



## 4

# Who aspires to a career in teaching?

This chapter examines the characteristics of 15-year-old students who expect to work as teachers, and how these changed between 2006 and 2015. It also explores how the number and type of students who aspire to a career in teaching relates to teachers' salaries, the social status of the teaching profession in the country, and teachers' working conditions.

### **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.



A growing awareness that the quality of schooling critically depends on teachers' skills has led to mounting concerns among policy makers about the difficulty of attracting high-achieving and motivated candidates into the teaching profession (Bruns and Luque, 2015<sup>[11]</sup>). Across PISA-participating countries, many school principals reported that a shortage of high-quality teachers hinders their schools' ability to provide quality instruction, especially in the subjects of mathematics and science (OECD, 2013, pp. 100-101<sup>[2]</sup>; OECD, 2016, pp. 202-203<sup>[3]</sup>). In Europe and the United States, such concerns are often compounded by worries that the gender, cultural and language background of the teaching workforce does not reflect that of students they will teach (Dilworth and Coleman, 2014<sup>[4]</sup>; Donlevy, Meierkord and Rajania, 2016<sup>[5]</sup>).

### What the data tell us

- On average across OECD countries, in PISA 2006, about 5.5% of 15-year-old students expected to work as teachers when they are 30, while in PISA 2015 about 4.2% of students expected to work as teachers.
- In PISA 2015, the typical profile of students who expected to work as teachers later on varied across countries; but in many countries, students who expected to work as teachers had poorer mathematics and reading skills than students who expected to work in other professions that, like teaching, require at least a university degree.
- In PISA 2015, boys and immigrant students were less likely than girls and students without an immigrant background to expect to work as teachers.
- In most countries, the typical profile of students who expected to work as teachers did not change between 2006 and 2015.

In many countries student diversity is on the rise, due to international migration or the expansion of secondary education; but male teachers, or teachers with a migrant or minority background, remain rare (OECD, 2005, p. 59<sup>[6]</sup>; Donlevy, Meierkord and Rajania, 2016<sup>[5]</sup>). Yet there is evidence that when teachers have similar experiences as their students, they are better able to understand their students' needs and approach them in ways that best promote their learning (Dee, 2004<sup>[7]</sup>; Egalite and Kisida, 2018<sup>[8]</sup>; Egalite, Kisida and Winters, 2015<sup>[9]</sup>).

A more diverse teaching workforce could be beneficial for all students, not just boys and minority students. A teaching force that reflects the composition of the student body – ethnic, religious and cultural minorities, and students with an immigrant background – provides all students with potential role models who have positive connotations (i.e. teachers) and come from diverse backgrounds. Such exposure to different backgrounds can help children learn to approach social diversity positively (Binder et al., 2009<sup>[10]</sup>; Mercer and Mercer, 1986<sup>[11]</sup>). Similarly, a teaching workforce that includes a larger number of men, particularly in early education and in subjects such as the arts and the humanities, can prevent boys and girls from forming strong views on the feminine or masculine nature of particular jobs (such as the caring professions) or subjects (Cheryan et al., 2011<sup>[12]</sup>; Moss-Racusin and Johnson, 2016<sup>[13]</sup>).



While several large-scale international studies allow researchers and policy makers to examine the evolution of student background characteristics over time, comparable data on the diversity of the teaching workforce is limited, particularly with respect to immigrant background and socio-economic status. To provide more insights into what motivates a diverse and skilled pool of candidates to enter the teaching profession, this chapter uses data from PISA 2006 and 2015, and analyses cross-country differences and trends over time in the characteristics of 15-year-old students who expect to work as teachers when they are 30 years old. This chapter also identifies factors that are associated with countries' ability to attract individuals with high skills and with an unconventional background (i.e. men and children of non-native parents) to the teaching profession.

Students' career expectations illustrate the extent to which teenage students, and particularly those with high academic potential, consider a career in teaching. Factors that shape early career aspirations greatly determine the overall pool of prospective candidates to enter the "teaching pipeline", even though alternative pathways that enable adults to enter the profession at any point in their lives can mitigate the influence of these factors.

The aim of this chapter is to identify differences between countries in the extent to which 15-year-old students, high-achieving students and students with unconventional backgrounds expect to work as teachers. The chapter also attempts to explain these differences between countries by relating them to the working conditions, social status and monetary compensation enjoyed by teachers in different countries.

The chapter is structured as follows: a first section on teacher shortages in PISA-participating countries introduces the analysis and provides important context for the study of 15-year-olds' expectations of a career in teaching. Attracting high-achieving students to the teaching profession might be particularly important in countries that suffer from shortages of teachers, or where perceptions of teacher shortages are worsening over time.

Then, descriptive statistics based on data from PISA 2015 are reported. Descriptive analyses illustrate, for each country, the percentage of students who expect to work as teachers and differences in the background characteristics between students who expect to work as teachers and those who do not. In order to draw the profile of students who expect to work as teachers in each country, the chapter examines differences in students' expectations of a teaching career by gender, immigrant background, parents' highest educational attainment, and students' performance in reading and mathematics.

The chapter then examines whether between-country differences in teachers' salaries and the social status of the teaching profession explain between-country differences in students' expectations of a career in teaching;<sup>1</sup> and whether changes in teachers' salaries and working conditions over time are related to changes, between 2006 and 2015, in the number and type of students who aspire to a career in teaching.<sup>2</sup>

Most analyses in this chapter rely on a single question included in the PISA 2006 and 2015 surveys that asked 15-year-old students: "What kind of job do you expect to have when you are about 30 years old?" Student responses to this open-ended question were coded and classified using the four-digit classification numbers of the International Standard Classification



of Occupations (ISCO). Analyses reported in this chapter refer to students who indicated that they expect to work as teachers in general, or specifically as primary, secondary or special education teachers. Students who reported that they expect to work as college, university, higher education or pre-primary teachers, or as pre-primary or primary associate teachers are excluded.

When comparing students' career expectations across countries and time using PISA data, it is important to bear in mind a number of limitations. First, the question on career expectations has more missing values than other questions in PISA. Second, the predictive value of students' reports on their future career can differ across countries, because of differences in the degree to which students are required to make choices at an early age to enter specific careers, and the existence of flexible pathways in the education system and labour market. Finally, the PISA target population covers 15-year-olds enrolled in lower secondary or upper secondary school, but enrolment rates of 15-year-olds differ across countries and over time. This variation could partly contribute to the differences in students' career expectations reported when they are 15 years old. These limitations are discussed in greater detail in Boxes 4.1 and 4.2.

#### Box 4.1 **How reliable are PISA data on students' career expectations?**

Answering open-ended questions, such as *"What kind of job do you expect to have when you are about 30 years old?"*, requires more effort from students than answering other questions in the background questionnaire. As a result, the PISA career-expectations question has response rates that, in some countries, are considerably lower than the typical PISA question. The high share of missing responses contributes to uncertainty in cross-country comparisons.

On average across OECD countries, about 11% of students in 2015 (14% of students in 2006) had missing responses on the career-expectations question (Table 4.6). By contrast, only about 2% of students in 2015 had missing responses on the number of televisions at home (*"How many of these are there at your home? Televisions"*), and 10% of students had missing responses on attendance at a science club (*"How often do you do these things? Attend a science club"*). These two questions were chosen for comparison because they appeared in both the PISA 2015 and 2006 student questionnaires, were easy for students to answer because of the closed format, and they appeared before (televisions) and after (attend a science club) the question about career expectations.

The percentage of students with missing responses on the career-expectations question varies widely across countries (Table 4.6). The highest missing-response rate on career expectations in 2015 was observed in Germany, where about 26% of students had missing or invalid responses, followed by Austria (23%), Iceland (22%), Canada (21%) and Chinese Taipei (21%). In Mexico, Peru and Viet Nam, only around 3% of students had missing or invalid responses to the career-expectations question; in Korea, around 4% of students had missing or invalid responses.

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This variation across countries might also reflect genuine uncertainty, or indecision, about one's future, rather than just a lack of engagement with the more demanding response format. An indirect indicator of indecision and a lack of clear career plans is students' willingness to report on their parents' occupation (which is also open-ended and therefore demanding) but not on their expectations for their own future occupation. Table 4.7 reports, for each country with available data, the percentage of students who had valid responses for their father's and mother's occupation but invalid responses for their own future occupation.

On average across OECD countries, about 8% of students in 2015 reported their parents' occupation but not their own career expectations (Table 4.7). The largest percentages of students who reported their parents' occupations but not their own expected occupations were observed in Austria (20%), Iceland (18%), Chinese Taipei (17%), Canada and Georgia (16%).

#### Box 4.2 **How predictive of the future are teenagers' career expectations?**

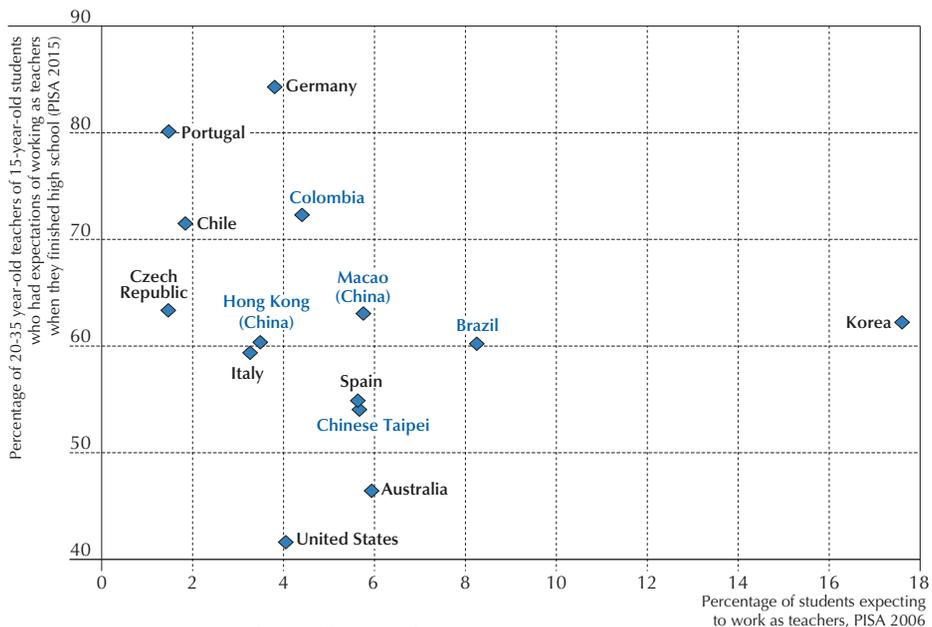
Prior research based on the recollections of student teachers, or of in-service teachers, suggests that early expectations of a teaching career play an important role in decisions to enter teacher training and the teaching profession (Aksu et al., 2010<sup>[14]</sup>; Richardson and Watt, 2005<sup>[15]</sup>), and that individuals typically decide to become teachers during the secondary school years (Lee, Clery and Presley, 2001<sup>[16]</sup>; Page and Page, 1984<sup>[17]</sup>) before graduating from high school (Brookhart and Freeman, 1992<sup>[18]</sup>). Prospective studies, which compare early career aspirations with actual careers observed during follow-up surveys for the same individuals, confirm the importance of adolescent career aspirations for career choices more generally (Ashby and Schoon, 2010<sup>[19]</sup>; Schoon and Parsons, 2002<sup>[20]</sup>).<sup>3</sup>

Data from the teacher questionnaire, an optional component of PISA 2015, provide (for 18 countries/economies) retrospective evidence on the importance of early career aspirations for the decision to become a teacher. In PISA 2015, teachers reported whether pursuing a career in the teaching profession was their goal after completing upper secondary school. On average across 14 countries that distributed the teacher questionnaire in 2015 and that have available data in both PISA 2015 and 2006, about 62% of 20-35 year-old teachers who teach 15-year-old students had chosen to become teachers by the end of secondary school (Figure 4.1).<sup>4</sup> The data also highlight substantial variations across countries. In Germany, about 84% of young teachers had chosen their career by the end of secondary school, while in the United States, only about 42% of these teachers of 15-year-old students had chosen to become teachers by the end of secondary school. The remaining countries fall between these two extremes.

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Figure 4.1 ■ **When did today's teachers decide to work as teachers?**



Source: OECD PISA 2015 Database, Tables 4.4 and 4.5.

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Figure 4.1 shows that in many countries – including Colombia, Germany and Portugal – where relatively few students reported, in PISA 2006, that they expect to work as teachers, the critical education and career choices that lead to a teaching career typically start before the end of high school, as indicated by the high share of current teachers who reported that working in the teaching profession was already their goal when they finished high school. By contrast, in Australia, Chinese Taipei and the United States, around half of today's young teachers had decided to work as teachers only after they had left high school, possibly because tertiary studies and education systems offer multiple, and relatively flexible, pathways into the teaching profession. In these countries, 15-year-olds' expectations of a career in teaching should be viewed as a significant indication of the attractiveness of the profession; but policies targeted at older adults can redress imbalances and shortages of qualified teachers.

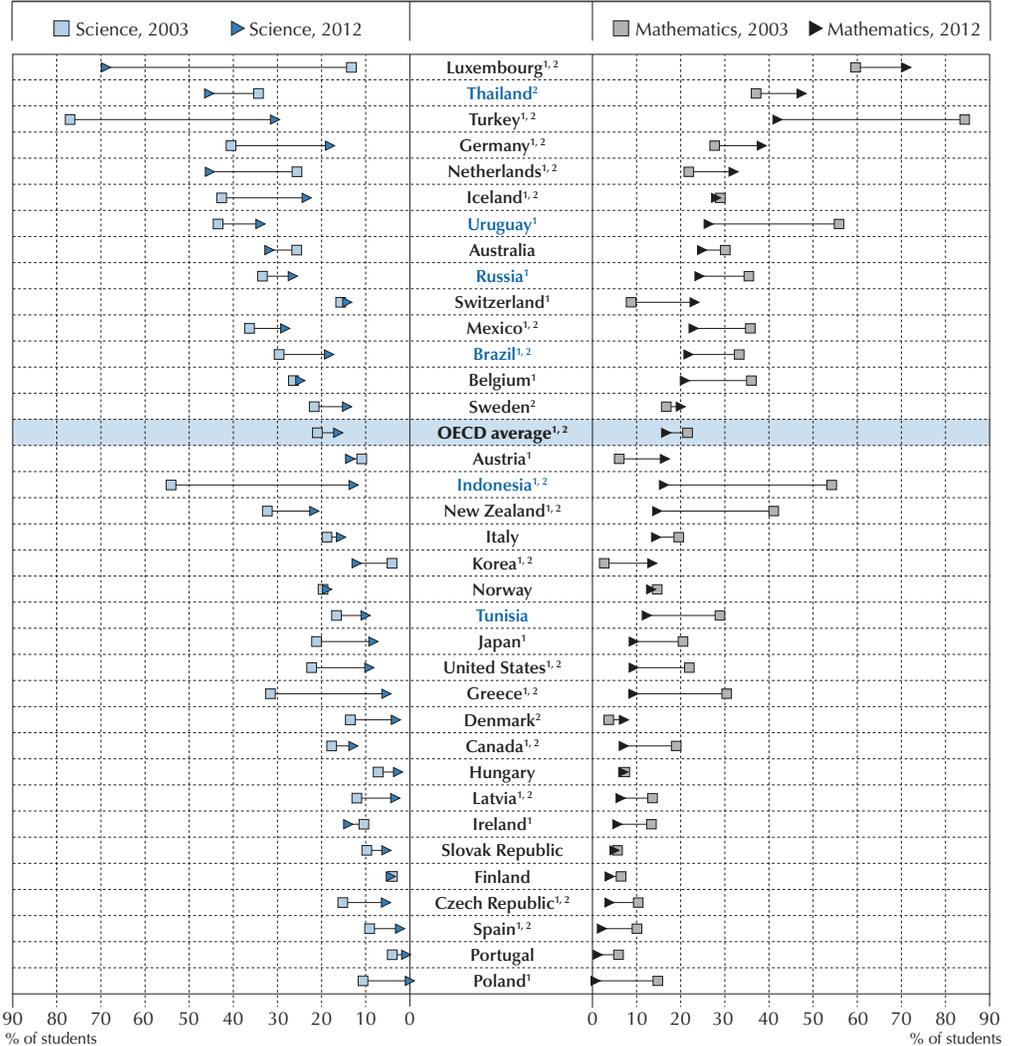
## TRENDS IN THE PERCEPTION OF TEACHER SHORTAGES

School principals' reports show that shortages of qualified mathematics and science teachers are persistent and affect a large proportion of students in several countries. In 2003 and 2012, principals of schools sampled for PISA were asked whether their school's capacity to provide instruction was hindered by a lack of qualified science or mathematics teachers.<sup>5</sup>



Figure 4.2 ■ Trends between 2003 and 2012 in principals' reports of teacher shortages

Percentage of students whose principal reported that the school's capacity to provide instruction is hindered a lot by a lack of qualified mathematics or science teachers



1. The change between 2003 and 2012 in the percentage of students whose principal reported that the school's capacity to provide instruction is hindered a lot by a lack of qualified teachers in mathematics is statistically significant.
2. The change between 2003 and 2012 in the percentage of students whose principal reported that the school's capacity to provide instruction is hindered a lot by a lack of qualified teachers in science is statistically significant.

**Note:** The OECD average in this figure includes only OECD countries with comparable data in 2012 and 2003.

Countries are ranked in descending order of the percentage of students whose principal reported, in 2012, that the school's capacity to provide instruction is hindered a lot by a lack of qualified mathematics teachers.

**Source:** OECD (2013), *PISA 2012 Results: What Makes Schools Successful? Resources, Policies and Practices (Volume IV)*, Table IV.3.37, <http://dx.doi.org/10.1787/888932957479>.

**StatLink** <http://dx.doi.org/10.1787/888933740801>



On average across OECD countries, about 17% of students in 2012 were in schools whose principals reported that the school's capacity to provide instruction is hindered by a lack of qualified mathematics and science teachers. According to school principals, teacher shortages that hinder instruction affected the largest proportion of students in Luxembourg (69% in mathematics and 71% in science), Jordan (46% in mathematics and 50% in science), Thailand (45% in mathematics and 47% in science), Chile (43% in mathematics and 42% in science) and the Netherlands (43% in mathematics and 32% in science) (OECD, 2013, Figure IV.3.5<sup>[2]</sup>).

These percentages are high but, in many countries, they mark an improvement over the even larger proportions observed in 2003. Students in 2012 were less likely than students in 2003 to attend schools whose principal reported that a lack of qualified teachers hinders learning. On average across OECD countries in 2003, about 21% of students who participated in PISA attended schools whose principal reported that a lack of qualified mathematics and science teachers hinders student learning "to some extent" or "a lot" (Figure 4.2). Decreases in the number of principals who reported shortages of qualified mathematics teachers were observed in 20 out of the 35 countries and economies with comparable data between 2003 and 2012 (Figure 4.2).

The largest improvement was observed in Turkey (a 42 percentage-point decrease in the share of 15-year-old students whose principals reported that a lack of qualified teachers hinders instruction in mathematics, and a 46 percentage-point decrease concerning science instruction). Large improvements were also observed in Greece and Indonesia (Figure 4.2).

A deteriorating trend was observed in six countries concerning mathematics teachers (Austria, Germany, Korea, Luxembourg, the Netherlands and Switzerland), and in four countries concerning science teachers (Korea, Luxembourg, the Netherlands and Thailand). In these countries, more students in 2012 than in 2003 attended schools whose principals reported that a lack of qualified science/mathematics teachers hinders instruction in science/mathematics.

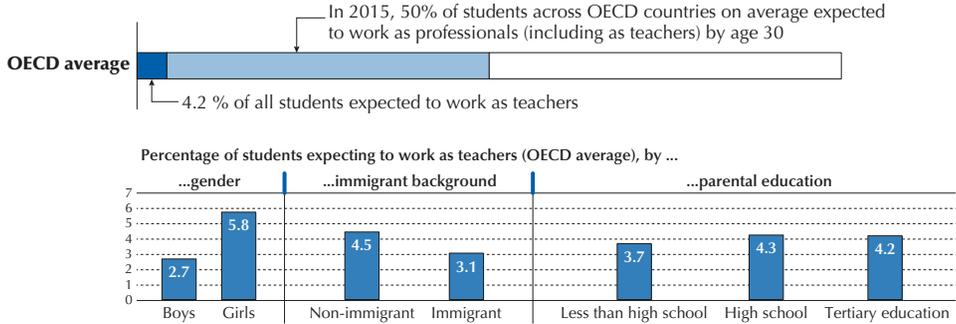
## **BACKGROUND CHARACTERISTICS OF STUDENTS WHO EXPECT TO WORK AS TEACHERS: EVIDENCE FROM PISA 2015**

On average in 2015, about 50% of students in OECD countries reported that they expect to work as professionals, which comprise high status occupations that typically require a university degree. Among these, about 4.2% of all students expected to work as teachers (Figure 4.3). By comparison, the number of teachers in primary, lower secondary and upper secondary education represented about 2.4% of the labour force across OECD countries in 2013.<sup>6</sup> This means that, in general, the share of students expecting a teaching career is larger than the share of working-age people who are teaching today. At least at this early stage of career orientation, concerns about the lack of candidates for a career in teaching are therefore exaggerated. In fact, teaching enjoys a clear advantage over other occupations that 15-year-olds may not even know exist: all 15-year-old students have had some contact with teachers and have at least an approximate idea of what they do and of their working conditions.

However, the percentage of students who expected, in 2015, to have a career as teacher varied widely across countries. The teaching profession appeared to be a particularly sought-after profession in Algeria, Beijing-Shanghai-Jiangsu-Guangdong (China) (hereafter "B-S-J-G [China]") Ireland, Korea, Kosovo, Luxembourg, Thailand, Tunisia and Viet Nam.



Figure 4.3 [1/2] ■ Students who expect to work as teachers



OECD	Percentage of students expecting a career in teaching	Percentage of students expecting a career as professionals	Percentage of students expecting a career in teaching, by gender		Percentage of students expecting a career in teaching, by immigrant background		Percentage of students expecting a career in teaching, by parental education		
			Boys	Girls	Non-immigrant	Immigrant	Less than high school	High school	Tertiary education
Australia	5.7	57.4	2.9	8.6	6.3	4.3	5.6	6.2	5.6
Austria	5.2	49.1	2.3	8.2	5.6	3.7	5.5	5.6	5.1
Belgium*	4.5	51.2	4.0	4.9	4.6	4.1	4.1	4.2	4.6
Canada	1.1	69.3	0.4	1.7	1.2	0.9	0.5	1.3	1.0
Chile	2.7	61.9	1.7	3.8	2.7	1.9	2.8	3.0	2.6
Czech Republic	3.3	35.6	1.5	5.2	3.4	2.6	0.6	3.6	3.3
Denmark	1.2	33.1	0.7	1.6	1.1	1.5	1.2	1.3	1.1
Estonia	1.4	55.3	0.7	2.1	1.4	1.3	0.0	1.6	1.4
Finland	4.6	37.1	2.8	6.5	4.8	0.4	0.0	3.6	4.9
France	3.8	44.3	2.1	5.4	4.0	2.5	4.0	3.9	3.8
Germany	3.6	37.2	1.9	5.2	3.6	3.6	2.6	3.9	4.2
Greece	5.9	59.4	3.9	8.0	5.9	6.5	5.4	5.8	6.0
Hungary	2.1	37.2	1.2	3.1	2.0	5.7	0.0	1.8	2.6
Iceland	2.1	60.3	1.8	2.4	2.1	2.1	2.6	2.3	2.0
Ireland	11.8	61.4	6.7	16.9	12.9	4.3	11.6	13.4	11.1
Israel	4.9	54.0	3.0	6.7	5.4	2.7	14.3	6.5	3.7
Italy	3.2	48.7	1.1	5.2	3.2	3.5	3.3	3.1	3.3
Japan	6.7	41.4	7.4	6.1	6.7	2.9	3.8	4.5	8.1
Korea	10.7	52.5	9.2	12.3	10.7	c	4.7	9.5	11.7
Latvia	0.8	43.4	0.2	1.4	0.8	0.8	0.0	1.3	0.5
Luxembourg	9.9	49.4	6.9	12.6	12.5	7.8	9.5	9.5	10.3
Mexico	4.1	73.1	2.4	5.9	4.1	6.7	5.6	3.3	2.5
Netherlands	4.9	36.3	3.5	6.3	5.1	3.4	3.9	5.5	4.8
New Zealand	3.0	51.4	1.2	4.8	3.4	1.8	4.0	3.8	2.7
Norway	3.2	46.7	1.8	4.7	3.4	1.9	1.8	3.2	3.4
Poland	2.4	39.7	1.2	3.7	2.4	c	1.5	2.4	2.9
Portugal	1.3	55.4	1.3	1.3	1.4	0.1	1.4	1.3	1.3
Slovak Republic	2.9	34.5	0.9	5.1	2.9	0.0	1.8	3.0	2.9
Slovenia	4.4	45.7	2.2	6.8	4.6	2.8	3.0	4.1	4.8
Spain	5.6	60.7	4.1	7.1	5.8	4.8	5.4	5.7	5.7
Sweden	1.5	42.2	1.1	2.0	1.5	1.5	1.3	0.9	1.7
Switzerland	6.0	38.4	3.1	9.1	7.1	3.9	3.5	5.9	6.5
Turkey	5.6	64.5	3.9	7.4	5.5	6.2	6.4	6.3	3.9
United Kingdom	5.0	61.4	3.7	6.3	5.5	2.8	5.2	6.0	4.7
United States	2.8	61.2	1.4	4.2	3.1	2.2	2.3	2.4	3.2

\* French and German-speaking Communities.

Notes: Values that are statistically significant (difference boys–girls, or immigrant – non-immigrant or tertiary – less than high school) are indicated in bold (see Annex A).

Professionals include scientists, engineers, medical professionals, teachers, and business, legal, social science and related professionals.

Countries are ranked in descending order of the percentage of 15-year-old students who expect to be working in the teaching profession when they are 30 years old.

Source: OECD PISA 2015 Database, Tables 4.1 and 4.2.

StatLink <http://dx.doi.org/10.1787/888933740820>

Figure 4.3 [2/2] ■ Students who expect to work as teachers

Partners	Percentage of students expecting a career in teaching	Percentage of students expecting a career as professionals	Percentage of students expecting a career in teaching, by gender		Percentage of students expecting a career in teaching, by immigrant background		Percentage of students expecting a career in teaching, by parental education		
			Boys	Girls	Non-immigrant	Immigrant	Less than high school	High school	Tertiary education
Algeria	23.0	62.4	<b>15.3</b>	<b>31.4</b>	23.1	20.5	<b>27.8</b>	22.0	<b>18.5</b>
Brazil	2.4	68.5	<b>1.7</b>	<b>3.0</b>	2.4	4.1	<b>3.4</b>	1.9	<b>1.8</b>
B-S-J-G (China)	9.6	39.4	<b>4.8</b>	<b>15.0</b>	<b>9.7</b>	<b>0.0</b>	9.6	9.8	9.3
Bulgaria	1.6	50.0	<b>0.7</b>	<b>2.6</b>	<b>1.6</b>	<b>0.0</b>	1.8	1.9	1.4
CABA (Argentina)	2.2	72.3	1.5	2.7	2.1	2.5	2.2	3.6	1.8
Colombia	0.0	61.9	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Costa Rica	3.3	64.4	3.0	3.5	3.3	2.5	<b>4.7</b>	3.1	<b>2.6</b>
Croatia	6.6	41.9	<b>2.7</b>	<b>10.3</b>	6.9	5.0	4.7	8.1	5.6
Dominican Republic	1.2	70.6	0.8	1.6	<b>1.2</b>	<b>0.0</b>	<b>1.8</b>	1.5	<b>0.8</b>
FYROM	7.8	54.3	<b>5.9</b>	<b>9.9</b>	7.8	5.2	<b>11.8</b>	8.1	<b>6.8</b>
Georgia	2.2	55.5	<b>1.0</b>	<b>3.5</b>	<b>2.2</b>	<b>0.0</b>	4.9	2.8	1.7
Hong Kong (China)	6.6	56.6	6.1	7.0	<b>5.7</b>	<b>8.2</b>	6.9	6.4	6.8
Indonesia	0.3	35.7	<b>0.1</b>	<b>0.4</b>	0.3	c	0.3	0.2	0.3
Jordan	1.0	66.1	<b>0.1</b>	<b>1.7</b>	0.9	0.9	1.3	1.6	0.6
Kosovo	17.3	66.0	<b>9.2</b>	<b>25.3</b>	17.4	13.3	<b>23.2</b>	20.3	<b>14.5</b>
Lebanon	8.4	70.1	<b>4.1</b>	<b>12.0</b>	8.0	11.5	<b>11.7</b>	9.3	<b>5.7</b>
Lithuania	1.8	45.9	<b>0.9</b>	<b>2.7</b>	<b>1.8</b>	<b>0.3</b>	2.9	2.2	1.6
Macao (China)	8.2	50.8	<b>6.6</b>	<b>9.8</b>	7.9	8.5	8.8	7.9	7.8
Malta	8.4	57.3	<b>5.4</b>	<b>11.4</b>	<b>8.8</b>	<b>3.7</b>	8.5	8.6	8.1
Moldova	2.7	48.0	<b>0.9</b>	<b>4.6</b>	2.6	1.5	2.3	3.4	2.2
Montenegro	6.9	46.7	<b>3.3</b>	<b>10.5</b>	<b>7.1</b>	<b>3.3</b>	9.9	8.2	6.2
Peru	1.4	68.0	<b>0.8</b>	<b>1.9</b>	<b>1.3</b>	<b>0.0</b>	<b>2.7</b>	1.1	<b>1.1</b>
Qatar	0.0	59.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Romania	4.0	51.3	<b>2.5</b>	<b>5.4</b>	4.0	c	3.4	4.4	3.7
Russia	2.6	50.9	<b>0.6</b>	<b>4.5</b>	2.6	3.3	2.0	4.8	2.6
Singapore	4.4	60.1	<b>3.5</b>	<b>5.3</b>	4.5	4.1	5.6	4.2	4.4
Chinese Taipei	4.1	46.2	4.3	3.9	4.2	c	3.8	3.5	4.5
Thailand	10.2	40.5	<b>5.2</b>	<b>14.0</b>	10.2	12.2	<b>13.1</b>	9.0	<b>6.6</b>
Trinidad and Tobago	3.7	55.9	<b>1.3</b>	<b>5.9</b>	3.9	2.2	4.2	3.9	3.5
Tunisia	11.8	66.3	<b>9.7</b>	<b>13.5</b>	11.5	19.6	<b>14.6</b>	12.7	<b>9.3</b>
United Arab Emirates	1.5	58.5	<b>0.4</b>	<b>2.5</b>	<b>2.3</b>	<b>0.9</b>	<b>2.7</b>	2.7	<b>1.1</b>
Uruguay	4.9	57.5	<b>1.9</b>	<b>7.6</b>	<b>5.1</b>	<b>0.0</b>	<b>6.3</b>	4.8	<b>3.5</b>
Viet Nam	12.4	43.8	<b>5.9</b>	<b>18.6</b>	12.3	c	<b>14.3</b>	9.2	<b>7.3</b>

Notes: Values that are statistically significant (difference boys–girls, or immigrant – non-immigrant or tertiary – less than high school) are indicated in bold (see Annex A).

Professionals include scientists, engineers, medical professionals, teachers, and business, legal, social science and related professionals.

Countries are ranked in descending order of the percentage of 15-year-old students who expect to be working in the teaching profession when they are 30 years old.

Source: OECD PISA 2015 Database, Tables 4.1 and 4.2.

StatLink  <http://dx.doi.org/10.1787/888933740839>

By contrast, the teaching profession attracted less than 1.5% of 15-year-olds in Albania, Canada, Colombia, Denmark, the Dominican Republic, Estonia, Indonesia, Jordan, Latvia, Peru, Portugal, Qatar and the United Arab Emirates.

The typical student expecting a career in teaching is, in most countries, a girl with no immigrant background (Table 4.1). She tends to be academically weaker than other students who expect, just like her, a professional career requiring university-level education (Table 4.3).

Several top-performing countries, such as Finland, Korea and Singapore, build high-quality education workforces by recruiting the best high school graduates into teacher-education institutions and then channelling them into the teaching profession (Kang and Hong, 2008<sup>[21]</sup>;



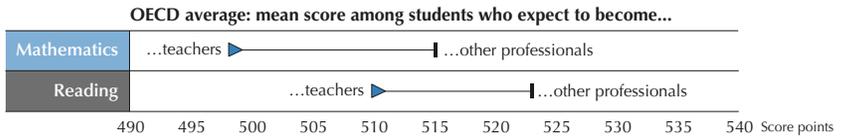
Sahlberg, 2010<sup>[22]</sup>; Barber and Mourshed, 2007<sup>[23]</sup>)<sup>7</sup>. Teachers' verbal and mathematical skills, acquired in school, are indeed strongly related to student outcomes (Darling-Hammond and Youngs, 2002<sup>[24]</sup>; Wayne and Youngs, 2003<sup>[25]</sup>) and have been found to predict cross-country differences in the reading and mathematics skills of students, even after accounting for the average skills in the adult population (Hanushek, Piopiunik and Wiederhold, 2014<sup>[26]</sup>; Meroni, Vera-Toscano and Costa, 2015<sup>[27]</sup>). By examining the reading and mathematics scores of students who expect to work as teachers, this chapter can indicate how successful countries are at attracting high-achieving students into teaching careers.

While the Survey of Adult Skills (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<sup>[26]</sup>), PISA 2015 reveals marked differences across countries in the skills profile of students who expected to work as teachers. On average across OECD countries, and in a majority of countries/economies, students who aspired to be teachers had significantly lower reading and mathematics scores than students who expected to pursue professional occupations other than teaching (Figure 4.4). Furthermore, the skills gap between students who expected a career in teaching (would-be teachers) and students who expected a career as professionals (would-be professionals) tended to be larger in low-performing countries than in top-performing countries. The linear correlation coefficient (hereafter indicated by the letter “*r*”) between average mathematics performance, on the one hand, and the difference in performance between would-be teachers and would-be professionals, more generally, is 0.45 (see Figure 1.3 in Chapter 1). This suggests that teaching is not an attractive career for high-achieving students in a majority of countries, particularly in countries that perform below the OECD average in PISA.

The largest differences in mathematics skills between would-be teachers and would-be professionals were observed in Bulgaria, Georgia, Israel, Latvia, Lebanon, Peru, Portugal, Turkey, the United Arab Emirates and Uruguay. In these countries, would-be teachers scored at least 40 points below would-be professionals. By contrast, in Japan and Korea, students who expected to work as teachers scored higher in mathematics than students who aspired to be professionals, but not teachers, and there was no difference between the two groups of students in average reading scores. In Austria and Slovenia, students who expected to work as teachers scored higher in reading than students who aspired to be professionals, but not teachers, and there was no difference between the two groups in average mathematics scores. In Chile, Ciudad Autónoma de Buenos Aires (Argentina) (hereafter “CABA [Argentina]”), the Czech Republic, Denmark, the Dominican Republic, Estonia, Germany, Hong Kong (China), Hungary, Iceland, Jordan, Norway, New Zealand, Poland, Russia, Singapore, Sweden, Switzerland, Chinese Taipei and the United States, there was no difference in average reading and mathematics scores between students who expected to work as teachers and those who expected to work as other professionals (Figure 4.4).

Women represent more than two in three teachers and academic staff at all levels of education (i.e. from pre-primary through tertiary education) (OECD, 2016<sup>[28]</sup>). This pattern has become a source of concern in some countries. The proportion of female teachers has been rising since the early 1990s, and that over-representation of women in the teaching force – what some have termed the “feminisation” of teaching (Kelleher et al., 2011<sup>[29]</sup>) – might even increase in the coming years, as male teachers, who tend to be older, begin to retire (OECD, 2005<sup>[16]</sup>; UNESCO, 2012<sup>[30]</sup>).

Figure 4.4 [1/2] ■ **Mathematics and reading performance among students who expect to work as teachers**



OECD	Mean score in mathematics among students who expect to become...		Mean score in reading among students who expect to become...	
	Teachers	Other professionals	Teachers	Other professionals
Australia	493	521	512	535
Austria	520	523	534	516
Belgium*	<b>496</b>	<b>528</b>	<b>492</b>	<b>527</b>
Canada	515	534	538	547
Chile	426	438	473	478
Czech Republic	537	534	539	539
Denmark	528	529	526	525
Estonia	546	539	553	543
Finland	<b>529</b>	<b>545</b>	<b>555</b>	<b>567</b>
France	<b>510</b>	<b>533</b>	<b>529</b>	<b>547</b>
Germany	547	545	568	556
Greece	<b>451</b>	<b>475</b>	<b>475</b>	<b>496</b>
Hungary	527	526	526	520
Iceland	498	505	497	504
Ireland	<b>503</b>	<b>522</b>	<b>527</b>	<b>544</b>
Israel	<b>430</b>	<b>480</b>	<b>439</b>	<b>493</b>
Italy	<b>479</b>	<b>514</b>	<b>495</b>	<b>515</b>
Japan	565	552	545	537
Korea	<b>554</b>	<b>544</b>	546	541
Latvia	<b>458</b>	<b>503</b>	<b>469</b>	<b>515</b>
Luxembourg	<b>505</b>	<b>528</b>	<b>512</b>	<b>530</b>
Mexico	<b>392</b>	<b>415</b>	<b>407</b>	<b>431</b>
Netherlands	<b>511</b>	<b>549</b>	<b>508</b>	<b>544</b>
New Zealand	502	515	535	538
Norway	518	525	543	545
Poland	521	534	534	544
Portugal	<b>471</b>	<b>514</b>	<b>476</b>	<b>522</b>
Slovak Republic	<b>482</b>	<b>517</b>	<b>480</b>	<b>506</b>
Slovenia	545	538	<b>553</b>	<b>541</b>
Spain	<b>476</b>	<b>504</b>	<b>494</b>	<b>517</b>
Sweden	503	516	519	533
Switzerland	558	555	539	532
Turkey	397	437	<b>415</b>	<b>446</b>
United Kingdom	<b>491</b>	<b>510</b>	<b>506</b>	<b>518</b>
United States	487	485	527	517

\* French and German-speaking Communities.

Notes: Values that are statistically significant (difference between students expecting to become teachers and students expecting to become professionals) are indicated in bold (see Annex A).

Professionals include scientists, engineers, medical professionals, teachers, and business, legal, social science and related professionals.

Countries are ranked in descending order of the percentage of 15-year-old students who expect to be working in the teaching profession when they are 30 years old.

Source: OECD PISA 2015 Database, Tables 4.1 and 4.2.

StatLink <http://dx.doi.org/10.1787/888933740839>



Figure 4.4 [2/2] ■ **Mathematics and reading performance among students who expect to work as teachers**

Partners	Mean score in mathematics among students who expect to become...		Mean score in reading among students who expect to become...	
	Teachers	Other professionals	Teachers	Other professionals
Algeria	352	372	347	365
Brazil	354	390	382	427
B-S-J-G (China)	543	565	508	531
Bulgaria	421	476	424	482
CABA (Argentina)	443	459	461	483
Colombia	c	395	c	434
Costa Rica	<b>383</b>	<b>407</b>	<b>402</b>	<b>435</b>
Croatia	475	505	515	534
Dominican Republic	333	333	375	366
FYROM	367	392	349	378
Georgia	375	422	372	427
Hong Kong (China)	558	567	538	546
Indonesia	c	394	c	409
Jordan	375	401	416	435
Kosovo	360	377	357	368
Lebanon	360	421	311	377
Lithuania	475	508	479	509
Macao (China)	549	562	514	527
Malta	490	525	469	496
Moldova	422	452	433	457
Montenegro	419	444	437	463
Peru	327	398	328	412
Qatar	c	427	c	434
Romania	438	477	430	472
Russia	494	508	507	515
Singapore	572	578	545	550
Chinese Taipei	582	577	526	530
Thailand	415	444	413	446
Trinidad and Tobago	407	446	430	460
Tunisia	350	388	347	387
United Arab Emirates	385	447	411	458
Uruguay	400	441	434	468
Viet Nam	478	512	476	503

**Notes:** Values that are statistically significant (difference between students expecting to become teachers and students expecting to become professionals) are indicated in bold (see Annex A).

Professionals include scientists, engineers, medical professionals, teachers, and business, legal, social science and related professionals.

Countries are ranked in descending order of the percentage of 15-year-old students who expect to be working in the teaching profession when they are 30 years old.

**Source:** OECD PISA 2015 Database, Tables 4.1 and 4.2.

**StatLink**  <http://dx.doi.org/10.1787/888933740839>

PISA 2015 reveals that just as occupations are segregated along gender lines, so are students' career expectations. The share of girls who expected to work in computing and engineering was far smaller than the share of boys who expected to work in those fields (OECD, 2016, p. 117<sup>[31]</sup>), but girls outnumbered boys among those who expected to work as teachers. In almost every OECD country, more girls than boys expected to work as teachers. Less than 3% of boys, on average across OECD countries, expected a career in the teaching profession, while almost 6% of girls expected to work as teachers. However, in Belgium (French and German-speaking Communities), CABA (Argentina), Costa Rica, the Dominican Republic, Hong Kong (China), Iceland, Japan, Portugal and Chinese Taipei, there were no gender differences in the proportion of students who expected to work as teachers.



In many countries, recent international migration flows have led to large increases in the number of foreign-born students and of children of foreign-born parents (Donlevy, Meierkord and Rajania, 2016<sup>[5]</sup>; OECD, 2010<sup>[32]</sup>). However, the teaching workforce has remained relatively homogeneous in most countries. For example, across OECD countries, teachers tend to be from a middle-class background and from the majority population (OECD, 2010<sup>[33]</sup>). PISA reveals that this pattern is likely to continue in the future. On average across OECD countries, immigrant students were less likely than non-immigrant students to expect to work as teachers.

The social background of would-be teachers is more varied across countries. On average across OECD countries, about 4% of students expected to work as a teacher, regardless of their parents' level of education (3.7% of students whose parents did not complete high school, 4.3% of students whose parents graduated from high school, and 4.2% of students whose parents completed tertiary education so reported). In 16 countries and economies, however, students whose parents did not complete high school were more likely to expect to work as a teacher than students whose parents completed tertiary education. Large differences in favour of students with low-educated parents are found in Algeria, Israel, Kosovo, Lebanon, Thailand and Viet Nam, in particular. In these countries, a career in teaching might be perceived as a pathway to social mobility; however, this pattern might also reveal a lack of selectivity in teacher education programmes.

Bruns and Luque (2015<sup>[11]</sup>) report how, in a number of Latin American countries, several teacher-education institutions are of low quality: there is virtually no winnowing of teacher candidates at the point of entry into teacher education, teacher education is often subsidised, and academic standards are lower than in other professions. While these features might make teacher-education programmes popular among students whose parents are unfamiliar with tertiary education, many graduates of these programmes do not find jobs as classroom teachers. By contrast, in nine OECD countries – the Czech Republic, Estonia, Finland, Germany, Hungary, Japan, Korea, Latvia and Switzerland – students whose parents completed tertiary education were more likely to expect to work as a teacher than students whose parents had not completed high school.

To investigate which individual background characteristics are most strongly associated with the likelihood that students will expect to work as teachers, logistic regression models that jointly account for multiple background characteristics influencing students' career expectations were estimated for each country. While descriptive statistics illustrate the raw differences in the characteristics of students who expect to work as teachers, logistic regressions estimate the influence of a specific factor, net of other characteristics that are correlated with this factor.

Results confirm that, in a majority of countries, girls were more likely than boys to expect to work as teachers, even after accounting for family background and performance (Table 4.9). Belgium (French and German-speaking Communities), Colombia, Costa Rica, the Dominican Republic, Hong Kong (China), Iceland, Japan, Portugal, Qatar and Chinese Taipei are notable exceptions, since in these countries and economies, boys and girls were equally likely (or unlikely) to expect to work as teachers. Immigrant students were less likely to expect to work as teachers, on average across OECD countries (Table 4.9).



In as many as 20 countries and economies, as well as on average across OECD countries, students from socio-economically disadvantaged families were more likely than students from advantaged families to expect to work as teachers, after accounting for other student characteristics and for performance. In all but one of the remaining countries and economies considered, the family's socio-economic status was not associated with students' expectations of pursuing a teaching career.

Analyses restricted to the subsample of students who expected to work as professionals (Table 4.9) confirm that among these students, and after accounting for their gender and family background, high-achieving students were less likely to expect a teaching career, on average across OECD countries.

### **TEACHERS' SALARIES, SOCIAL STATUS OF THE TEACHING PROFESSION AND EXPECTATIONS OF A TEACHING CAREER: EVIDENCE FROM PISA 2015**

Faced with the difficulty of attracting high-achieving students to teacher-education programmes and concerned by a possible fall in the social standing of the teaching profession over the years, policy makers need to know how to attract more, and more-qualified candidates in particular, to the teaching profession. Self-report surveys often show that current 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 chose a career in teaching and remained in the career (OECD, 2005, pp. 67-69<sub>[6]</sub>).

While intrinsic factors are no doubt important for current teachers, these studies do not explain why other “potential teachers” chose to pursue other 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 (Dolton, 2014<sub>[34]</sub>; Dolton, 2006<sub>[35]</sub>). Several recent studies suggest that teachers' low salaries and low social status might deter academically talented students, students from minority backgrounds, and men from pursuing a career in teaching, as more lucrative and prestigious options are available (Cunningham and Hargreaves, 2007<sub>[36]</sub>; Donlevy, Meierkord and Rajania, 2016<sub>[5]</sub>; Park and Byun, 2015<sub>[37]</sub>).

On average across OECD countries, primary school teachers earn 81% of what a tertiary-educated, 25-64 year-old, full-time, full-year worker earns; lower secondary teachers are paid 85% of that benchmark salary; and upper secondary teachers are paid 89% of that benchmark salary (OECD, 2016<sub>[28]</sub>). Moreover, data from the second cycle of the Teacher and Learning International Survey (TALIS) show that the social status of the teaching profession varies across countries. In 2013-14, TALIS asked teachers to report whether they agreed with the statement “I think that the teaching profession is valued in society”. In Malaysia, about 84% of lower secondary teachers reported that the teaching profession is valued in society, whereas only 4% of lower secondary teachers in the Slovak Republic so reported (see Table 2.16).



To examine the association between students' expectations of a teaching career, teachers' salaries and the social status of the teaching profession, an analysis that relates the likelihood of students expecting a career in teaching to student and school characteristics and to country-level differences in teachers' pay and social status was conducted.<sup>8</sup> Thirty-two countries that participated in both the second cycle of TALIS and in PISA 2015, and for which data on teachers' salaries are available, were included in the analysis.<sup>9</sup>

Two country-level variables in this model are of particular interest: teachers' salaries and the social status of the teaching profession. Teachers' salaries are measured as the ratio of annual statutory salaries in lower secondary public institutions after 15 years of experience to per capita GDP (OECD, 2016, Table II.6.54<sub>[3]</sub>). The social status of the teaching profession is derived from the percentage of teachers in a country who agreed or strongly agreed with the statement that the teaching profession is valued in society (see Table 2.16). Both teachers' salaries and the social status of teaching profession were standardised across countries.

In addition, the analysis also accounts for differences in per capita GDP and in how representative the PISA sample is of all 15-year-olds in the country, and for school- and student-level differences, such as gender, socio-economic status, performance and urban/rural location, which are known to influence students' career choices. The associations between the likelihood of expecting a career in teaching, and these school- and student-level factors, are in line with the average results from country-specific analyses reported in Table 4.9.

At the country level, results indicate that both teachers' salaries and the social status of the teaching profession are positively associated with students' expectations to work as teachers (Table 4.10). In countries where teachers' salaries are higher, 15-year-old students were more likely to expect to work as teachers (Model 1). Likewise, in countries where more teachers think that the teaching profession is valued in their society, 15-year-old students were more likely to expect to work as teachers (Model 2). When teachers' salaries and the social status of the teaching profession are jointly introduced in the model, the latter association is positive but no longer statistically significant at the 5% level, indicating that the association with teachers' salaries is stronger (Model 3). These results suggest that more candidates can be attracted to teaching if teachers are better paid.

Next, analyses were developed to examine what kinds of candidates, in particular, are sensitive to differences in social status and in salaries. These analyses investigate whether teachers' salaries and the social status of the teaching profession are related in different ways to students' expectations of a teaching career, depending on the students' academic proficiency and certain characteristics, namely gender, socio-economic status, immigrant background and mathematics performance. Results indicate that boys were more sensitive to salary differences, but that there is no evidence that higher salaries would attract high-achieving students into the teaching profession to a greater extent than low-achieving students.

In countries where teachers' salaries are higher, both boys and girls were more likely to expect to work as teachers. However, girls appeared to be less sensitive to teachers' salaries than boys, and students' expectations of a teaching career were more gender-balanced in countries with higher teachers' salaries (Table 4.10, Models 1a and 3a). Teachers' salaries are positively associated



with students' expectations to work as teachers across all levels of student performance, with no significant variation between high and low performers (Table 4.10, Models 1d and 3d). Similarly, cross-country differences in teachers' salaries are not related to within-country gaps in students' expectations of a teaching career between socio-economically advantaged students and disadvantaged students, and between immigrant students and non-immigrant students; nor can the social status of the teaching profession account for such gaps (Table 4.10, Models 1-3b and 1-3c).

### WHO EXPECTS TO BECOME A TEACHER? TRENDS BETWEEN 2006 AND 2015

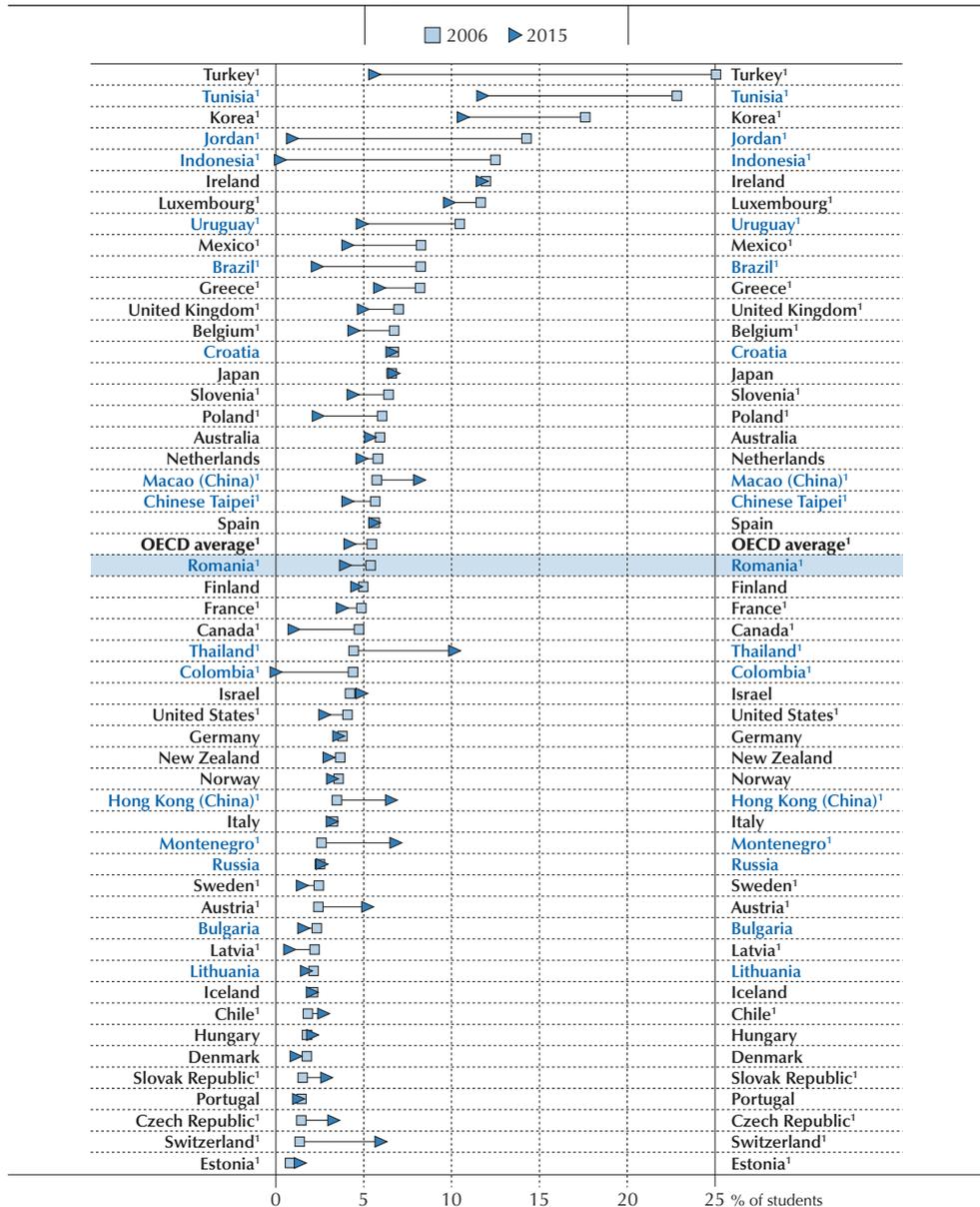
On average, about 5.5% of students in PISA 2006 expected to work as teachers, whereas about 4.2% of students in PISA 2015 held similar expectations (Figure 4.5). However, there are substantial between-country differences in the way the percentage of students expecting to become teachers has changed over time. In 10 countries and economies, significant increases in the percentage of students who expected to work as teachers were observed between 2006 and 2015. Thailand shows the largest increase in this share of students (an increase of about six percentage points during the period), followed by Switzerland, Montenegro, Hong Kong (China), Austria and Macao (China), all with increases of between two and four percentage points. The share of students who expected to pursue a career in teaching also increased in Chile, the Czech Republic, Estonia and the Slovak Republic, but by less than two percentage points.

By contrast, in 22 countries/economies, there was downward trend in the share of students who expected a teaching career. Turkey shows the largest drop – by 19 percentage points – followed by Jordan, Indonesia and Tunisia (with decreases of between 10 and 14 percentage points). The declines in Turkey, Jordan and Indonesia might be related to the large increases in secondary enrolment rates, and in the share of 15-year-olds represented in the PISA population (OECD, 2016, Table I.6.1<sub>[31]</sub>). On the one hand, the high demand for teachers that this implied might have contributed to the large shares of students who expected a career as teachers in the past. On the other hand, the increase in the overall number of 15-year-old students means that the number of students who expected a career in teaching declined less sharply than the share of students who expected so.

Trend comparisons indicate that, in the majority of countries, changes in the academic performance of students who reported that they expect to work as teachers were similar to those of students who expected to pursue a career other than teaching. However, in seven countries, as well as on average across OECD countries, the reading and mathematics scores of students who reported that they expect to work as teachers improved less – or declined faster – than those of students with different career expectations, resulting in a less academically select pool of teacher candidates: Croatia, Finland, Germany, Ireland, the Netherlands, Spain and the United Kingdom (the same negative trend was observed in Luxembourg and Montenegro for mathematics scores only, and in France and Latvia for reading scores only [Table 4.4]).

On average across countries, reductions in the share of students who expected to work as teachers coincided with improvements in the relative performance of the students who held such expectations. There is a negative correlation between changes in the share of students with expectations of a career in teaching and changes in the performance premium in mathematics between these students and students with other career expectations ( $r = -0.23$  across 50 countries and economies with valid data;  $r = -0.30$  after excluding Turkey, an outlier).

Figure 4.5 ■ **Change between 2006 and 2015 in the percentage of students who expect to work as teachers**



1. Countries/economies in which the change between 2006 and 2015 is statistically significant.

Countries and economies are ranked in descending order of the percentage of 15-year-old students, in 2006, who expect to be working as teachers when they are 30 years old.

Source: OECD PISA 2015 Database, Table 4.4.

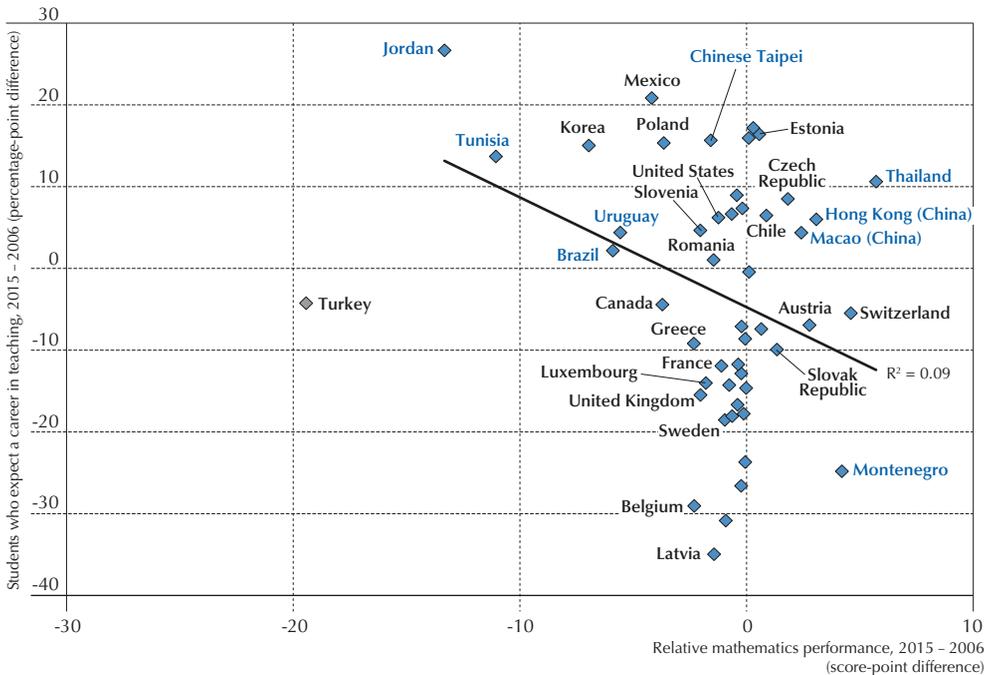
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This could mean that expectations of a career in teaching among academically weaker students are more volatile, and perhaps more sensitive to changes in teachers' compensation and working conditions, than those of academically stronger students (Figure 4.6).

Figure 4.6 ■ **Change between 2006 and 2015 in expectations of a teaching career and students' relative performance in mathematics**

*How changes in the score-point difference between students who expect a teaching career and students with other career expectations relate to changes in the percentage of students who expect a teaching career (PISA 2015 – PISA 2006)*



**Notes:** Countries/economies named on the chart show a significant change in the percentage of students who expect a career as teachers between 2006 and 2015. Countries/economies where the increase or decrease is not significant are Australia, Bulgaria, Croatia, Denmark, Finland, Germany, Hungary, Iceland, Ireland, Israel, Italy, Japan, Lithuania, the Netherlands, New Zealand, Norway, Portugal, the Russian Federation and Spain.

The line indicates the linear relationship observed between the relative mathematics performance of students who expected a teaching career and the share of such students in each country/economy. The data for Turkey are not used to estimate this relationship.

**Source:** OECD PISA 2015 Database, Table 4.4.

**StatLink**  <http://dx.doi.org/10.1787/888933740877>

In Bulgaria, Canada, Indonesia, Montenegro, Switzerland and Uruguay, the proportion of girls among students who expected a career in teaching increased significantly between 2006 and 2015. In contrast, in Hong Kong (China), the Netherlands, Portugal, Spain, Chinese Taipei and the United Kingdom, the group of students who expected a career in teaching became more



masculine over the period (Table 4.4). No correlation is observed between the overall change in the share of students who expected a career in teaching and the change in the share of girls among this group of students. This means that, in general, the expectations of boys and girls evolved in similar directions, and with similar intensity, over the period.

### WHAT FACTORS EXPLAIN TRENDS BETWEEN 2006 AND 2015?

Were there country-specific changes in teachers' working conditions that could explain trends in students' expectations to become teachers? In order to examine this, country-level changes in students' expectations to pursue a teaching career were related to changes in the ratio of students to teaching staff and in teachers' salaries. Salary changes were measured both in real and in relative terms, i.e. adjusted for inflation (in real terms) and compared to the average income growth across the economy, as measured by per capita GDP levels (in relative terms).<sup>10</sup>

Results reveal that changes in teachers' relative salaries are positively associated with changes in students' expectations of a teaching career overall. In other words, 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 expected to work as teachers; in countries where teachers' salaries did not keep up with overall GDP growth – as was the case in Korea and Turkey – this percentage decreased, on average ( $r = 0.43$ , across 24 OECD countries). However, the relative performance of students who expected to work as teachers decreased, on average, in countries where teachers' salaries increased more rapidly than GDP growth ( $r = -0.50$  for mathematics) (Figure 4.7).

Both PISA 2015 analyses (Table 4.10) and trends analyses (Figure 4.7) therefore suggest that increases in teachers' salaries might not be enough to attract more high-achieving students to the teaching profession.

In contrast, reductions in the number of students per teacher, in schools attended by 15-year-olds, are unrelated to the overall share of students who expected a career in teaching, but are associated with better relative mathematics performance among students who expected a career in teaching, even though the association is weak ( $r = -.31$  across 47 countries/economies) (Figure 4.8). To the extent that lower student-teacher ratios signal better working conditions – e.g. less instruction time and smaller classes – this might suggest that high-performing students are more sensitive to their teachers' working conditions, when deciding whether to pursue a career in teaching, than to monetary compensation.

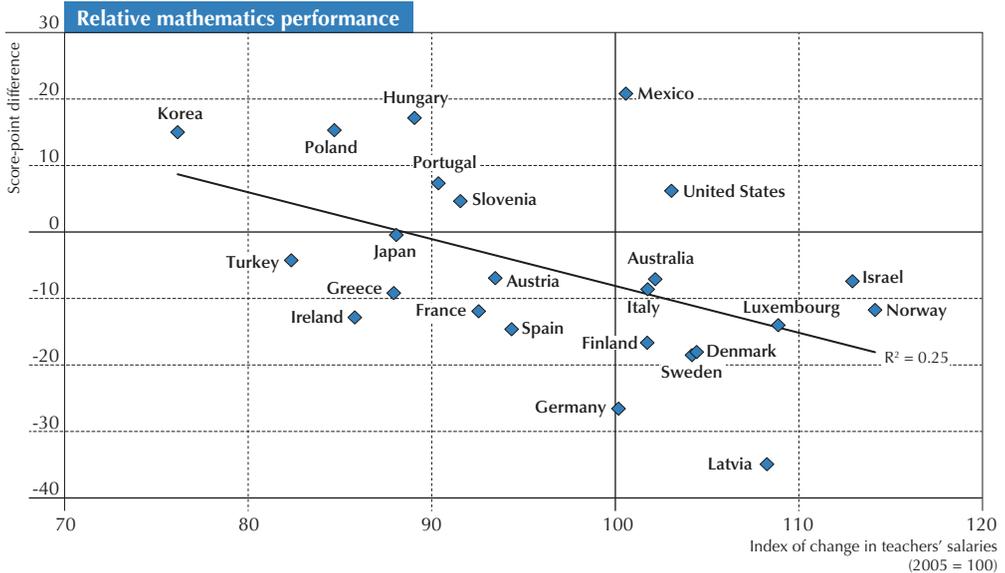
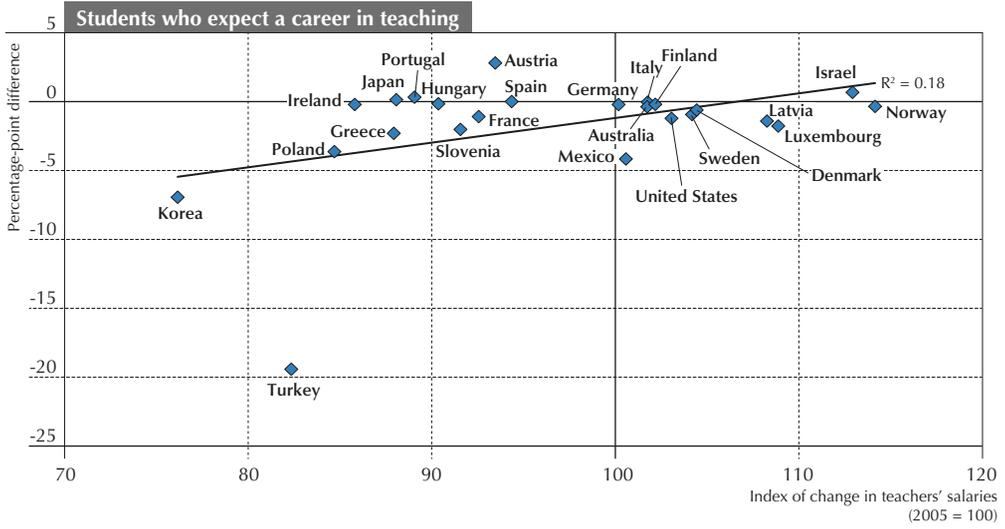
### CONCLUSION

Attracting high-achieving and highly motivated candidates to the teaching profession is a top priority in many countries. The quality of the teaching force has been shown to be more important than any other aspect of schooling in predicting students' academic outcomes (Nye, Konstantopoulos and Hedges, 2004<sup>[38]</sup>; Rivkin, Hanushek and Kain, 2005<sup>[39]</sup>). But the analysis in this chapter shows that only a few – and mostly high-performing – countries are able to attract top-of-the class students into teaching.



Figure 4.7 ■ **Change between 2006 and 2015 in teachers' relative salaries and students' expectations of a teaching career**

*How changes in teachers' salaries after 15 years of experience relative to GDP (2005 to 2015) relate to changes in the percentage of students who expect a teaching career and to changes in the score-point difference between students who expect a teaching career and students with other career expectations (PISA 2015 – PISA 2006)*

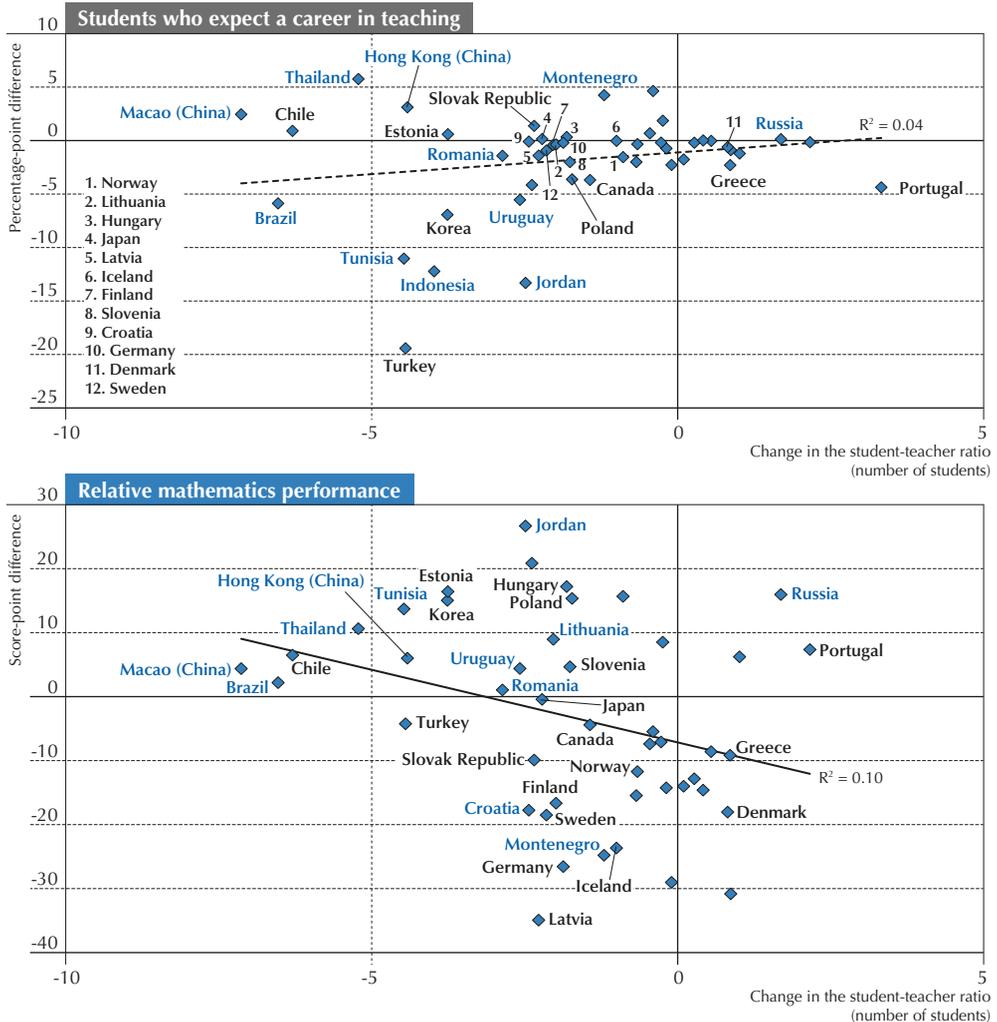


Source: OECD PISA 2015 Database, Tables 2.14 and 4.4.  
 StatLink <http://dx.doi.org/10.1787/888933740896>



Figure 4.8 ■ **Change between 2006 and 2015 in student-teacher ratios and students' expectations of a teaching career**

*How changes in the average student-teacher ratio in schools attended by 15-year-olds relate to changes in the percentage of students who expect a teaching career and to changes in the score-point difference between students who expect a teaching career and students with other career expectations (PISA 2015 – PISA 2006)*



**Notes:** Countries/economies named on the charts show significant changes in the average student-teacher ratio in schools attended by 15-year-olds between 2006 and 2015. Countries and economies included in this chart with non-significant changes in the student-teacher ratio are: Australia, Belgium, Bulgaria, Colombia, the Czech Republic, Ireland, Israel, Italy, Luxembourg, Mexico, the Netherlands, Spain, Switzerland, Chinese Taipei, the United Kingdom and the United States. The dotted line indicates a non-significant relationship.

**Source:** OECD PISA 2015 Database, Tables 2.1 and 4.4.

**StatLink** <http://dx.doi.org/10.1787/888933740915>



Recently, concerns about the demographic composition of the teaching profession have also emerged. Male teachers, and teachers with a migrant background, are generally under-represented compared to the actual diversity of students (OECD, 2005, p. 59<sup>[6]</sup>; Donlevy, Meierkord and Rajania, 2016<sup>[5]</sup>). This is a critical issue because teachers from minority backgrounds can serve as role models for students from the same, or other, minority backgrounds (Zirkel, 2002<sup>[40]</sup>), as well as for all students (King, 1993<sup>[41]</sup>). These teachers can also apply their understanding of minority students' cultural backgrounds and experiences to their work (Warikoo, 2004<sup>[42]</sup>). The literature also indicates that assignment to a same-gender teacher can significantly improve achievement, and influences teachers' perceptions of their students' performance and students' engagement with their teacher's subject (Lim and Meer, 2017<sup>[43]</sup>; Dee, 2005<sup>[44]</sup>; Dee, 2007<sup>[45]</sup>).

Despite the suggested benefits of diversity in the teaching workforce, analyses reported in this chapter suggest that the teaching force in elementary and secondary schools is likely to remain homogeneous in the future.

Several studies suggest that salary increases and better working conditions would attract more high-skilled teacher candidates and candidates from diverse backgrounds (Guarino, Santibañez and Daley, 2006<sup>[46]</sup>; Leigh, 2012<sup>[47]</sup>). However, results presented in this chapter suggest that extrinsic economic incentives alone are not sufficient, and might even prove more attractive to low-achieving students (whose career decisions appears more sensitive to salary levels) than to high-achieving students.

These results are in line with evidence emerging from previous analyses based on PISA 2006. Han, Borgonovi and Guerriero (2017<sup>[48]</sup>) found that in countries with higher teachers' salaries, students are more likely to expect to work as teachers; but the positive association between teachers' salaries and students' expectations of a teaching career differs depending on students' performance in mathematics. They found that teachers' salaries were not associated with high-achieving students' expectations to pursue a teaching career, whereas higher teachers' salaries were associated with middle- and low-achieving students' expectations to become a teacher.

In contrast, this chapter suggests that high-performing students are at least as sensitive as low-achieving students to other characteristics of teaching – such as student-teacher ratios and whether teachers reported that the teaching profession is valued in society. Thus, policy makers should consider a wide range of qualitative improvements to teachers' working conditions to make teaching careers more attractive to high-achieving students. At the same time, they could perhaps increase the level of professional autonomy and responsibility, the opportunities for personal and intellectual growth, and the possibilities of career progression that teachers enjoy – and make students more aware of these aspects of the “job description”, in order to help make teaching a more attractive option for high-achieving students in particular. Sahlberg (2010<sup>[22]</sup>) suggests that one of the main reasons why teaching attracts high-performing students in Finland is the (accurate) perception of the profession as providing high levels of autonomy and intellectual challenge. Policy makers might also consider more direct ways of attracting the most talented students into teaching, e.g. with merit-based scholarships or targeted subsidies, as exist in Shanghai (Darling-Hammond et al., 2017<sup>[49]</sup>) and as have been introduced, since 2010, in Chile (Bruns and Luque, 2015, pp. 26-27<sup>[1]</sup>; Ministerio de Educación, 2018<sup>[50]</sup>).



Results suggest that higher teachers' salaries might reduce gender imbalances in the teaching profession, but only marginally. Targeted policies, such as communications and media campaigns, outreach efforts, and flexible pathways to enter the teaching profession for individuals with unconventional backgrounds, such as those offered through the "Teach for All" network,<sup>11</sup> are likely to be more cost-effective.



## Notes

1. Data from the Teaching and Learning International Survey (TALIS) 2013 are used for this analysis, together with data on teachers' salaries from the OECD *Education at a Glance* database, which was extended, for partner countries and economies, through a special system-level data collection conducted in collaboration with PISA Governing Board members and National Project Managers (OECD, 2016, Table II.6.54<sup>[31]</sup>).
2. Both PISA 2006 and 2015 questionnaires included a single open-ended question about students' career expectations. The PISA 2006 dataset used the ISCO-88 classification, while the PISA 2015 used the ISCO-08 classification. Although the ISCO-88 and ISCO-08 classifications differ, the International Labour Organization (ILO) has developed conversion matrices that make it possible to align the ISCO-88 occupational categories with the more recent ISCO-08 categories. Data on changes in teachers' salaries (adjusted for inflation) are available for 24 OECD countries only, and are based on the *Education at a Glance* database (see Table 2.14). Data on class size and the ratio of students to teaching staff are based on principals' reports to the PISA school questionnaire, and refer to language-of-instruction classes for the modal grade attended by 15-year-olds, and to student-teacher ratios in schools attended by 15-year-olds, respectively (see Tables 2.1 and 2.7).
3. The British Cohort Study of 1970, an ongoing study that follows individuals born in 1970, asked participants at age 16 – i.e. in 1986 – about their occupational interests and aspirations. These can be compared to their actual careers as observed in later follow-up surveys.
4. In order to compute shares of teachers for this analysis, teacher weights were generated so that the sum of teacher weights within each school is equal to the sum of student weights within the same school. All science teachers within a school have the same weight, as do all non-science teachers within a school. Data for science and non-science teachers are analysed separately, as these define two distinct and non-overlapping populations for sampling. The text reports the average percentage of teachers – both science and non-science teachers – who had chosen to pursue a teaching career by the end of secondary school.
5. Information on teacher shortages in mathematics and science was not collected in PISA 2015.
6. Source: <http://databank.worldbank.org/data/reports.aspx?source=Education-Statistics---All-Indicators#>, accessed 15 December 2017.
7. Also see Chapter 2.
8. Three-level models, with students (level 1) nested within schools (level 2) and within countries (level 3), were estimated. Because the dependent variable is binary, this chapter uses hierarchical generalised linear models (HGLMs) in which the level 1 sampling model is a Bernoulli distribution (Raudenbush and Bryk, 2002<sup>[52]</sup>). The country weight factor for normalised weights (multilevel analysis), CNTFAC, was used to ensure that each country contributes equally to the analysis (OECD, 2009<sup>[51]</sup>).
9. Thirty-six countries/economies participated in both surveys; however, data on statutory teachers' salaries are not available for England (United Kingdom) the Russian Federation and Shanghai (China), which were therefore not included in the analysis. Belgium is also not included, as only the Flemish Community participated in TALIS, but only the French and German-speaking communities collected data on students' career expectations. TALIS data for Canada and the United Arab Emirates refer to the province of Alberta and the Emirate of Abu Dhabi only.
10. Data on changes in teachers' salaries between 2005 and 2015 are available in Table 2.14 for 24 OECD countries. Data on per capita GDP growth between 2005 and 2015 (adjusted for inflation) were downloaded from the OECD Annual National Accounts database (<http://stats.oecd.org>, accessed 18 December 2017).
11. <https://teachforall.org/>; accessed 15 February 2018.



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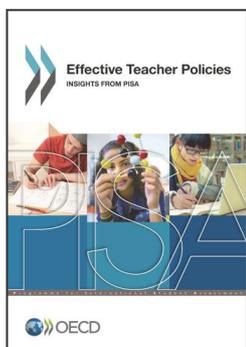
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**From:**  
**Effective Teacher Policies**  
Insights from PISA

**Access the complete publication at:**  
<https://doi.org/10.1787/9789264301603-en>

**Please cite this chapter as:**

OECD (2018), “Who aspires to a career in teaching?”, in *Effective Teacher Policies: Insights from PISA*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264301603-7-en>

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