In which countries do the most highly qualified and experienced teachers teach in the most difficult schools?

PISA in Focus #85

OECD
BETTER POLICIES FOR BETTER LIVES

In which countries do the most highly qualified and experienced teachers teach in the most difficult schools?

- In 2015, a majority of countries and economies that participated in PISA compensated disadvantaged schools with smaller classes and/or lower student-teacher ratios. However, in more than a third of countries and economies, teachers in the most disadvantaged schools were less qualified or less experienced than those in the most advantaged schools.
- Gaps in student performance related to socio-economic status were wider in countries where socio-economically disadvantaged schools employed fewer qualified and experienced teachers than advantaged schools.
- Greater school autonomy for managing teachers is associated with more equitable sorting of teachers across schools.

Teachers are the most important school resource. In every country, teachers' salaries and training represent the greatest share of expenditure on education; and this investment in teachers can have significant returns. Research shows that being taught by the best teachers can make a real difference in the learning and life outcomes of otherwise similar students.

But not all students are equal when it comes to access to high-quality teaching. In fact, PISA data show that there are inequities in access to experienced and qualified teachers in many countries, and that they are related to the gap in learning outcomes between advantaged and disadvantaged students.

More is not necessarily better.

An analysis of PISA 2015 data ranked all lower-secondary schools or upper-secondary schools (depending on the typical school level attended by 15-year-olds) by their socio-economic profile – that is, the average socio-economic status of 15-year-old students attending the school. From this ranking, four groups of schools were created in each country, with each group having approximately 25% of all 15-year-old students. The group of schools with the lowest average socio-economic profile represents socio-economically disadvantaged schools; the group of students with the highest socio-economic profile represents advantaged schools. The analysis then compared class size, student-teacher ratios, teachers' credentials and, in countries that collected this information, teachers' experience, between advantaged and disadvantaged schools.

Results clearly show that a majority of countries and economies that participated in PISA 2015 compensate disadvantaged schools with smaller classes and/or lower student-teacher ratios; this is particularly true when analyses are restricted to public and government-dependent private schools. However, in more than a third of countries and economies, including many that compensate disadvantaged schools with more teachers, teachers in the most disadvantaged schools are less qualified and/or less experienced than teachers in the most advantaged schools.

The size of language-of-instruction classes is smaller in disadvantaged schools than in advantaged schools in 38 out of 69 countries and economies participating in PISA, including Canada, France, Germany, Japan, Korea, Mexico, the Netherlands and Poland. Meanwhile, even if class size is not significantly different in disadvantaged schools compared to advantaged schools, Denmark, Ireland, Italy, Spain, and public and government-dependent private schools in the United States compensate disadvantaged schools with more teachers per student.

But far fewer education systems ensure that more qualified teachers or a greater share of fully certified teachers are found in disadvantaged schools. In fact, the opposite is often observed. In France, Italy and the Netherlands, and in 16 out of 66 countries/economies, teachers in the most disadvantaged schools are less likely to be fully certified than teachers in advantaged

Difference between advantaged and disadvantaged schools in teacher resources

Results based on principals' reports

		ALL SCHOOLS				PUBLIC SCHOOLS AND GOVERNMENT-DEPENDENT PRIVATE SCHOOLS			
		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 (%)
OECD	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
Partners	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	39	34	3	4
Education systems with no difference		28	41	42	46	28	33	43	47
Education systems where advantaged schools are worse off		3	4	23	16	1	1	20	14

Missing values

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

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

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

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

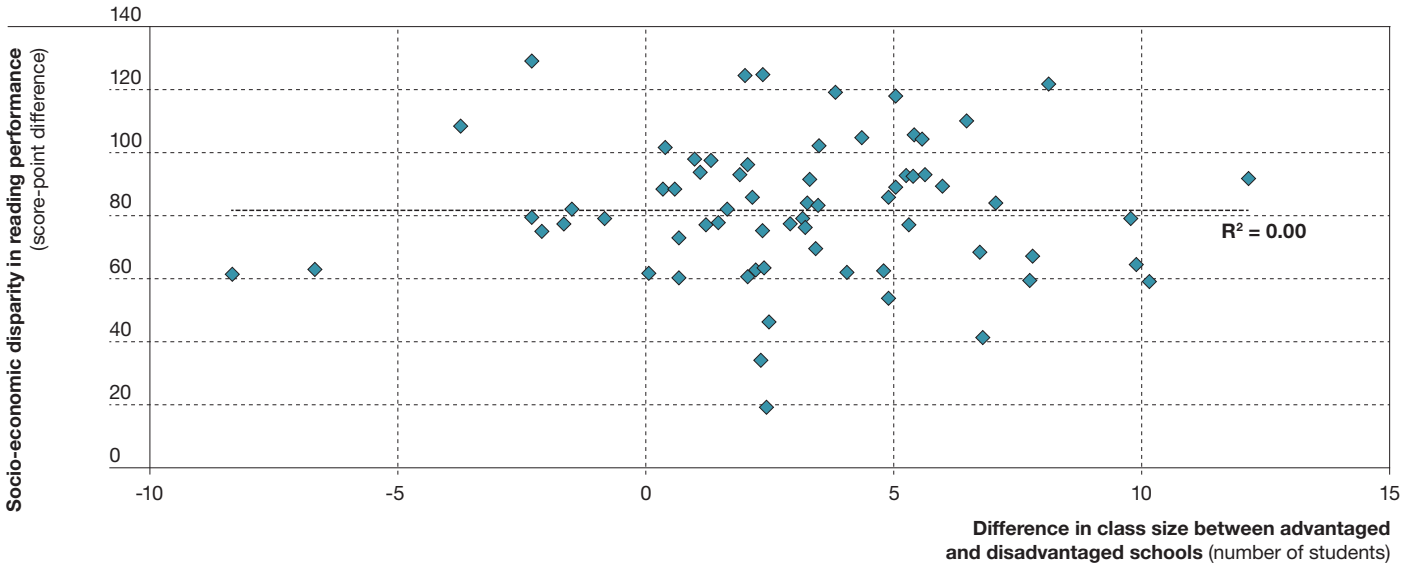
Notes: Differences in class size of fewer than two students and of student-teacher ratios of fewer than one student are not reported as significant; differences in proportions of science teachers with a major in science and of fully certified teachers of less than four percentage points are not reported 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 (2018), *Effective Teacher Policies: Insights from PISA,* Figure 1.2.

Relationship between socio-economic differences in reading performance and in class size

Difference in reading performance between students in the top quarter and students in the bottom quarter of socio-economic status and average difference between advantaged and disadvantaged schools in the size of language-of-instruction classes



Notes: The dotted line indicates a non-significant relationship.

Source: OECD (2018), *Effective Teacher Policies: Insights from PISA,* Table 3.1; OECD (2016), *PISA 2015 Results (Volume I): Excellence and Equity in Education,* Table I.6.3b, http://dx.doi.org/10.1787/888933433214.

schools; a similar gap is observed between advantaged and disadvantaged public schools in the United States. In Australia, Mexico and the United Kingdom, and in 23 out of 67 countries/economies, science teachers in the most disadvantaged schools are less likely to have a university degree with a major in science compared to science teachers in advantaged schools. In countries that surveyed teachers as part of PISA 2015, similar gaps – to the detriment of disadvantaged schools – are also found for other teacher characteristics that correlate with teacher quality, such as the proportion of teachers with more than five years of experience, or the proportion of teachers on short-term temporary contracts.

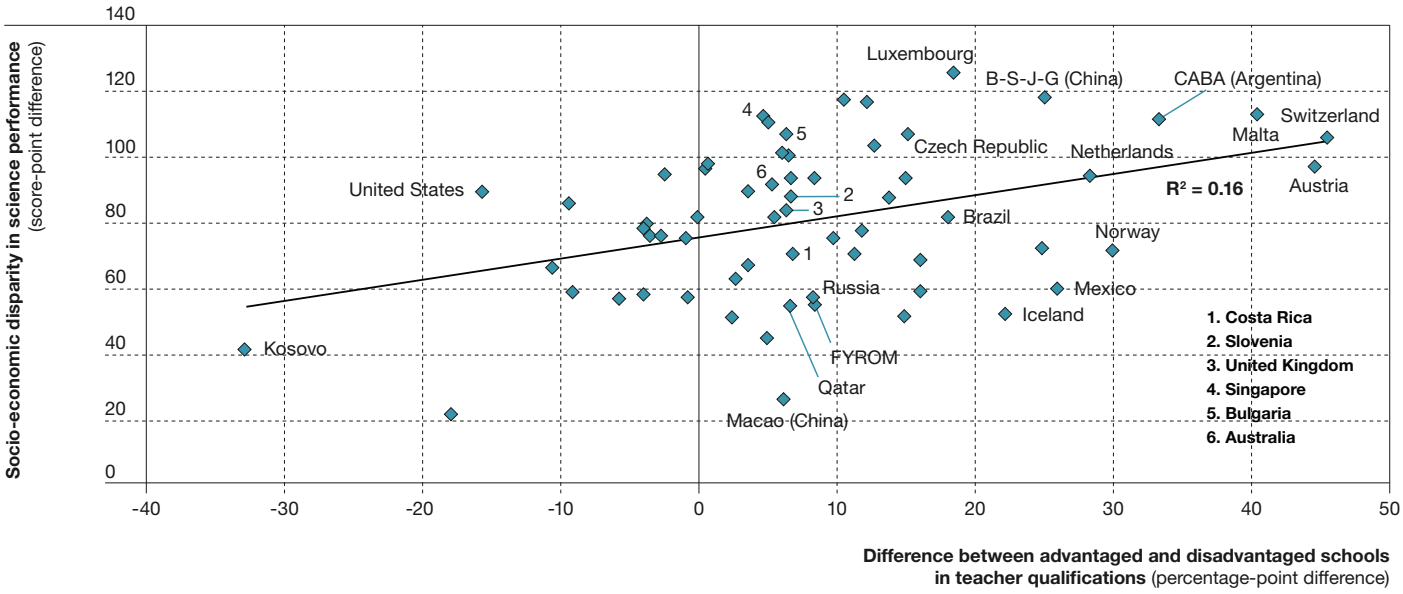
Education should strive to ameliorate, not exacerbate, economic and social inequities.

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. At the same time, countries that compensate for disadvantage in schools with smaller classes and lower student-teacher ratios do not, on average, have narrower performance gaps related to socio-economic status. That may be because such quantitative compensations do not translate into higher-quality teachers and teaching. This suggests that it is not sufficient, and perhaps not necessary, for the most disadvantaged schools to have more teachers, as long as these schools are able to attract the most talented and effective teachers.

Opponents to school autonomy often argue that greater independence of schools might lead to larger disparities in student performance and, perhaps more worryingly, to an education system that exacerbates, rather than ameliorates, existing economic and social inequities. But PISA data suggest that this is not the most common result of greater school autonomy.

Relationship between socio-economic differences in science performance and in teacher qualifications

Difference in science performance between students in the top quarter and students in the bottom quarter of socio-economic status and average difference between advantaged and disadvantaged schools in the proportion of science teachers with a major in science



Note: Countries on the chart show a significant difference between advantaged and disadvantaged schools in the proportion of science teachers with a major in science. Countries/economies where the difference is not significant are Albania, Algeria, Belgium, Canada, Chile, Colombia, Denmark, the Dominican Republic, Estonia, Finland, France, Georgia, Germany, Greece, Hong Kong (China), Hungary, Indonesia, Ireland, Israel, Jordan, Korea, Latvia, Lebanon, Lithuania, Moldova, Montenegro, New Zealand, Peru, Poland, Portugal, Romania, the Slovak Republic, Spain, Sweden, Chinese Taipei, Thailand, Trinidad and Tobago, Tunisia, Turkey, the United Arab Emirates, Uruguay and Viet Nam.

OECD (2018), *Effective Teacher Policies: Insights from PISA,* Table 3.11; OECD (2016), *PISA 2015 Results (Volume I): Excellence and Equity in Education,* Table I.6.3a, http://dx.doi.org/10.1787/888933433214.

Many countries have been able to combine extensive autonomy of schools with strong incentives to ensure that schools prioritise student learning over other considerations, and with compensatory funding mechanisms to ensure that equity is not jeopardised. Ireland provides an interesting example. While most Irish schools are private, the government provides almost all funding; and the schools with the highest concentrations of pupils from disadvantaged backgrounds receive significantly more funds and are given priority access to government-led education programmes, including teacher-training programmes. Perhaps as a result, the most disadvantaged schools not only have smaller student-teacher ratios compared to advantaged schools, but also have teachers who are at least as qualified as those in advantaged schools.

The bottom line

Most countries can do more to oversee how teachers are allocated to schools: they should not only monitor the number of teachers, but also keep a close eye on their qualifications, experience and effectiveness. Any teacher policy that aims to tackle student disadvantage should strive to allocate high-quality teachers, and not just more teachers, to underprivileged students.

For more information

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See: OECD (2018), Effective Teacher Policies: Insights from PISA, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264301603-en.

Coming next month: How is participation in sports related to students' performance and well-being?

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