonomy in hiring, compensating and firing teachers is particularly emphasised in this report. Greater school autonomy increases recruitment and management costs, making it harder to provide consistent service. For this reason, granting schools greater responsibility for hiring teachers could lead to greater disparities in teachers' qualifications and experience among schools (OECD, 2005, p. 12[1]). Managing these risks requires greater care in selecting and training principals and other school leaders, and providing schools in unpopular locations with significantly more resources to remain attractive. More centralised systems, on the other hand,

might find it more difficult to adapt to the diverse and rapidly changing situations in which schools operate. When teacher allocation and promotion is governed by impersonal rules, those rules might result in suboptimal matches between teachers' talents and preferences on the one hand and the needs of schools and students on the other. Many systems combine multiple levels of governance precisely in order to avoid the dangers of both excessive fragmentation and centralisation.

School autonomy in hiring, compensating and firing teachers is often constrained by the broader policy framework and by labour-market institutions, including, for example, unions. In most countries, schooling is principally a public-sector activity. Central or local governments either directly run schools or they provide much of the funding that other organisations use for their schools. As a consequence, in most countries, teachers' employment and the level of responsibility that schools have for hiring and firing teachers is fundamentally shaped by wider public-sector employment policies and practices. Most teachers are either civil servants or are employed under conditions similar to those in the civil service.

There are two basic models of public-sector employment: "career-based" and "position-based" (OECD, 2005[1]; OECD, 2004[4]).

The predominant model for teacher employment in OECD countries is "career-based" public service in which entry is competitive, career development is extensively regulated and lifetime employment is largely guaranteed. Because teachers cannot easily be removed for unsatisfactory performance, the quality of teachers depends mainly on setting high standards for entering teacher-preparation programmes and for the quality of initial preparation, and on the attention given to the quality of teachers' preparation in selection and recruitment processes. This is the prevalent model in France, Italy, Japan and Korea, for example.

By contrast, some countries have "position-based" public service. In these countries, which include Canada, Sweden, Switzerland and the United Kingdom, public servants are required to apply for specific positions by showing that their competencies match specific job requirements. While this can increase recruitment and management costs, and make it harder to provide consistent service, it is often associated with a more flexible labour market for teachers, with multiple points of entry and greater roles for teacher appraisal and in-service training as levers for teacher improvement.

Many countries blend elements of career-based and position-based employment. For example, some countries with career-based public employment have increased the level of school involvement in selecting teachers or in matching teachers to vacancies, or they have introduced performance-management schemes and devolved the responsibility for them to school leaders. More radical reforms of public-sector employment are rare, however, and often encounter significant resistance.

OVERVIEW OF MAIN FINDINGS

Are there qualities unique to teachers in high-performing countries and schools?

Three elements of teachers' professional-development policies are common to high-performing countries:[7] a mandatory and extended period of clinical practice as part of initial teacher education or of the induction period; the presence of a variety of bespoke opportunities for

in-service teachers' professional development, such as workshops organised by the school; and teacher-appraisal mechanisms, either legislated or deeply rooted in school practice, with a strong focus on teachers' continuous improvement. But the shared goal of supporting teachers' professionalism throughout their career translates into many different approaches to selecting and evaluating teachers, and a wide range of career and compensation structures. Both career-based and position-based public employment traditions are found among high-performing systems.

PISA results also show a positive relationship between increases in schools' responsibility for selecting teachers for hire between 2006 and 2015 and contemporaneous improvements in students' performance in science, reading and mathematics. Furthermore, this relationship is stronger across systems in which school-level achievement data are used for accountability practices – e.g. are posted publicly or are tracked over time by an administrative authority. This might suggest that when greater responsibility for teacher selection is devolved to schools, systems are better able to adapt to new circumstances and to growing expectations, and teachers are more committed to students' learning – provided that schools have the right incentives and are held accountable for their outcomes. However, the relationship could also reflect countries' decision to reduce school autonomy if student performance is in decline, or to grant greater autonomy to schools if performance is improving. In other words, the causal direction of this association cannot be determined.

An analysis comparing schools within countries also shows that school performance and student behaviour are positively related to teachers' average years of experience, while teacher turnover rates are negatively related to performance and behaviour, after accounting for differences in students' and teachers' demographic characteristics across schools.

Can teacher sorting compensate for student disadvantage?

Analyses show that a majority of countries and economies that participated in PISA 2015 try to compensate for disadvantage in schools with smaller classes and/or lower student-teacher ratios. However, in more than a third of countries and economies, including many that compensate for disadvantage in schools by allocating more teachers to those schools, teachers in the most disadvantaged schools are less qualified and/or experienced than those in the most advantaged schools (Figure 1.2).

Several countries with career-based teacher employment, including France and Italy, allocate more teachers to disadvantaged schools, but do not provide these schools with the instruments and flexibility required to attract and retain more qualified or experienced teachers in the most challenging classrooms. Sometimes, the very policies that channel more resources to high-need schools might, in fact, deter more-experienced teachers from teaching in these schools. Where centrally set rules for promotion and mobility of teachers privilege teacher preferences and give priority to more senior teachers, and where teachers' pay does not vary greatly across schools or across teachers with similar experience and qualifications, it appears difficult to avoid attracting a high concentration of the most experienced teachers in the most prestigious schools. The Japanese and Korean "career-based" systems appear more successful at compensating schools for student disadvantage, perhaps because they temper seniority-based priority rules with mandatory requirements for teacher mobility and career incentives for teachers who work in high-need schools (Box 1.1).

Figure 1.2 [1/2] ■ How does the quality and quantity of teachers differ between advantaged and disadvantaged schools?

Results based on principals' reports

dd | aa Disadvantaged schools (mean: dd) are **better off** compared to advantaged schools (mean: aa)

dd | aa Disadvantaged schools (mean: dd) are **worse off** compared to advantaged schools (mean: aa)

mm Difference not significant (the overall mean, mm, is reported)

Missing values

	All schools				Public schools and government-dependent private schools			
OECD	Class size (number of students)	Number of students per teacher	Proportion of science teachers with a major in science (%)	Proportion of fully certified teachers (%)	Class size (number of students)	Number of students per teacher	Proportion of science teachers with a major in science (%)	Proportion of fully certified teachers (%)
Australia	25	13 | 12	91 | 96	96	25	13	92	96
Austria	24	10	40 | 84	89	24	10	39 | 87	88
Belgium	17 | 23	7 | 10	48	82 | 95	18 | 23	7 | 11	38 | 57	84
Canada	24 | 28	13 | 15	78	97	24 | 28	13 | 16	77	97
Chile*	34	18	72	25	35	16 | 21	70	23
Czech Republic	21 | 27	13	56 | 71	91 | 96	21 | 27	13	57 | 71	91 | 96
Denmark	22	11 | 13	86		22	11 | 14	85	
Estonia	20 | 30	8 | 12	71	94	19 | 29	8 | 12	70	94
Finland	18 | 20	10	83	93	18 | 20	10	83	93
France	25 | 33	9 | 12	87	19 | 90	25 | 33	9 | 12	87	20 | 92
Germany	22 | 28	14	79	91	22 | 27	14	75 | 90	92
Greece	24	8	44	91	24	7 | 10	42	90
Hungary	26 | 31	6 | 10	75		26 | 32	6 | 9	74	
Iceland	17 | 22	9	20 | 35	82 | 91	17 | 22	9	20 | 36	82 | 92
Ireland	25	12 | 14	93	99	24	12 | 14	92	100
Israel	28 | 33	10	83	79				
Italy	23	8 | 13		83 | 95	23	8 | 13		83 | 97
Japan	33 | 38	9		96	32 | 38	9		96
Korea	29 | 32	13 | 15	90	96	31	13 | 15	92	96
Latvia	17 | 24	7 | 11	79	65	17 | 25	7 | 11	80	66
Luxembourg	21 | 23	9 | 11	63 | 81	64 | 88	20 | 23	9 | 11	63 | 79	64 | 85
Mexico	34 | 40	20	53 | 78	57 | 33	33 | 44	17 | 27	53 | 79	58 | 23
Netherlands	22 | 27	13 | 20	23 | 51	75 | 94	22 | 27	14 | 20	23 | 50	75 | 94
New Zealand	25	14	93	92	26	12 | 15	92	92
Norway	22 | 26	9 | 11	40 | 70	88	22 | 27	9 | 11	42 | 70	88
Poland	22 | 26	8	92	99	22 | 26	8	93	99
Portugal	24 | 27	10 | 12	87	92 | 98	24 | 28	10 | 11	86	96
Slovak Republic	19 | 25	12	62	89 | 96	19 | 25	12	62	89 | 96
Slovenia	25 | 28	9	82 | 88	97	25 | 28	9	82 | 88	97
Spain	27	11 | 15	82	93	27	11 | 15	82	93
Sweden	22 | 25	11	79	89	22 | 25	11	79	89
Switzerland	20	11	46 | 91	86	20	12	46 | 92	87
Turkey	48	14	78	90	48	14	79	92
United Kingdom	24	14	92 | 99	92	23 | 26	13 | 16	92 | 98	96
United States	26	14	96 | 80	92	26	14 | 17	94	94 | 99
*- Massachusetts***					22	11	97	94 | 100
*- North Carolina***					25 | 30	15	97	98

Notes: Differences in class size of less than two students and of student-teacher ratios of less than one student are not reported as significant; differences in proportions of science teachers with a major in science and of fully certified teachers of less than four percentage points are not reported as significant. Larger differences are reported as significant based on the estimated standard errors.

*In Chile the question about the certification of teachers was adapted as "authorised or enabled by the Ministry of Education".

**Massachusetts and North Carolina participated in PISA 2015 with state-level samples representing public schools only.

Countries and economies are ranked by OECD/partner status and in alphabetical order.

Source: OECD PISA 2015 Database, Tables 3.1, 3.2, 3.3, 3.4, 3.11, 3.12, 3.13 and 3.14.

StatLink http://dx.doi.org/10.1787/888933740155

Figure 1.2 [2/2] ■ How does the quality and quantity of teachers differ between advantaged and disadvantaged schools?

Results based on principals' reports

dd | aa Disadvantaged schools (mean: dd) are **better off** compared to advantaged schools (mean: aa)
dd | aa Disadvantaged schools (mean: dd) are **worse off** compared to advantaged schools (mean: aa)
mm Difference not significant (the overall mean, mm, is reported)
Missing values

	All schools				Public schools and government-dependent private schools			
Partners	Class size (number of students)	Number of students per teacher	Proportion of science teachers with a major in science (%)	Proportion of fully certified teachers (%)	Class size (number of students)	Number of students per teacher	Proportion of science teachers with a major in science (%)	Proportion of fully certified teachers (%)
Albania	27	7	72	84	28	8	70	84
Algeria	30	17	36	91	29	17	36	91
Brazil	37	22	21 | 39	87	37	22	29	89
B-S-J-G (China)	46	13	65 | 90	98	47 | 43	12	71 | 98	98
Bulgaria	25	12	94 | 100	97	24 | 27	11 | 14	94 | 100	98
CABA (Argentina)	40	8	18 | 51	89	40	7	32	92
Colombia	30 | 35	24 | 20	80	11	30 | 40	27	84	8
Costa Rica	28	17	93 | 100	90	28	17	97	93
Croatia	24 | 27	10 | 12	89	95	24 | 27	10 | 12	89	95
Dominican Republic	36	19	67		38	19	76	
FYROM	26	12	76 | 84	78	26	12	76 | 83	70 | 75
Georgia	31 | 43	9 | 13	77	18 | 38	31 | 45	9 | 18	76	19 | 44
Hong Kong (China)	31	12 | 14	89	95	31	12 | 14	89	95
Indonesia	27 | 35	12	72 | 88	40 | 82	26 | 33	12	82	41 | 89
Jordan	33	14	82	71	28 | 36	13	84	75
Kosovo	25 | 31	15	100 | 67	73	25 | 32	15	100 | 53	75
Lebanon	27	10	71	69	27	7 | 10	58 | 100	77
Lithuania	20 | 27	8 | 12	93	99	20 | 27	8 | 12	93	99
Macao (China)	35 | 37	13	88 | 94	100	35	14	88 | 98	100
Malta	17 | 22	5 | 9	39 | 79	96 | 83	17 | 22	5 | 8	39 | 93	96 | 70
Moldova	22 | 28	11 | 13	55	67 | 78	22 | 27	11 | 13	54	67 | 79
Montenegro	26 | 30	11 | 9	98	98	26 | 30	11 | 9	98	98
Peru	25 | 28	15	19	92 | 76	24 | 31	13 | 22	19	91
Qatar	34 | 26	12	28 | 35	45 | 60	29 | 32	7 | 9	6 | 27	100 | 72
Romania	23 | 29	14	84	92	23 | 29	15	84	93
Russia	18 | 26	8 | 14	89 | 97	98	18 | 26	8 | 14	89 | 97	98
Singapore	34 | 31	12	91 | 95	91	35	12	92	99 | 91
Chinese Taipei	36 | 39	14 | 18	94	86 | 94	34	14	94	89 | 95
Thailand	33 | 43	18	90	94	33 | 43	16 | 20	91	94
Trinidad and Tobago	25 | 34	10 | 15	80	38 | 64	25 | 35	10 | 14	83 | 78	39 | 63
Tunisia	28	10	79	92	28	10	77	91
United Arab Emirates	33 | 26	15 | 13	90	27 | 18	32	10	97 | 82	50
Uruguay	27	12	6	54 | 63	24 | 30	12	5	56
Viet Nam	41	15	89	86	42	15	89	86
Education systems where disadvantaged schools are better off	38	24	2	4	40	34	3	4
Education systems with no difference	28	41	42	46	29	35	45	48
Education systems where advantaged schools are worse off	3	4	23	16	1	1	20	15

Notes: Differences in class size of less than two students and of student-teacher ratios of less than one student are not reported as significant; differences in proportions of science teachers with a major in science and of fully certified teachers of less than four percentage points are not reported as significant. Larger differences are reported as significant based on the estimated standard errors.

Countries and economies are ranked by OECD/partner status and in alphabetical order.

Source: OECD PISA 2015 Database, Tables 3.1, 3.2, 3.3, 3.4, 3.11, 3.12, 3.13 and 3.14.

StatLink http://dx.doi.org/10.1787/888933740155

Meanwhile, countries with more de-centralised or position-based systems to match teachers to vacancies might also end up with fewer qualified teachers in the most disadvantaged schools (as is observed in Switzerland and the United Kingdom, as well as among public and government-dependent schools in the United States), often with no compensatory improvement in teacher quantity. In Australia, disadvantaged schools even have fewer teachers than the most advantaged schools do, although the latter are often private, independent schools. Overall, however, higher levels of school autonomy for managing teachers are associated with a more equitable sorting of teachers across schools. This implies that many countries are successful at combining the flexibility that comes from greater school autonomy with compensatory funding mechanisms, thereby enabling the most challenging schools to attract the best teachers. Finland, Hong Kong (China) and Ireland (Box 1.2), for example, combine high levels of school responsibility in selecting teachers for hire (and, in the case of Hong Kong [China], in setting their salaries) with compensatory teacher sorting, whereby more, and at least equally qualified teachers, are found in the most disadvantaged schools.

While all countries have disparities in student performance related to socio-economic status, countries in which teachers' qualifications and experience are significantly better in advantaged schools than in disadvantaged schools tend to have larger performance gaps related to students' socio-economic status and therefore less equitable outcomes. In contrast, countries that compensate for disadvantage in schools with smaller classes and student-teacher ratios do not have, on average, narrower performance gaps related to socio-economic status, perhaps because such quantitative compensations do not translate into better quality of teachers and teaching. This suggests that it is not sufficient, and perhaps not necessary, for the most challenging schools to have more teachers, provided these schools are able to attract the most talented and effective teachers.

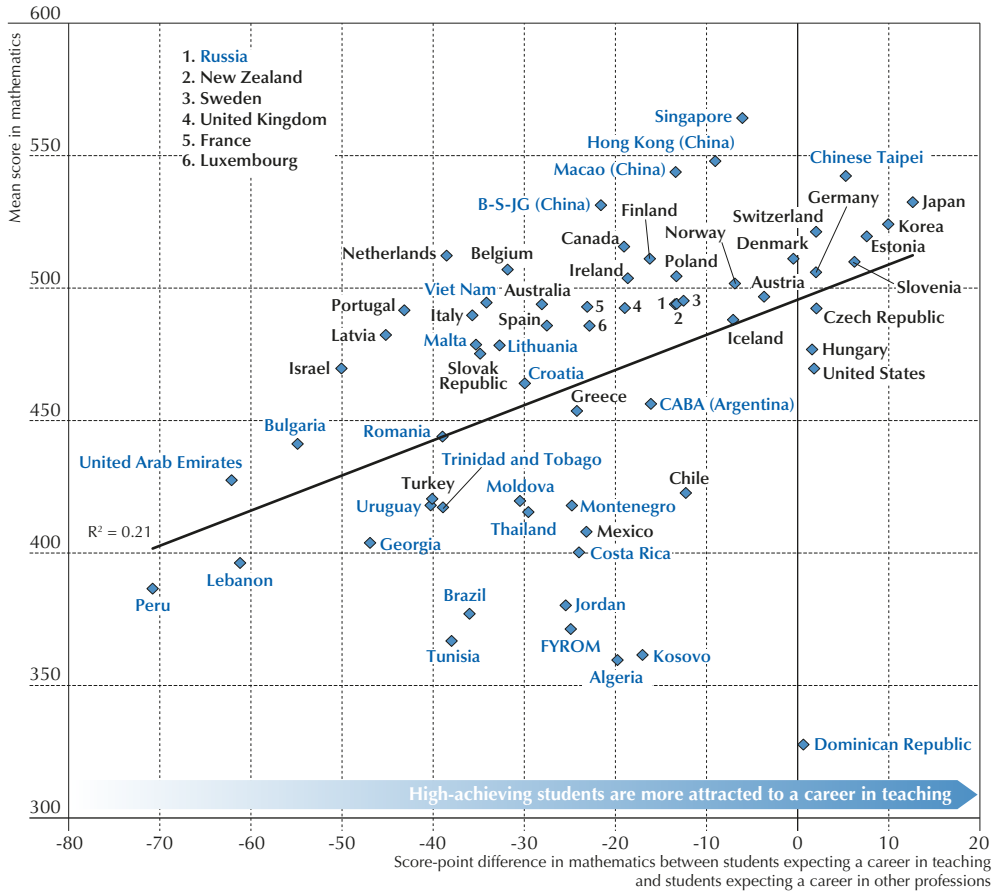
Who wants to have a career in teaching?

Between 2006 and 2015, there has been a marginal decline in 15-year-old students' expectation to pursue a career in teaching. In PISA 2006, about 5% of 15-year-old students expected to be working as teachers when they are 30, while in PISA 2015 about 4.2% of students expected so. Despite this decline, in most countries, the share of 15-year-olds who expect to become teachers remains larger than the share of working-age adults who are teachers today. Considering these responses, concerns about a lack of candidates for a career in teaching are therefore exaggerated (except in a few countries). In fact, the teaching profession enjoys a clear advantage over other occupations that 15-year-olds might not even know exist: all 15-year-olds have had some contact with teachers and have at least an approximate idea of what they do and of their working conditions.

However, the profile of students who see themselves as teachers later on is, in most countries, very much like the stereotypical teacher today. In PISA 2015, boys and immigrant students in particular were less likely than girls and students without an immigrant background to expect to work as teachers, even after accounting for differences in socio-economic status and academic performance. This pattern might reflect the strength of gender stereotypes related to occupations (is this occupation good for someone like me?) and the importance of personal contacts and role models when teenagers are considering their career choices.

Furthermore, while the Survey of Adult Skills, a product of the OECD Programme for the International Assessment of Adult Competencies (PIAAC), shows that, in most countries, the literacy and numeracy skills of teachers are on par with those of other college graduates (Hanushek, Piopiunik and Wiederhold, 2014[5]), in many countries, 15-year-old students who in 2015 expected to be working as a teacher when they are 30 had poorer mathematics and reading skills than students who expected to be working in other professions that, like teaching, require at least a university degree. And the skills gap between students who expected a career in teaching and students who expected a career as professionals tended to be larger in low-performing countries than in top-performing countries (Figure 1.3). This echoes long-held concerns about the composition of the teaching workforce: in many countries, fewer high achievers and fewer men choose to become, or to remain, teachers (OECD, 2005[1]).

Figure 1.3 ■ **In which countries are high-achieving students attracted to teaching?**



Source: OECD PISA 2015 Database, Table 4.3; OECD (2016), *PISA 2015 Results (Volume I): Excellence and Equity in Education*, Table I.5.3, http://dx.doi.org/10.1787/888933433203.

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Surveys of teachers often show that teachers are highly motivated by the intrinsic benefits of teaching: working with children, helping them develop and making a contribution to society. The *Teachers Matter* report, for example, summarises findings from French and Australian surveys, and the opinions of several national experts participating in country reviews, to conclude that extrinsic factors, such as job stability, pay or working hours, are of secondary importance for those who elected a career in teaching and remained in the profession (OECD, 2005, pp. 67-69[1]). While intrinsic factors are no doubt important for current teachers, these studies do not explain why other "potential teachers" elected alternative careers instead of teaching, or quit teaching after a while. In fact, studies that survey a larger pool of graduates about their career choices show that the relative salaries of graduate occupations do play a role in these choices: had teachers' salaries been higher, more "potential teachers" would have seriously considered a career in teaching.

Results of analyses that consider, simultaneously, country-, school-, and student-level factors associated with career expectations indicate that countries with higher teachers' salaries (relative to GDP) tend to have larger shares of students who expect to work as teachers. A weaker positive association is found with the proportion of teachers who reported, in TALIS, that the teaching profession is valued in their society. Furthermore, while in all countries girls were more likely to expect a career in teaching than boys, students' expectations of a teaching career were more gender-balanced in countries with higher teachers' salaries. Boys, in other words, appear more sensitive than girls to differences in teachers' salaries. However, there is no evidence that higher salaries attract high-achieving students into the teaching profession more than low-achieving students.

Another set of analyses considers comparisons over time within countries. These analyses reveal that in countries where teachers' salaries increased more rapidly than per capita GDP between 2005 and 2015, there was often an increase in the percentage of students who reported expecting a career in teaching; while in countries where teachers' salaries did not keep up with overall GDP growth – as in Turkey and Korea – this percentage decreased, on average. However, the relative performance of students who expected to work as teachers declined the most in countries where teachers' salaries increased more rapidly than GDP growth, on average. While this does not necessarily reflect a causal relationship, it suggests, like the previous result, that low-achieving students might be as much, and perhaps more, sensitive to variations in salaries compared to high-achieving students.

Both types of analyses therefore suggest that increases in teachers' salaries can improve the attractiveness of the teaching profession, but might not be enough to attract more high-achieving students to the profession. Extrinsic levers might only indirectly increase selectivity, for example if the increase in the supply of candidates for the teaching profession is met by a stable demand for teachers.

WHAT THESE RESULTS IMPLY FOR POLICY

A high-quality teaching force is the result of deliberate policy choices, carefully implemented over time

Teachers are the most significant resource in today's schools. In every country, teachers' salaries and teacher training represent the greatest share of expenditure in education (OECD, 2017[6]).

The investment in teachers can have significant returns: research increasingly documents how individual teachers, from kindergarten (Araujo et al., 2016[7]) to higher education (Carrell and West, 2010[8]; Braga, Paccagnella and Pellizzari, 2016[9]), make a difference in the learning and life outcomes of otherwise similar students (Rivkin, Hanushek and Kain, 2005[10]; Chetty, Friedman and Rockoff, 2014[11]). This implies that teachers are not interchangeable widgets in an industrial assembly line; individual teachers can change lives – and improve the quality of education that schools provide. Improving the effectiveness, efficiency and equity of schooling depends, in large measure, on ensuring that competent people want to work as teachers, that their teaching is of high quality and that all students have access to high-quality teaching.

It is true that the largest source of variation in student outcomes is attributable to differences in what students bring to school: their prior knowledge and skills, their attitudes, and their family and community background. But such factors are difficult for policy makers to influence, at least in the short term. Among the factors that influence student learning and are potentially open to policy influence, those involving teachers and teaching have the strongest influence. As a recent review of teacher policies in high-performing systems notes, "teaching is where the rubber hits the road […]. Teachers […] and the strategic moves they make […] are the primary mediators of learning" (Darling-Hammond et al., 2017[3]).

Policies that affect teachers and teaching are not only critical for delivering better results and lowering the costs of education. Today, the challenge of improving education is compounded by our rising expectations for what education systems should deliver. In a fast-changing world, we expect students to leave school not only with a (more) solid foundation in the subjects taught in school; we expect them to have the dispositions and skills of lifelong learners, the ability to think critically about complex issues, and the will to constantly adapt and grow as technology advances, and as political and ecological realities change. Delivering on these expectations is only possible if teachers themselves are high-level knowledge workers who constantly advance their own professional knowledge, and expand the repertoire of tools and practices of their profession. Schools and education systems must also have the capacity to adapt to changing conditions and meet new challenges.

The findings in this report show that, contrary to what is often assumed, high-performing systems do not enjoy a natural privilege simply due to a traditional respect for teachers; they have also built a high-quality teaching force as a result of deliberate policy choices, carefully implemented over time. The findings also show that there are multiple models from which other countries can derive inspiration. The fact that high performers are found on three continents and within both career- and position-based systems of public employment implies that incremental reforms, progressively implemented over time and within the constraints set by larger school policies and social contexts, can go a long way towards improving a system's capacity to select, develop and retain more effective teachers and ensure that the most talented teachers operate in the most challenging schools and classrooms.

For example, given the rapid changes in education, the potentially long careers that many teachers have, and the need for updating skills, teachers' professional development must be viewed in terms of lifelong learning, with initial teacher education conceived as providing the

foundation for ongoing learning, rather than producing ready-made professionals. When it comes to selecting and recruiting teachers, countries with position-based public employment traditions might more naturally emphasise aspects that make teachers effective in the classroom and in the diverse (but complementary) roles teachers can play within a team. But several countries with career-based public employment show that the job stability that teachers enjoy under these systems does not necessarily lead to professional stagnation and a lack of collaboration. They often have supplemented rules for teacher selection, mobility and promotion that bear little relation to what makes a teacher effective, with greater responsibility – and accountability – for schools in recruiting, developing and supporting teachers. As a result, schools and systems are better able to adapt. These countries have also ensured that initial teacher education not only provides sound basic training in subject-matter knowledge, pedagogy related to the subject and general pedagogical knowledge, but that it also develops the skills for reflective practice and research on the job.

Teachers must become lifelong learners and inquisitive professionals

All high-performing countries and economies in PISA foresee a mandatory and extended period of (school-based) clinical training as part of pre-service teacher training or of the induction period; guarantee the presence of a variety of bespoke opportunities for in-service teachers' professional development, such as workshops organised by the school; and have teacher-appraisal mechanisms, either legislated or deeply rooted in school practice, with a strong focus on teachers' continuous improvement.

It is clear that greater responsibilities for schools require more skilled leadership teams and stronger support, too. This shows that teacher policy cannot be changed one piece at a time; reform always requires a systemic approach that considers the complementarities among the various areas that shape the work of teachers.

Even when greater responsibilities for selecting and developing teachers are devolved to schools, central and regional authorities play a strong role in ensuring that teacher resources are distributed adequately and equitably among schools.

Opponents to school autonomy often voice concerns that greater independence of schools might lead to greater disparities in student performance and, perhaps more worryingly, to an education system that exacerbates, rather than ameliorates, existing economic and social inequities. However, PISA results suggest that this is not the most common result of greater school autonomy. In fact, many countries have been able to combine extensive autonomy of schools with strong incentives to ensure that schools prioritise student learning over other considerations, such as hiring friends or relatives, and with compensatory funding mechanisms to ensure that equity is not jeopardised. Ireland, for example, shows how school autonomy, in the presence of compensatory funding schemes, can produce equitable access to education opportunities for all (Box 1.2). With strong incentives to operate in the interest of students, and significant degrees of freedom to adapt teachers' working conditions and pay to reflect the difficulty of tasks and additional levels of responsibility, school leaders are probably best placed to attract the most talented teachers to the most challenging classrooms.

The unequal access of disadvantaged students to quality teachers and teaching is a real concern

PISA data show that inequities in access to quality teachers and teaching affect both countries with centralised traditions and countries with decentralised traditions of teacher selection and allocation; and that they are strongly related to inequities in learning outcomes between advantaged and disadvantaged students.

While many countries do compensate schools operating in more challenging environments by allocating additional teachers, few countries are successful at reducing inequities in student performance in this way. This might indicate that, in practice, current efforts are not sufficient to compensate for student disadvantage, or that any positive effects are undermined if policies that allocate more teachers to disadvantaged schools do not also address the issue of teacher quality. Indeed, in many countries, more-qualified and -experienced teachers are less often found in disadvantaged schools; and the more pervasive this situation, the larger the difference in student performance related to socio-economic status in the country.

These results imply that most countries could do more to monitor how teachers are allocated to schools: the number of teachers, but also their qualifications, experience and effectiveness. Any teacher policy that aims to tackle student disadvantage should strive to allocate quality teachers, and not just more teachers, to underserved students.

In response to disparities in teacher quality between advantaged and disadvantaged schools, or between rural and urban schools, countries with decentralised systems of teacher management might need to strengthen the reallocation of school funding and possibly assign the best school leaders to the most challenging schools.

Countries with more centralised systems of teacher selection and recruitment should, in turn, consider increasing the level of school responsibility in these processes. School leaders' capacity to manage human resources cannot be created overnight, however. A gradual approach that initially provides schools with the possibility of creating a limited set of highly attractive project positions for experienced teachers, and of creating stronger and more coherent teams, as has recently been proposed in France (Cour des Comptes, 2017[12]), might be an effective response to this concern.

Targeted financial incentives for teachers – salary increases and other types of financial additional payments – are also often cited as necessary to compensate for unattractive working conditions in particular schools. However, studies that have evaluated such schemes have found positive effects in North Carolina (United States) (Clotfelter et al., 2008[13]) but not in France (Bénabou, Kramarz and Prost, 2009[14]; Prost, 2013[15]). Similar incentives might work differently, depending on the general framework for teacher employment and career progression, and on the size of the incentive.

Alternatively, in response to inequitable teacher sorting, countries with strong centralised traditions of teacher management could consider creating a mobility requirement, such as exists in Japan and Korea, for example (Box 1.1). This requirement should not lead to shorter job assignments, however, as excessive turnover – a problem found more frequently in the most disadvantaged schools – can have adverse effects on teacher collaboration and student performance. Too limited

mobility of teachers between schools, at the same time, can hinder the spread of new ideas and approaches. By introducing a requirement for teacher mobility (e.g. every 5 to 7 years), countries might stimulate continuous professional growth while also ensuring that effective teachers are fairly distributed across schools.

In addition to limiting the inequitable sorting of teachers across schools, many education systems can also do more to address the needs of all teachers, particularly novice teachers, in disadvantaged schools. Much can be done during initial training and, later, through mentoring and bespoke professional development opportunities, to equip teachers with the skills needed to work in disadvantaged schools and with an understanding of the social contexts of those schools and their students. Indirectly, such support can also modify teacher preferences. Teachers typically enjoy helping children develop and making a contribution to society, and have no reason to shy away from the challenges of teaching disadvantaged students. But teachers are also more likely to want to work in disadvantaged schools if they feel they have support from principals, can collaborate with colleagues, and are provided with adequate resources to deal with the problems they face. School leaders who support and empower teachers can not only attract more and better-qualified teachers to work in disadvantaged schools, they also have a positive impact on the school climate more generally. Student behaviour is indeed better in schools whose principals are perceived as transformational leaders.

Overall, this report underlines the benefits of measures to strengthen teacher professionalism and school leadership, and of enhancing information flows throughout the system. These measures can also help countries build self-adjusting systems with feedback at all levels, incentives to react, and tools to strengthen capacities and share expertise among teachers and administrators.

The attractiveness of the teaching profession is related to teachers' salaries; but to promote teaching as a career for top-performing students, job quality matters at least as much as pay

Many countries are trying to attract more people and people from more diverse backgrounds into teaching, not just to avoid shortages of teachers, but also to broaden the range of teachers' backgrounds and experiences, thereby increasing the system's capacity to handle student diversity.

People are attracted to certain professions by some combination of the occupational status, work environment, sense of personal contribution and the financial rewards associated with the given profession. Teacher policy needs to examine these aspects closely. The analyses in this report show that 15-year-old students are already sensitive to financial rewards when considering various occupations. However, the analyses also indicate that the relatively low salaries of teachers, compared with those of other professionals with similar education, are unlikely to be the sole reason it has proven difficult to attract high-achieving students, and students from under-represented backgrounds, to teaching.

School systems often aim to recruit their teachers from the same talent pool from which all of their top professionals are recruited. But people who see themselves as candidates for the professions, and are attracted to the working conditions enjoyed by professionals, might not find what they're looking for in schools that use bureaucratic management to direct teachers' work.

Transforming the work organisation of schools, involving teachers in school decision making, enhancing their leadership responsibilities and promoting teaching as a demanding but fulfilling profession are at least as important as increasing teachers' salaries. Media campaigns to enhance the image of the profession by highlighting its importance for the nation, its sophistication and complexity, and the intellectual excitement it can generate, can also help. Countries that wish to broaden the range of teachers' backgrounds and experiences could concentrate on promoting the benefits of a teaching career to groups who are under-represented in the teaching force, such as men and people from minority backgrounds.

Box 1.1 How Japan and Korea attract excellent teachers to disadvantaged schools

This report shows that socio-economically disadvantaged students in Japan and Korea are at least as likely as advantaged students to be taught by high-quality teachers, as measured by characteristics such as years of experience, being certified for all the subjects taught, and, for science teachers, having a university degree with a major in science.

In Japan, teachers are expected to periodically change schools throughout their career. This is intended to ensure that all schools have access to effective teachers and a balance of experienced and beginning teachers. The allocation of teachers to schools is decided by the local education authority, and the exact rules followed may differ.

In Korea, all teachers are held to high standards, which contributes to the country's high levels of performance and equitable distribution of teachers. Other elements contributing to the high calibre of the teaching force are the highly respected status of teachers, job stability, high pay, and positive working conditions, including high levels of teacher collaboration. A mandatory rotation scheme for teachers in Korea means that teachers are required to move to a different school every five years. Within this scheme, multiple incentives are offered to attract teachers to high-needs schools, including additional salary, smaller classes, less instructional time, additional credit towards future promotion to administrative positions, and the ability to choose the next school where one works. The latter two career incentives are seen as particularly attractive.

Source: OECD, 2005 (p. 159)[1]; OECD, 2012[16]; Kang and Hong, 2008[17].

Box 1.2 Ireland's programme for "Delivering Equality of Opportunity in Schools" (DEIS)

In Ireland, secondary schools with high concentrations of students from disadvantaged backgrounds receive additional financial and other resources to promote good education outcomes. This is the result of a deliberate policy implemented by the Department for Education and Skills.

...

The governance of the school system in Ireland is complex. While the state provides almost all funding for primary and secondary education, most primary schools and a majority of secondary schools are private organisations, with a significant proportion of them managed by church authorities and religious organisations. Some 57% of 15-year-old students participating in PISA, for example, attend private secondary schools (OECD, 2016, Table II.4.6[18]). Private, but publicly funded schools receive direct payments for the salaries of teachers and other staff (e.g. special needs assistants) and grants to cover day-to-day running costs (e.g. heating, cleaning, maintenance). Schools can also undertake fundraising activities; at the secondary level, a small number of schools charge fees, but the majority do not.

Parents have the right to send their children to the school of their choice; when the school has places available, the pupil should be admitted. However, about 20% of schools are oversubscribed, and can apply selection criteria. The Department for Education and Skills regulates school-enrolment policies to ensure a fair and transparent system in all schools, which does not discriminate unfairly against students or parents.

Ireland has a long history of providing assistance to schools serving pupils from disadvantaged backgrounds. Schemes such as the Disadvantaged Areas Scheme (1984), Breaking the Cycle (1996), and Giving Children an Even Break (2001) all provided additional supports to schools to assist them in addressing the problems associated with catering for pupils from disadvantaged backgrounds. Ireland's frame of reference in addressing inequity in education is based on the definition of "educational disadvantage" as contained in the Education Act 1998: "the impediments to education arising from social or economic disadvantage which prevent students from deriving appropriate benefit from education in schools."

Delivering Equality of Opportunity in Schools (DEIS) is the most recent of such programmes, and has the explicit aim of ensuring "that the educational needs of children and young people from disadvantaged communities are prioritised and effectively addressed". The Department of Education and Skills launched DEIS in May 2005. A second DEIS Plan was launched in 2017. The rationale for DEIS is that additional resources are targeted at schools in which disadvantage is most concentrated.

DEIS provides for a standardised system for identifying levels of disadvantage (based on student socio-economic disadvantage) and an integrated School Support Programme. The initial process of identifying schools for participation in DEIS was managed externally by the Educational Research Centre (ERC) on behalf of the Department for Education and Skills. More recently, the Department's statistics section has assumed responsibility for the assessment of schools' level of disadvantage under DEIS.

Under the Schools Support Programme, schools and school clusters or communities are allocated supplementary resources and supports in line with their concentration of disadvantage. About 20% of schools in Ireland are eligible for DEIS support. Schools serving disadvantaged communities are supported with additional per-pupil funding,

...

additional staff, targeted support for school leaders and teachers (e.g. improved access to training, mentoring or coaching schemes), literacy and numeracy support services, and priority access to school meals programmes. They also have access to the School Completion Programme and Home School Community Liaison Services of Tusla, the Child and Family Agency that has a statutory remit in relation to school attendance, participation and retention, and school-community liaison services. Primary schools in areas with the highest concentrations of pupils at risk of educational disadvantage, in particular, receive sufficient staff to reduce class size to below 20 students. Secondary schools in the School Support Programme are provided with greater access to career-guidance professionals and enhanced curricular choices (through staffing and funding support for the Junior Certificate School Programme and the Leaving Certificate Applied Programme).

There is evidence from research undertaken to date that the DEIS programme is having a positive effect on tackling educational disadvantage and reducing gaps in reading and mathematics at the primary level, and in attainment and retention at the post-primary level. However, research also shows that overall performance in DEIS schools continues to remain below the national average.

Source: Department of Education and Skills (2011) "OECD Project Overcoming School Failure: Policies that Work, National Report, Ireland", www.oecd.org/education/innovation-education/49624509.pdf (accessed 12 February 2018); Department of Education and Skills (2017), "DEIS Plan 2017: Delivering Equality of Opportunity in Schools", www.education.ie/en/Publications/Policy-Reports/DEIS-Plan-2017.pdf (accessed 12 February 2018); Department of Education and Skills (n.d.), Department of Education and Skills website, www.education.ie/en (accessed 12 February 2018).

Notes

1. "The quality of teaching is determined not just by the quality of the teachers, but also by the environment in which they work" (OECD, 2005[1]). "The quality of an education system cannot exceed the quality of its teachers, the quality of teaching and teachers cannot exceed the quality of the work organisation in which teachers find themselves, the quality of teacher selection and education, the quality of teacher careers and the quality of teacher evaluation" (Schleicher, 2011[22]). "The quality of an education system cannot exceed the quality of its teachers, and the quality of teachers cannot exceed the quality of the work organisation in schools and the ways in which teachers are supported" (OECD, 2013[23]).

2. The "Indicators of Education Systems" (INES) programme provides data for the indicators produced annually in *Education at a Glance*. The Network for the Collection and Adjudication of System-Level Descriptive Information on Educational Structures, Policies and Practices (NESLI), in particular, develops questionnaires for policy-makers and collects data on system-level indicators in education. While teacher salaries have been a long-standing aspect covered by these questionnaires, recently NESLI has developed thematic questionnaires on teacher evaluation, professional development requirements, career and compensation structures. The "Teaching and Learning International Survey" (TALIS) programme is an international, large-scale survey that focuses on the working conditions of teachers and the learning environment in schools. The "Programme for International Student Assessment" (PISA) programme is a triennial survey that assesses the extent to which 15-year-old students, near the end of their compulsory education, have acquired key knowledge and skills that are essential for full participation in modern societies. As a policy-oriented survey, PISA aims to link student performance data to key factors that shape their learning, in and outside of school, in order to highlight differences in performance and identify the characteristics of students, schools and education systems that perform well. In line with this goal and with the increasing interest in teachers' working conditions and teacher policies, PISA 2015 has extended the scope of the NESLI data collection to cover a larger set of countries, and has introduced a teacher questionnaire among its optional instruments.

3. Examples of such "myths" include the view that in all top-performing countries, teacher-training programmes are highly selective and teachers are paid well, even in comparison with other professionals; or that the most successful countries attract the most talented teachers to the most challenging schools. The remaining chapters will verify, qualify, temper or even dispel these myths, based on the available data.

4. The greater emphasis on school processes in more recent publications about teacher policies, and in particular on less formally regulated aspects such as mentoring, feedback and professional learning supported by peer networks within and across schools, also reflects a paradigm shift in the study and practice of public administration and management. The latter has moved recently from the study of "public administration" as a strong bureaucracy that administers set rules and guidelines, and of "new public management", which emphasises managerial leadership, inputs *and* outputs control (through performance management), and market mechanisms, to viewing (and promoting) a "new public governance" which emphasises how the implementation of policies and the delivery of public services hinges critically on micro-level processes, on social capital (as opposed, or in addition to human capital), and on inter-dependencies between actors at different levels (e.g. Osborne [2006[21]]).

5. In particular, in 2015 and 2016, the OECD extended the indicators developed by the INES programme for the annual *Education at a Glance* publication to partner countries and economies participating in PISA, through a special system-level data collection conducted in collaboration with PISA Governing Board members and National Project Managers. The available information includes indicators on teacher salaries, on teacher preparation, selection, development and career (OECD, 2014[19]) and on teacher-appraisal systems (OECD, 2015[20]). The system-level information used in this report also includes the answers of principals of schools participating in PISA about schools' level of responsibility for selecting teachers and determining their starting salaries and career steps and about teachers' professional development practices, aggregated at the country level. TALIS data based on reports by lower-secondary teachers and principals are used to compare the occupational prestige of the teaching profession, the perception of teacher appraisal and feedback

mechanisms, and the nature of teacher preparation and induction. System-level data have often limitations: For example, the indicator of pay levels used in this report, teachers' statutory salary expressed as a ratio of GDP per capita, is based on statutory rather than actual salaries, does not include other benefits such as vacations and pensions, and the reference point, GDP per capita, does not reflect compensation levels in comparable occupations. But any better indicator would inevitably result in a smaller number of countries being available for the analysis.

6. The reader interested in more comprehensive treatments of teacher policies or interested in particular countries shall complement the analysis in this report with in-depth reports based on systematic reviews, such as *Teachers Matter* (OECD, 2005[1]), *Empowered Educators* (Darling-Hammond et al., 2017[3]), *Education Policy Outlook Country Profiles* (OECD, 2018[24]), a forthcoming report focusing on human resources within the *OECD Review of Policies to Improve the Effectiveness of Resource Use in Schools* (OECD, 2018[25]), and existing and forthcoming reports and thematic analyses based on TALIS data (OECD, 2018[26]).

7. High-performing countries and economies are defined as those that, in PISA 2015, had an above-average share of students performing at the highest levels (Level 5 and above) in science, reading or mathematics – reflecting the ability of these systems to nurture excellence – and, at the same time, a below-average share of students who do not attain the baseline level of proficiency (Level 2) in all three subjects – reflecting the inclusive nature of these systems and their ability to assure minimum standards of learning for all. These criteria led to the selection of 17 countries and economies: Australia, Beijing-Shanghai-Jiangsu-Guangdong (China) (hereafter "B-S-J-G [China]"), Canada, Estonia, Finland, Germany, Hong Kong (China), Japan, Korea, Macao (China), the Netherlands, New Zealand, Norway, Singapore, Slovenia, Switzerland and Chinese Taipei. Two subnational jurisdictions in OECD countries that meet the above-mentioned criteria for high-performing systems, and that contribute to the system-level indicators published in the OECD's annual report, *Education at a Glance*, were also considered: England (United Kingdom) and the Flemish Community of Belgium.

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