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chapter 2

IMPROVING BOTH QUALITY AND EQUITY: INSIGHTS FROM PISA 2000

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SUMMARY

The OECD Programme for International Student Assessment (PISA) produced the results of its first international survey of 15-year-olds in 2001. As well as describing considerable differences in student performance across and within countries, the results start to give valuable insights relevant for the formulation of educational policy. In particular, the analyses in this chapter suggest that:

- Quality and equity do not have to be seen as competing policy objectives. A number of countries achieved high overall performance standards alongside a relatively narrow distribution of student results.
- While spending on schools is important for the provision of high-quality schooling, spending alone does not guarantee better outcomes. Some countries achieved high performance with relatively limited resources, and vice versa.
- Building student engagement with reading, and with school more generally, may help lift overall performance and reduce the influence of coming from a relatively disadvantaged home background. Strikingly, being more enthusiastic about reading and a frequent reader was more of an advantage, on its own, than having well-educated parents in good jobs.
- School practices appear to make a difference: students tend to perform better in schools characterised by high expectations, the enjoyment of learning, a strong disciplinary climate, and good teacher-student relations.
- Countries that combine a clear focus on student performance with greater levels of school autonomy tend to perform better on average, and greater school autonomy is not necessarily associated with larger variation in school performance.
- Overall performance appears to be higher, and variation among students narrower, in systems with a lesser degree of differentiation between different types of schools.

1. INTRODUCTION

How well do school systems perform in providing all young people with a solid foundation of knowledge and skills, and in preparing them for life and learning beyond school? Parents, students, the public and those who manage education systems need to know the answers to such questions.

Many national education systems regularly monitor the outcomes of student learning, with methods ranging from broad assessments of samples of students up to high-stakes individual and subject-specific examinations. Comparative international analyses

can extend and enrich the picture by providing a larger context within which to interpret national results. They can show countries their areas of relative strength and weakness, and help them to monitor progress and raise aspirations. They can also provide directions for national policy, for schools' curriculum and instructional efforts, and for students' learning.

Since 1997, the OECD Member countries have been building on earlier international work to establish a comparative framework to assess how well their school systems meet core objectives. The result is the OECD Programme for International Student Assessment (PISA), the most comprehensive exercise to date

Box 2.1 PISA 2000 – an internationally standardised assessment of 15-year-olds

Sample size

More than a quarter of a million students, representing almost 17 million 15-year-olds enrolled in the schools of the 32 participating countries, were assessed in 2000. Another 13 countries are administering the same assessment during 2002.

Content

- PISA 2000 covered three “domains”: reading literacy; mathematical literacy; and scientific literacy. In this first survey the main focus was on reading literacy.
- PISA 2000 looked at young people’s ability to use their knowledge and skills in order to meet real-life challenges, rather than how well they had mastered a specific school curriculum. The emphasis was on the mastery of processes, the understanding of concepts, and their application to solving problems.

Methods

- Pencil-and-paper assessments, lasting two hours for each student.
- A combination of multiple-choice questions and questions that required students to construct their own answers. Questions were typically organised in units based on a passage describing a real-life situation.
- A total of seven hours of assessment items was included, with different students taking different combinations of the assessment items in their two hours.
- Students answered a background questionnaire that took about 30 minutes to complete and, in 25 countries, completed questionnaires on learning and study practices as well as familiarity with computers.
- School principals completed a questionnaire about their school.
- An important limitation of PISA 2000 is that no information was collected from teachers. Such data are difficult to collect and interpret as students in the PISA samples are generally taught by a number of different teachers. The issue of collecting data from teachers is under continuing investigation.

Future assessments

PISA will continue in three-year cycles. In 2003, the main focus will be on mathematics, and in 2006 on science. The assessment of cross-curricular competencies is being progressively integrated into PISA, beginning with an assessment of problem-solving skills in 2003.

Further information

Details on the design of PISA 2000 and the international results are provided in *Knowledge and Skills for Life – First Results from PISA 2000* (OECD, 2001a). Further information is available from www.pisa.oecd.org

aimed at the assessment of learning outcomes within an international comparative perspective. Box 2.1 provides an overview of the first PISA survey of student knowledge and skills, which took place in 2000.

This chapter explores some of the factors that the PISA 2000 results suggest are associated with high quality learning outcomes. It begins by briefly summarising the performance of countries in the PISA assessment, both in terms of the knowledge and skills which 15-year-olds display in key areas, and the extent to which education systems deliver equitable learning outcomes. The chapter then investigates characteristics of schools and school systems that are associated with strong and equitable performance. In particular, it seeks to identify those characteristics that policy makers can do something about.

2. EVIDENCE ON THE QUALITY AND EQUITY OF STUDENT PERFORMANCE

2.1 Performance levels among 15-year-olds

First results from PISA 2000 were published in 2001, showing how well 15-year-olds in OECD and

other countries can apply knowledge and skills in key subject areas. The results revealed wide differences not just among countries, but also among schools and students within countries.¹

Box 2.2 summarises the five levels of reading literacy proficiency developed in PISA 2000. In Australia, Canada, Finland, New Zealand and the United Kingdom, more than 15% of students displayed the highest level of reading proficiency (Level 5), showing that they are capable of completing sophisticated reading tasks (see Figure 2.1). By contrast, this proportion was 5% or less in Brazil, Greece, Latvia, Luxembourg, Mexico, Portugal, the Russian Federation and Spain.

Students with literacy skills at or below Level 1 may not only encounter difficulties in their initial transition from education to work, but may also fail to benefit fully from further education and learning opportunities throughout life. In Finland and Korea, only around 5% of students perform at Level 1, and less than 2% below it, but these countries are exceptions. In all of the other countries 10% or more of students perform at or below Level 1.

Box 2.2 Reading literacy proficiency levels in PISA 2000

Level 5 (over 625 points): students are capable of sophisticated reading tasks, such as: managing information that is difficult to find in unfamiliar texts; showing detailed understanding and inferring which information is relevant to the task; being able to evaluate critically and build hypotheses; drawing on specialised knowledge; and accommodating concepts that may be contrary to expectations.

Level 4 (553 to 625 points): students are capable of difficult reading tasks, such as locating embedded information, construing meaning from nuances of language, and critically evaluating a text.

Level 3 (481-552 points): students are capable of reading tasks of moderate complexity, such as locating multiple pieces of information, drawing links between different parts of the text, and relating it to everyday knowledge.

Level 2 (408-480 points): students are capable of basic reading tasks, such as locating straightforward information, making low-level inferences of various types, deciding what a well-defined part of the text means, and using some outside knowledge to understand it.

Level 1 (335-407 points): students are capable of only the least complex reading tasks, such as locating a single piece of information, identifying the main theme of a text, or making a simple connection with everyday knowledge.

Below Level 1 (below 335 points): students are not able to show routinely the most basic type of knowledge and skills that PISA seeks to measure. These students may have serious difficulties in using reading literacy as an effective tool to advance and extend their knowledge and skills in other areas.

Figure 2.1 Percentage of students performing at each proficiency level on the PISA reading literacy scale, and the relative standing of countries, PISA 2000



* Because data are based on samples, it is not possible to report exact rank order positions for countries. However, it is possible to report the range of rank order positions within which the country mean lies with 95% likelihood. Data for the Netherlands were not included because the response rate was too low to ensure comparability.

Source: OECD PISA database at www.pisa.oecd.org

Data for Figure 2.1, p. 58.

Twelve countries recorded at least 20% of students at Level 1 literacy or below. The existence of a significant minority of students who, at age 15, lack the foundation of literacy skills needed for further learning, is of concern to those seeking to make lifelong learning a reality for all.

It is possible to summarise the performance of students in each country by computing a mean score across all student groups,² and then to

1. For most countries, performance in PISA is similar across the areas of reading, mathematical and scientific literacy. This chapter mainly focuses on student performance in reading literacy. It also concentrates on the 28 OECD countries that took part in PISA 2000. Further details on performance in all three areas, and in the four non-OECD countries in PISA 2000, are provided in OECD (2001a).

2. The scale that is used for this purpose was established such that the average score across OECD countries is 500, with about two-thirds of students across OECD countries scoring between 400 and 600 points.

assess the relative standing of countries in the international comparison on this measure. The rank order position of each country for student performance in reading literacy is also shown in Figure 2.1.

For some countries, the results displayed in Figure 2.1 were deeply disappointing, showing that their students' average performance lags considerably behind that of other countries, and sometimes despite high investments in schooling. Overall, however, the PISA 2000 results are encouraging. The performance of countries such as Finland and Korea reveals that excellence in schooling is attainable, and at reasonable cost.

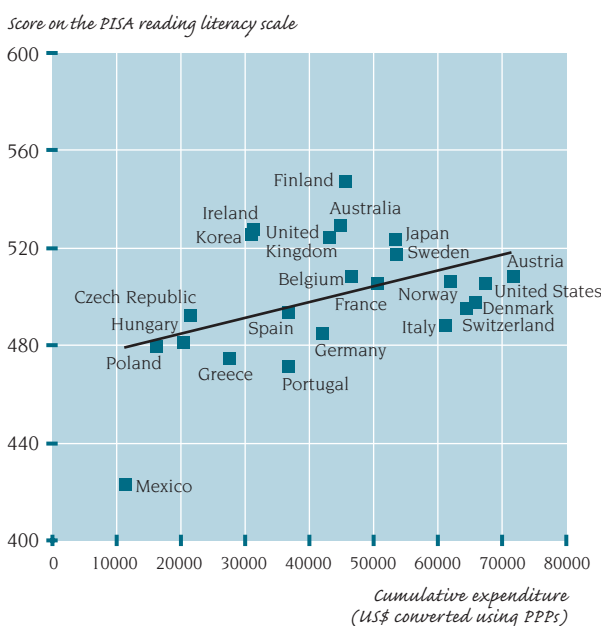
Figure 2.2 compares the money that countries spend per student, on average, from the beginning of primary education up to the age of 15, with average student performance.³ As expenditure per student on schools increases, so also, on average, does a country's mean performance.⁴ However, deviations from the trend line suggest that moderate spending per student is not necessarily associated with poor student performance. For example, Ireland and Korea are among the best performing countries, but spend less than US\$35 000 per student up to the age of 15 years, well below the OECD average of US\$45 000. Conversely, Italy spends almost US\$60 000 per student but performs significantly below the OECD average. Figure 2.2 therefore suggests that, as much as spending on schools is necessary for the provision of high-quality schooling, spending alone does not guarantee better outcomes. This chapter explores some of the other factors that seem to be important.

2.2 Social distribution of learning outcomes

Students come from a variety of social and cultural backgrounds. As a result, schools need to provide appropriate and equitable opportunities for a diverse student body. The relative success with which they do so is another important criterion for judging performance. Identifying the characteristics of the students who perform poorly can also help educators and policy makers determine priorities for policy intervention. Similarly, identifying the characteristics of students who perform well can assist policy makers to promote high levels of performance across-the-board.

Figure 2.2 Student performance on the PISA reading literacy scale and expenditure per student, OECD countries

Relationship between the average performance on the PISA reading literacy scale and cumulative expenditure on educational institutions from age 6 up to age 15 in US\$, converted using purchasing power parities (PPP)



Source: OECD PISA database at www.pisa.oecd.org; OECD (2001b).
Data for Figure 2.2, p. 59.

The report *Knowledge and Skills for Life – First Results from PISA 2000* (OECD, 2001a) shows that poor performance in school does not automatically follow from a disadvantaged home background. However, home background remains one of the most powerful factors influencing performance. The report shows, in particular, that:

3. Spending per student is approximated by multiplying public and private expenditure on educational institutions per student in 1998 at each level of education by the theoretical duration of education at the respective level, up to the age of 15. Expenditure on schooling is expressed in US\$ using purchasing power parities (PPP). The PPP exchange rates equalise the purchasing power of different currencies. This means that comparisons between countries reflect only differences in the volume of goods and services purchased.

4. Expenditure per student explains 19% of the variation between countries in mean performance on the reading literacy scale. The correlation for the overall relationship is 0.44.

- Parental occupational status, which is often closely interrelated with other attributes of socio-economic status, has a strong association with student performance. The average performance gap between students in the top quarter of PISA's index of occupational status (whose parents have occupations like medicine, university teaching and law) and those in the bottom quarter (occupations such as small-scale farming, truck-driving, and serving in restaurants), amounts to more than an entire proficiency level in reading literacy. In Germany, the difference is particularly striking. Students whose parents have the highest-status jobs score on average about as well as the average student in Finland, the best-performing country in PISA 2000; German students whose parents have the lowest-status jobs score about the same, on average, as students in Mexico, the OECD country with the lowest average performance in PISA.
- Possessions and activities related to “classical” culture also tend to be closely related to performance.⁵ The possession of the kind of cultural capital on which school curricula often tend to build, and which examinations and tests assess, appears closely related to student reading scores. The results of PISA 2000 also suggest that educational success may be related to patterns of communication between parents and children.
- Family wealth is also associated with higher levels of performance, although the relationship appears to be weaker than that of the other home background factors examined here.⁶
- Students who were born outside the country, as well as those who were born inside the country but have foreign-born parents tend, in most countries, to score much lower than other students, even after accounting for their other characteristics. The same is true for students whose language is different from the language of instruction. In both cases, however, the performance gap varies widely across countries.

Nevertheless, the PISA 2000 results show that while social background is a powerful influence

on learning outcomes, it plays a lesser role in some countries than in others. The policy goal must be to provide opportunities for all students to achieve their full potential. PISA 2000 suggests that this goal can be achieved.

3. IS THERE A TRADE-OFF BETWEEN QUALITY AND EQUITY?

Achieving an equitable distribution of learning outcomes without losing high performance standards represents a significant challenge. Analyses at the national level have often been discouraging: schools have appeared to make little difference in overcoming the effects of disadvantaged home backgrounds. As well, it has sometimes been argued that if school systems become more inclusive – for example, by increasing the proportion of young people who complete secondary school – then quality is bound to suffer. The international evidence from PISA 2000 is more encouraging. First of all, it is evident that wide disparities in student performance are not a necessary condition for a country to attain a high level of overall performance. Furthermore, while all countries show that students with more advantaged home backgrounds tend to have higher PISA scores, some countries demonstrate that high average quality and equality of outcomes among students from different backgrounds can go together. Figure 2.3 contrasts average performance in PISA 2000 in reading literacy – as shown

5. “Classical” cultural activities were measured through self-reports on how often students had participated in the following activities during the preceding year: visited a museum or art gallery; attended an opera, ballet or classical symphony concert; and watched live theatre. “Classical” cultural possessions in the family home were measured through students’ reports on the availability of the following items in their home: classical literature (examples were given); books of poetry; and works of art (examples were given).

6. Family wealth was derived from students’ reports on: a) the availability, in their home, of a dishwasher, a room of their own, educational software, and a link to the Internet; and b) the number of cellular phones, television sets, computers, motor cars and bathrooms at home. Home educational resources were derived from students’ reports on the availability and number of the following items in their home: a dictionary; a quiet place to study; a desk for study; textbooks; and calculators.

on the vertical axis – with the impact of family background on student performance – as shown on the horizontal axis.⁷

Canada, Finland, Iceland, Japan, Korea and Sweden all display above-average levels of student performance in reading literacy and, at the same time, a below-average impact of economic, social and cultural status on student performance. Conversely, average performance in reading literacy in the Czech Republic, Germany, Hungary, Luxembourg and Switzerland is below the OECD average while, at the same time, these countries display above-average disparities between

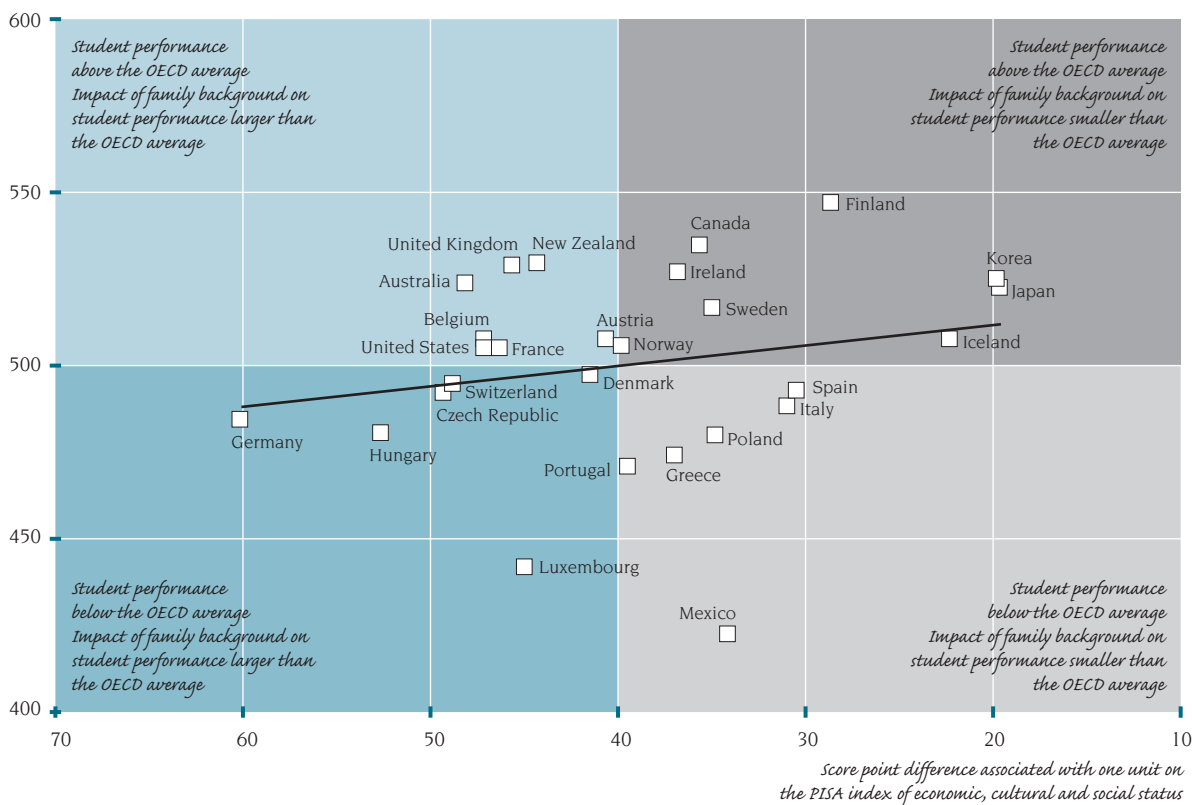
students from advantaged and disadvantaged family backgrounds.⁸

An important finding of PISA 2000 is thus that countries differ not just in their overall performance, but also in the extent to which they are able to close the performance gap between students from different social backgrounds. PISA 2000 suggests that maximising overall performance and securing similar levels of performance among students from different social backgrounds can be achieved simultaneously. The results suggest that quality and equity need not be considered as competing policy objectives.

Figure 2.3 Performance in reading and the impact of family background, OECD countries, PISA 2000

Relationship between the average performance of OECD countries on the PISA reading literacy scale and the socio-economic distribution of student performance

Score on the PISA reading literacy scale



Note: The mean reading performance in five countries is not statistically different from the OECD average: Denmark, France, Norway, Switzerland and the United States. The socio-economic distribution of student performance in eight countries is not statistically different from the OECD average: Austria, Denmark, Greece, Ireland, New Zealand, Norway, Poland and Portugal.

For the definition of the PISA index of economic, social and cultural status, see OECD (2001a).

Source: OECD PISA database at www.pisa.oecd.org

Data for Figure 2.3, p. 59.

4. POINTERS FOR POLICY

The high and equitable performance standards achieved by some countries set ambitious goals for others. The question is what they can learn from the results to help students to achieve more, teachers to teach better, and schools to be more effective. PISA 2000 does not show which policies or practices *cause* success, but it does allow us to observe some common characteristics of high-performing students, schools and systems. PISA cannot, on its own, provide clear-cut answers as to why the countries performed so differently, or definitive guidance to the policy directions that countries should take. However, analyses of the wide range of student and school background data collected by PISA 2000 can provide pointers to stimulate and inform national debate, as well as guide future work.

4.1 Strengthening student engagement

Developing the predisposition of students to engage with learning and the capacity to do so effectively are important objectives, especially with an eye to fostering lifelong learning. Students who leave school with the capacity to set their own learning goals, and with a sense that they can reach those goals, are potential learners for life.

In PISA 2000, students' engagement with learning was measured by their engagement in reading, as well as by their broader engagement with school. Reading engagement was measured through a combination of the student's reading habits and attitudes.⁹ A comparison of countries on this index shows that students' engagement in reading is clearly linked with reading proficiency, although the data do not allow one to discern in which direction this relationship operates and to what extent other, non-measured factors are at play. In all countries, students who are more engaged in reading score, on average, better.¹⁰

Table 2.1 shows, not surprisingly, that the country with the highest level of engagement in reading is the one with the highest average reading scores, Finland, in which students' average score on the index of engagement is 0.46. Other countries where the level of engagement in reading is high

are Denmark (0.26), Iceland (0.27), Japan (0.20) and Korea (0.21). By comparison, countries where the level of engagement is relatively low are Belgium (-0.28), Germany (-0.26), Ireland (-0.20), Luxembourg (-0.19) and Spain (-0.23). To some extent the differences among country means on the index may represent cultural differences in student responses to the questions through which engagement was captured. Ireland is an example of a high-performing country in which there is a strong within-country relationship between student engagement and reading performance, but where there is a relatively low country average on the engagement index.

In addition to the strong association between student performance in reading literacy and engagement in reading within countries, the analysis also

7. To capture a student's family and home background, an index of economic, social and cultural status was created on the basis of students' reports on the following background characteristics: the occupation of the parents; the highest level of education of the student's parents; an index of family wealth; an index of home educational resources; and an index of cultural possessions in the family home. Details of these measures are provided in OECD (2002a).

8. In such a comparison, the spread of social background characteristics in the population needs to be taken into consideration, as social equity in student learning outcomes may be more difficult to obtain in countries with large social disparities in the population. To shed light on this, the last column in the data table for Figure 2.3 (see p. 59) shows the difference between the 95th and 5th percentiles of the student distribution on the PISA index of economic, cultural and social status, which illustrates the extent of socio-economic differences in the families of 15-year-olds in each country. It is noteworthy that the cross-country correlation between this measure and the socio-economic differences in PISA scores is small and not statistically significant, suggesting that the results cannot be explained with the spread of social background characteristics as measured by PISA.

9. Specifically, students were asked to rate how frequently they read different kinds of material and how much time they invest in reading for enjoyment. Both aspects were combined into an index, in which the engagement level for the average OECD student is set at zero, and two-thirds of students score between +1 and -1. Thus a positive or negative score does not indicate positive or negative engagement in reading, but shows whether students are more or less engaged than the average for other students in OECD countries.

10. The within-country correlation between reading performance and engagement averages 0.38 in OECD countries, and the cross-country correlation between mean reading performance and mean engagement is 0.27.

Table 2.1 Reading performance and engagement in reading, OECD countries

	Performance on the PISA reading literacy scale		PISA index of engagement in reading ¹		Correlation between the PISA index of engagement in reading and proficiency on the PISA reading literacy scale	
	Mean score	S.E.	Mean index	S.E.		
Australia	528	(3.5)	-0.04	(0.03)	0.42	-(0.02)
Austria	507	(2.4)	-0.08	(0.03)	0.41	-(0.02)
Belgium	507	(3.6)	-0.28	(0.02)	0.36	-(0.02)
Canada	534	(1.6)	0.01	(0.01)	0.40	-(0.01)
Czech Republic	492	(2.4)	0.02	(0.02)	0.42	-(0.01)
Denmark	497	(2.4)	0.26	(0.02)	0.43	-(0.02)
Finland	546	(2.6)	0.46	(0.02)	0.48	-(0.01)
France	505	(2.7)	-0.18	(0.02)	0.35	-(0.01)
Germany	484	(2.5)	-0.26	(0.02)	0.41	-(0.02)
Greece	474	(5.0)	-0.09	(0.02)	0.25	-(0.02)
Hungary	480	(4.0)	0.03	(0.02)	0.41	-(0.02)
Iceland	507	(1.5)	0.27	(0.01)	0.45	-(0.02)
Ireland	527	(3.2)	-0.20	(0.02)	0.39	-(0.02)
Italy	487	(2.9)	-0.08	(0.02)	0.30	-(0.02)
Japan	522	(5.2)	0.20	(0.03)	0.32	-(0.01)
Korea	525	(2.4)	0.21	(0.02)	0.35	-(0.01)
Luxembourg	441	(1.6)	-0.19	(0.02)	0.25	-(0.02)
Mexico	422	(3.3)	0.07	(0.01)	0.24	-(0.02)
New Zealand	529	(2.8)	0.05	(0.02)	0.35	-(0.02)
Norway	505	(2.8)	0.09	(0.02)	0.45	-(0.02)
Poland	479	(4.5)	-0.10	(0.02)	0.28	-(0.02)
Portugal	470	(4.5)	0.13	(0.02)	0.32	-(0.02)
Spain	493	(2.7)	-0.23	(0.02)	0.38	-(0.01)
Sweden	516	(2.2)	0.14	(0.02)	0.45	-(0.02)
Switzerland	494	(4.3)	0.00	(0.01)	0.46	-(0.02)
United Kingdom	523	(2.6)	-0.10	(0.02)	0.37	-(0.02)
United States	504	(7.1)	-0.14	(0.03)	0.31	-(0.02)
OECD average	500		0.00		0.38	
Netherlands ²			-0.2	(0.04)	0.38	-(0.02)

1. For a definition of this index, see footnote 9. Note that the definition of this index differs slightly from the index used in OECD (2001a).

2. Response rate is too low to ensure comparability.

Source: OECD PISA database at www.pisa.oecd.org; OECD (2001a).

suggests that student engagement in reading may be an important factor that can offset social disadvantage. In order to examine this issue, students were classified in terms of whether they reported low, medium or high engagement in reading, and whether their parents had low, medium or high occupational status. For this purpose, “medium” refers in each case to the middle half of students, and “low” and “high” refer to the top and bottom quarters respectively.

Students who are less engaged readers tend to be more numerous among the group of students whose

parents have the lowest occupational status. Highly engaged students are more numerous among the group of students whose parents have the highest occupational status. However, PISA also shows that there are students from disadvantaged family backgrounds who are highly engaged in reading, as well as students from more privileged backgrounds who are among the least engaged readers (Table 2.2).

Table 2.3 records how these groups of students are distributed in terms of their reading literacy performance. Not surprisingly, students who have parents with the highest occupational status and

who are highly engaged in reading obtain the best average scores on the reading literacy scale (583). Students who have parents with the lowest occupational status and who are the least engaged in reading achieved the lowest average score (423). However, perhaps most importantly, students who are highly engaged readers and whose parents have the lowest occupational status achieved significantly higher average reading scores (540) than students whose parents have the highest occupational status but who are poorly engaged in reading (491). Furthermore, these highly engaged students whose parents have low occupational status performed as well on average as those students who are in the middle engagement group but whose parents have high-status occupations. That is to say, coming from a higher-status home background is less of an advantage, on its own, than being more highly engaged in reading.

Students who are highly engaged in reading achieve reading literacy scores which, on average, are significantly above the international mean (500), whatever their family background. Conversely, students who are poorly engaged in reading

obtained scores below the international mean, regardless of their parents' occupational status. Within each grouping of occupational status, students who are in the group of least engaged readers attain average reading literacy scores which are from 85 to 117 points lower than those who are in the highly engaged reading group (see Table 2.3). The largest such difference is seen among students whose parents have the lowest-status occupations.

These findings are of paramount importance from an educational perspective. Although the data do not show in which direction the relationship operates, one interpretation is that building student engagement with reading can play an important role in reducing the gap between the reading performance of students coming from different family backgrounds. Achieving this objective will also serve other important educational goals since reading is a fundamental skill required across the curriculum.

The patterns shown for engagement in reading are largely mirrored in students' broader engagement with school, although the relationship differs

Table 2.2 Expected and observed percentages of students classified by the PISA index of engagement in reading and the PISA index of occupational status, 2000

PISA index of occupational status	Low engagement		Medium engagement		High engagement	
	"Expected"	Observed	"Expected"	Observed	"Expected"	Observed
Low	6.3	7.6	12.3	12.6	6.3	4.9
Medium	12.3	12.9	25.0	25.1	12.3	12.0
High	6.3	4.5	12.3	12.3	6.3	8.2
Total	25.0	25.0	50.0	50.0	25.0	25.0

Note: The "expected" percentage of students in a given category is simply the nominal percentage obtained from allocating one-quarter of the "low" and "high" students on each variable, and one-half of the "medium" students, respectively, to the category concerned. The "observed" percentage is the actual percentage of students in each category as revealed by the PISA results.

Source: OECD PISA database at www.pisa.oecd.org

Table 2.3 Reading performance of students classified by the PISA index of engagement in reading and the PISA index of occupational status, 2000

PISA index of occupational status	Low engagement	Medium engagement	High engagement
Low	423	467	540
Medium	463	506	548
High	491	540	583

Source: OECD PISA database at www.pisa.oecd.org

across countries. The evidence from PISA 2000 suggests that those students who are engaged in school perform better than those who are not. In almost all countries, students who report that school is a place where they want to go perform better than those who do not. Across the OECD, an average of 87% of students report that school is a place where they make friends easily, and three-quarters say that school is a place where they feel they belong, the proportion ranging from around 50% or less in France and Spain to 88% in Hungary and Mexico. By contrast, there is a small but significant group of students for whom school is a difficult social environment. On average, across the OECD, 13% of students report that school is a place where they feel awkward and out of place (for country data see OECD, 2001a).

The data on engagement in school do not establish a causal relationship with student performance. There are other factors that influence both performance and attitudes towards school. In addition, doing well at school might cause students to like it more, rather than vice versa. However, it is unsatisfactory that a significant minority of students – and in some cases even a majority – display a lack of engagement, and negative attitudes towards school. It is hard to imagine that schools can achieve good results unless students are positively engaged. Furthermore, students who are disaffected with school may also be less likely to engage in learning activities in later life.

Schools and education systems need to aim at lifting *both* performance and engagement, in order to increase average performance and to ensure an equitable distribution of learning outcomes. For example, teachers need to provide each student with the skills to be a good reader, as well as interesting the student in being a good reader. If these mutually reinforcing goals can be achieved, a more secure foundation for lifelong learning will have been established for students from all backgrounds.

4.2 Shifting the focus to learning outcomes

The PISA 2000 results confirm a range of other research which suggests that students perform best in a positive learning environment that is oriented towards results. PISA 2000 indicates that students and schools perform better in a climate character-

ised by high expectations and the readiness to invest effort, the enjoyment of learning, a strong disciplinary climate, and good teacher-student relations. Among these aspects, students' perception of teacher-student relations and classroom disciplinary climate have the strongest relationships with student performance, across countries.¹¹ Performance orientation, which was measured by students' perceptions of the extent to which teachers emphasise academic performance and place high demands on students, is also positively related to performance, but less strongly so. Students also perform better where principals report a more positive school climate, higher teacher morale, and a greater degree of school autonomy.¹²

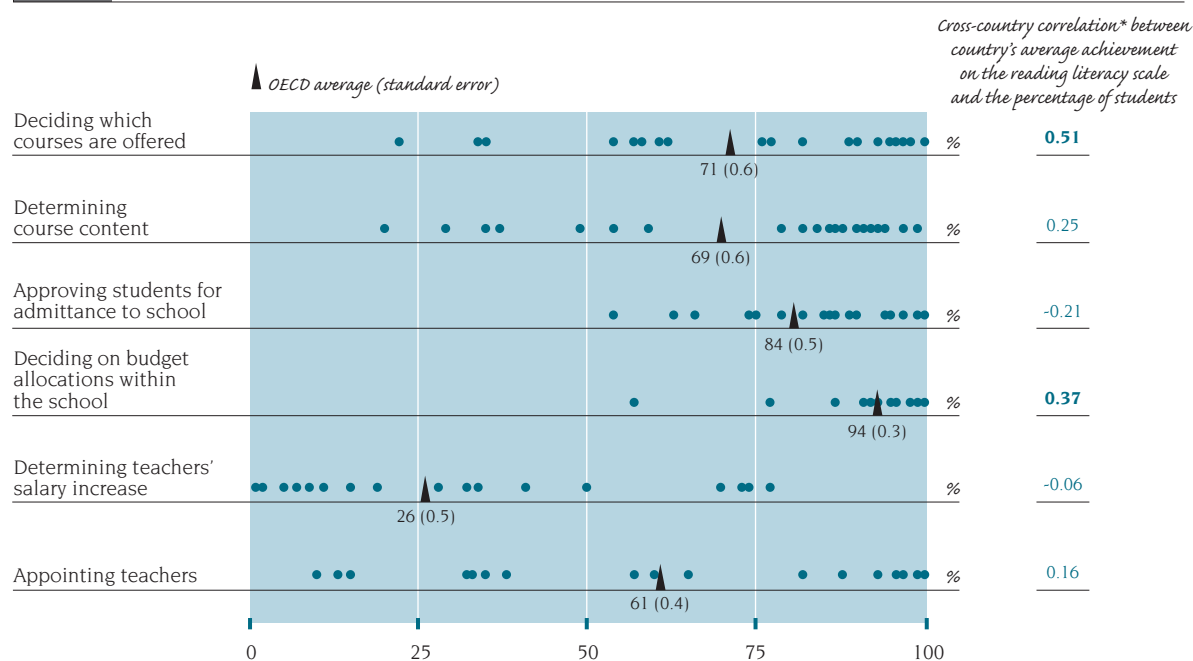
Many of the countries that performed well in PISA 2000 have been progressively shifting education policy and practice away from a focus on inputs – the resources, structures and content of schooling – and towards a focus on learning outcomes. Perhaps not surprisingly therefore, PISA 2000 shows that schools in such countries often have greater freedom to organise their learning environment and the range of subjects that they offer, and to administer the resources allocated to them.

Devolving more decision-making authority to schools has been a key strategy in many countries since the early 1980s. School-based management is intended to increase creativity and responsiveness to local needs. This involves enhancing the decision-making responsibility and accountability of principals and, in some cases, the management responsibilities of teachers or department heads.

In order to gauge the extent to which school staff have a say in decisions relating to school policy and management, principals in PISA 2000 were asked to report whether teachers, department heads, the principal, an appointed or elected board, or education authorities, had the main responsibility for a wide range of aspects of schooling. The results are summarised in Figure 2.4 (see also data table for Figure 2.4 at end of the chapter).

According to school principals, schools in most countries appear to have little say in the establishment of teachers' starting salaries and in determining teachers' salary increases. In all countries other than

Figure 2.4 Percentage of students enrolled in schools which have at least some responsibility for the following aspects of school policy and management, OECD countries, PISA 2000 (each country represented by a dot)



* Statistically significant correlations are shown in bold.

Source: OECD PISA database at www.pisa.oecd.org

Data for Figure 2.4, pp. 60-61.

the Czech Republic, Greece, the Netherlands, the United Kingdom and the United States, two-thirds or more of 15-year-olds are enrolled in schools whose principals report that schools have no responsibility for the establishment of teachers' starting salaries. The scope to reward teachers financially, once they have been hired, is also limited. Only in the Czech Republic, Greece, Sweden, the United Kingdom and the United States are more than two-thirds of the students enrolled in schools which have some responsibility for determining teachers' salary increases.

There appears to be greater flexibility for schools with regard to the appointment and dismissal of teachers. Germany and Italy are the only countries in which about 90% or more of 15-year-olds are enrolled in schools whose principals report that the school has no responsibility in these matters. Conversely, in Belgium, the Czech Republic, Denmark, Iceland, Sweden, Switzerland, the United Kingdom and the United States, at least 93% of students attend schools that have some responsibility for the appointment of teachers (the

OECD average is 61%). In the majority of countries, principals tend to report a more prominent role for the school in appointing teachers than in dismissing them, the largest differences being found in Canada and Denmark (21 and 40 percentage points, respectively). In Belgium, the Czech Republic, Hungary, Iceland, the Netherlands, New Zealand, and the United States, more than 95%

11. The average difference between the reading literacy scores of students who report these characteristics as more favourable or less favourable (separated by one standard deviation in the international distribution of students ranked according to each characteristic), is 18 points in the case of student-teacher relations and 10 in the case of disciplinary climate (see OECD, 2001a).

12. An increase of one unit on the respective PISA indices (corresponding to one international standard deviation) is associated with gains on the reading literacy scale of about 6, 2 and 5 points, respectively (see OECD, 2001a). When interpreting such results, it should be noted that many factors influencing student performance, in particular those related to teachers and teaching, were not directly measured in PISA 2000. The results reported here are therefore likely to understate the impact of such factors.

of the students are enrolled in schools whose principals report having some say in the dismissal of teachers (the OECD average is 54%).

There is variation also with regard to the roles that schools play in the formulation of budgets, Austria and Germany reporting the least involvement of schools with this task. Schools in Australia, Belgium, Italy, Luxembourg, the Netherlands, New Zealand, the United Kingdom and the United States have a comparatively high degree of school autonomy with regard to budget formulation. In most countries, principals generally report a high degree of school involvement in decisions on how money is spent within schools (the OECD average is 94%).

In all OECD countries, the majority of 15-year-olds are enrolled in schools which have some responsibility for student admissions (the OECD average is 84%). With the exception of Germany, Italy and Switzerland, the majority of 15-year-olds are also enrolled in schools that play a role in deciding on the courses offered (the OECD average is 71%). Finally, most principals (the OECD average is around 90%) report that disciplinary policies, assessment policies and choice of textbooks are school responsibilities.

Does the distribution of decision-making responsibilities affect student performance? In some countries, most notably Australia, Austria, Canada, Ireland, Spain and Switzerland the relationship between school autonomy and student performance is strong and significant, even when other school characteristics are held constant.¹³ In other countries, the association between the different aspects of school autonomy and student performance *within* the country tends to be weaker, often because legislation specifies the distribution of decision-making responsibilities so that there is little variation among schools. When looking *across* countries, however, PISA 2000 suggests that in those countries in which principals report, on average, a higher degree of school autonomy with regard to choice of courses, the average performance in reading literacy tends to be higher than in other countries. The cross-country relationship is summarised by the country-level correlations shown in Figure 2.4.¹⁴ The picture is similar, though less pronounced, for other aspects of school

autonomy, including the relationship between mean performance and the degree of school autonomy in budget allocation. This finding cannot, of course, be interpreted in a causal sense as, for example, school autonomy and performance could well be mutually reinforcing or influenced by other factors.

While countries with greater levels of school autonomy in particular areas tend to perform better, a concern is that greater independence of schools might lead to greater inequalities in the performance of schools. One way to examine this is by relating the PISA measures of school autonomy to the proportion of student performance differences that lies between schools.¹⁵ This comparison does not reveal a consistent relationship, and therefore suggests that greater school autonomy is not necessarily associated with greater disparities in school performance. For example, Finland and Sweden, among the countries with the highest degree of school autonomy on many of the measures used in PISA 2000 display, together with Iceland, the smallest performance differences among schools.

As a counterpart to more autonomy, schools in the better performing countries also tend to be responsible for addressing the needs of a diverse student population. They rarely have the option to transfer students to educational streams or school types with lower performance requirements, options that often exist in lower performing countries. These aspects are examined more closely in the next section.

13. For these countries, the effect size of the relationship between the PISA index of school autonomy and student performance on the reading literacy scale is between 8 and 38 score points on the PISA reading literacy scale (see OECD, 2001a).

14. It should be noted that the analysis is subject to the limitation that there were 32 countries from which PISA students were sampled in 2000. While this number of countries is an advance over most previous comparative analyses, it remains small. Consequently, effects need to be fairly strong to be detectable by conventional statistical standards. Expressed as a bivariate correlation, only coefficients of 0.30 or higher will be statistically significant.

15. The performance differences between schools are indicated in Figure 2.5 and its supporting data table.

4.3 Securing consistent standards for schools

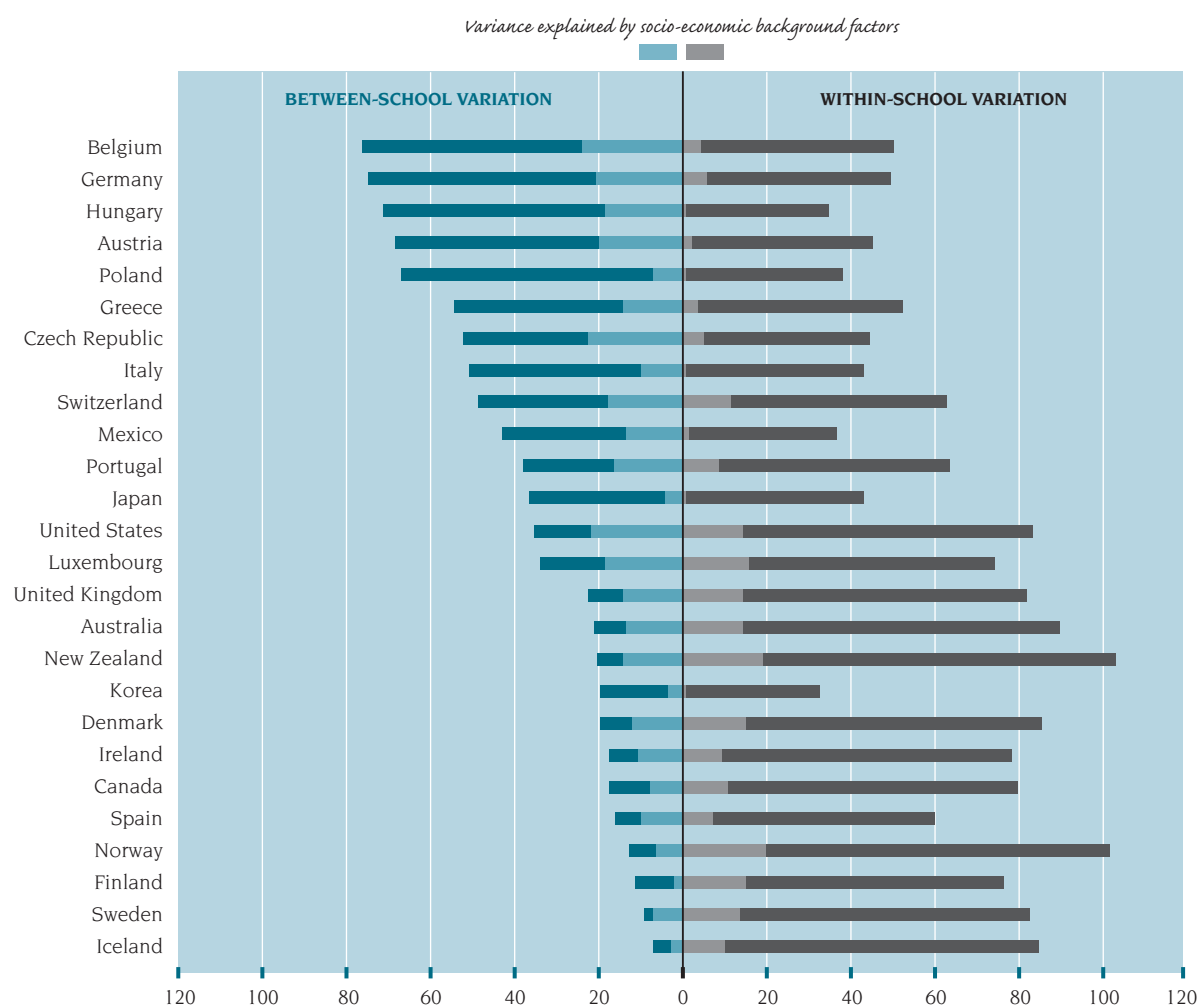
Some countries have non-selective school systems in which all schools provide similar opportunities for learning and need to cater for the full range of student performance. Other countries respond to diversity by forming groups of students of similar levels of performance through selection either within or between schools, with the aim of serving

students according to their respective ability levels and needs. How do such policies and practices affect actual student performance and the ways in which family background influences student success?

Figure 2.5 shows considerable differences in the extent to which the reading literacy skills of 15-year-olds vary within each country. The length of the bars

Figure 2.5 Variations in reading literacy performance between and within schools, OECD countries, PISA 2000

Expressed as a percentage of the average variation in student performance in OECD countries



Note: The values are expressed as percentages of the average variation between OECD countries in student performance. For each country, a distinction is made between how much of this variation can be accounted for by the different results of each school (to the left of the central line) and how much is to do with a range of student results within each school (to the right of the central line). The length of each segment is relative to the total variation in all OECD countries, which is set at 100. A bar longer than 100 in a segment on the horizontal axis indicates that variation in student performance is greater in that country than in a typical OECD country. A value smaller than 100 indicates below-average variation in student performance. The shading on the bars in each segment at the middle part of the chart indicates the proportion of variation explained by socio-economic background factors. Owing to the sampling methods used in Japan, the between-school variation in Japan includes variation between classes within schools.

Source: OECD PISA database at www.pisa.oecd.org

Data for Figure 2.5, p. 62.

indicates the total observed variation in student performance in reading literacy. For each country, a distinction is made between how much of this variation can be accounted for by the different results of each school and how much is to do with a range of student results within each school. The length of bars to the left of the central line shows between-school differences; to the right are within-school differences. Note that the numbers on each segment are relative to the *total* variation in all OECD countries, which is set at 100.

Substantial variation between schools and less variation among students within schools (*e.g.* in Hungary and Poland) indicates that students are generally in schools where other students perform at levels similar to their own. This selectivity may reflect family choice of school or residential location, policies on school enrolment, or allocation of students. On average across OECD countries, 36% of the total variation in student performance in reading literacy is attributable to variation between schools.

In Austria, Belgium, the Czech Republic, Germany, Greece, Hungary, Italy, Mexico and Poland, there is more variation between, than within, schools. In Korea, most of the variation is within schools but, more importantly, both within- and between-school variation are only around half of the OECD average. Korea thus not only achieves high average performance in reading and low overall disparity between students, but does so with relatively little variation in performance between schools. Spain also shows low overall variation (around three-quarters of the OECD average) and low between-school variation (16% of the OECD average for all variation) but, unlike Korea, has a mean score well below the OECD average. The smallest variation in reading performance between schools occurs in Finland, Iceland and Sweden, where it accounts for only between 7 and 11% of the average total student variation in OECD countries.

Overall, it is striking to see that in each of the seven countries with the highest mean scores in reading literacy (Australia, Canada, Finland, Ireland, Korea, New Zealand and the United Kingdom), differences between schools account for variations in performance that are less than a quarter of overall student variation in the average OECD country. These countries therefore succeed in securing high

average performance levels relatively consistently across schools. Conversely, there is a clear tendency for larger disparities among schools to be associated with lower overall performance.¹⁶ This suggests that securing similar performance standards among schools, perhaps most importantly through identifying and reforming poorly performing schools, is not just an important policy goal in itself, but that it may also contribute to high overall performance.

4.4 Mitigating the impact of family background

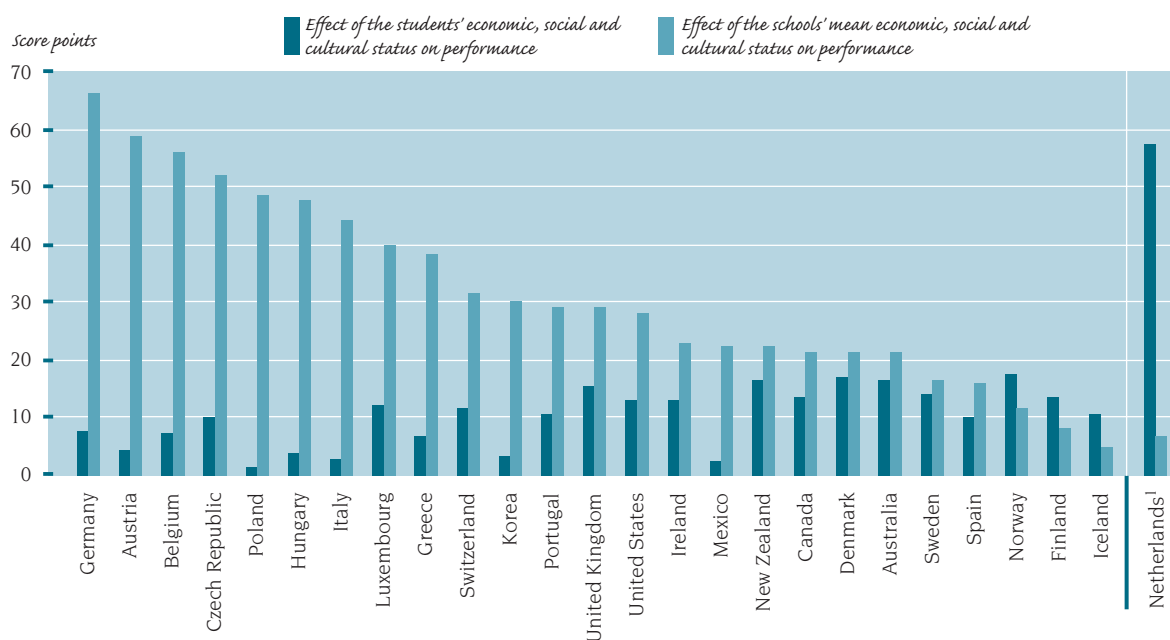
The proportion of the variation in student performance within and between schools that is attributable to students' family background is also indicated in Figure 2.5. For example, in Sweden 17% of the within-school variation, and 73% of the between-school variation, is attributable to the family background factors measured by PISA. These percentages differ markedly from, say, those of Poland, where students' family background accounts for 2% of the within-school variation, and 10% of the between-school variation.

In comparing the extent to which the between-school differences are attributable to students' family backgrounds, it is important to take account of the size of the differences between schools. For example, family background factors account for more of the between-school differences in Sweden than in any other country, but Sweden (9%) has less variation in performance between schools than all other countries except Iceland (7%). Family background factors account for less of the between-school variation in Poland (10%) than in any other country, but Poland has more variation in performance between schools than in all but four other countries (Austria, Belgium, Germany and Hungary). In general, the greater the differences between schools, the smaller the proportion that can be attributed to students' family backgrounds.

Individual and school-level effects of family background

The analysis shows that, in many countries, a substantial portion of the between-school variation in performance in reading literacy is

16. The cross-country correlation between average performance and the proportion of the OECD average variation in student performance that is accounted for by schools is -.46.

Figure 2.6 Effects of student socio-economic background and school socio-economic composition on performance on the reading literacy scale, OECD countries, PISA 2000

Note: The two columns for each country show the number of reading score points associated with an increase of half a standard deviation in (a) the measure of individual student economic, social and cultural status, and (b) the schools' mean economic, social and cultural status. These were estimated using a multi-level model that included gender, ethnicity, and student and school-level measures of family background ("economic, social and cultural status").

1. Response rate is too low to ensure comparability.

Source: OECD PISA database at www.pisa.oecd.org

Data for Figure 2.6, p. 63.

associated with differences in students' socio-economic backgrounds. This effect can operate in two ways. First, students' individual backgrounds may influence their performance. But in addition, the aggregate impact of the backgrounds of all the students enrolled in a school can also influence individual students. Understanding this collective impact is of key importance for policy-makers wishing to provide all students with equal opportunities.

Schools whose intakes have a higher average level of socio-economic status tend to have several advantages. They are likely to have greater support from parents, fewer disciplinary problems, better qualified teachers and higher teacher morale, better teacher-student relations, and generally a school climate that is oriented towards higher performance. There is often also a faster-paced curriculum in such schools. Some of the "contextual effect" associated with high socio-

economic status may also stem from peer interactions as talented students work with each other. Peer pressure, peer competition and the focus in some schools on entry into tertiary education may also play a role.

Figure 2.6 estimates the strength of the relationship between reading literacy performance and socio-economic status, on the one hand of the individual student and on the other of all the students at a given school.¹⁷ The lengths of the bars indicate the differences in scores in reading literacy associated with a given difference in the socio-economic status of different students,

17. These were estimated with a multilevel model (*i.e.* one that looks successively at the additional effect of a range of factors), taking account of economic, social and cultural status, gender, ethnicity, and family structure at the student level, and mean economic, social and cultural status at the school level.

and the average socio-economic status of those enrolled in schools.¹⁸

In almost all countries there appears to be a clear advantage in attending a school whose students are, on average, from more advantaged family backgrounds. On average across OECD countries, this contextual effect is over three times as large as the direct effect associated with individual student background.¹⁹ The socio-economic intake of the school thus has a strong association with student reading performance.²⁰

Some of the observed contextual effect might be due to aspects of school quality. For example, to the extent that schools differentiated by academic tracking are also differentiated by socio-economic status, the school-level effect of socio-economic status would be reinforced by systematic curriculum differences. Some of the contextual effect might also be due to peer effects. But some of it might be due to other factors which are not accounted for in PISA, such as parental attitudes. Also, in many education systems students are allocated to different types of school or programme on the basis of factors which include their academic ability. Therefore, the findings should not lead to the conclusion that transferring a group of students from a school with a low socio-economic intake to a school with a high socio-economic intake would result automatically in the gains suggested by Figure 2.6.

Analysing the processes at work

In order to develop education policy in the light of these findings, there needs to be an understanding of the nature of the formal and informal mechanisms that contribute to between-school socio-economic differentiation, and its effect on students' performance. In some countries, students are highly differentiated along socio-economic lines, in part because of residential location and economic factors, but also because of features of the education system. Education policy in such countries might attempt to moderate the impact of socio-economic background on student performance by reducing the extent of differentiation along socio-economic lines, or by allocating resources to schools differentially. In these countries, it may be necessary to examine

how the allocation of school resources relates to the socio-economic intake of schools.

In other countries, structural features of the education system stream or track students into programmes with different curricula and teaching practices (this aspect is examined in more detail below). To the extent that the allocation of students to programmes in such systems is inter-linked with students' socio-economic background, those from disadvantaged backgrounds may not achieve their full potential. And in other countries, there is relatively little socio-economic differentiation, *i.e.*, schools tend to be similar in their socio-economic intake. Education policy in these countries might aim at moderating the impact of socio-economic background through measures aimed at improving school resources and reducing within-school differentiation according to students' economic, social and cultural status.

Table 2.4 shows that the combined influence of school-level factors, including those examined in the preceding section, explains about 31% of the variation between schools within countries, and 21% of the variation between countries. Students' individual family backgrounds, together with the mean socio-economic status of the school, explain

18. The score difference shown is for half a standard deviation of difference on the PISA index of economic, cultural and social status. What is important here is not the absolute value of these differences, but the comparison between individual student and whole-school effects across different countries.

19. A measure of 0.5 of a student-level standard deviation was chosen for the comparisons because this value describes realistic differences between schools in terms of their socio-economic composition. On average across OECD countries, the difference between the 75th and 25th quartiles of the school mean index of economic, social and cultural status is 0.72 of a student-level standard deviation and, in all but one OECD country, this difference is greater than, or equal to, half a student-level standard deviation on the socio-economic index.

20. Since no data on students' earlier achievement are available from PISA, it is not possible to determine to what extent the school background relates directly or indirectly to students' performance – by way of selection or self-selection, for example. In the interpretation of these findings, it also needs to be borne in mind that differences in the averages of schools' socio-economic backgrounds are naturally much smaller than comparable differences between individual students, given that every school's intake is mixed in terms of socio-economic variables.

about 12% of the differences between students within schools. On the other hand, they account for 66% of the differences in performance between schools and for 34% of the performance differences between countries. Together, family background and school factors explain most differences in performance between schools. On average, 72% of observed variation between schools within countries is accounted for by the combination of the school-level and student background factors identified through PISA.

The combined influence of school and background factors on differences in school performance is not simply the sum of the influence of school factors and that of background factors. This is because many characteristics of schools are closely associated with the characteristics of the families of their students. This means that some of the effect of family background on school results is *mediated* by the school characteristics.

Consider, for example, the predicted difference between PISA 2000 reading literacy scores in two schools whose students have different backgrounds – with a gap of one unit in their average scores on the index of economic, social and cultural status. In total, students at the school with students from higher-status backgrounds are expected to score 68 points more, on average, across OECD countries (see Table 2.4). Some of this difference arises because, on average, better-off students attend schools with features associated with better performance – this is the mediated portion. It accounts for about 11 of the 68 points in difference. The 11-point difference can be taken as an indicator of the extent to which school systems tend, on average, to reinforce the advantage of those students who already come from advantaged backgrounds. The remaining effect of student background – that which is not associated with school variables – accounts for 57 points.

Table 2.4 Effects of student-level and school-level factors on performance on the PISA reading literacy scale, for all OECD countries combined

		Reading literacy scale					
		Model 1: impact of school factors ¹		Model 2: impact of family background ¹		Model 3: joint impact of school factors and family background ¹	
	Increase	Effect	S.E.	Effect	S.E.	Effect	S.E.
Family background and student characteristics							
Student-level index of economic, social and cultural status	1 unit			20.1	(2.07)	20.1	(2.07)
Student-level index of economic, social and cultural status squared				-1.7	(0.34)	-1.7	(0.35)
Student is female	1 student-level unit			67.5	(6.48)	56.6	(5.41)
Student is foreign-born				25.5	(1.97)	25.0	(2.03)
				-23.2	(2.87)	-23.1	(2.88)
Percentage of variance explained							
Students within schools		0.0		12.4		12.4	
Schools within countries		31.0		66.1		71.9	
Between countries		20.8		34.3		43.4	

1. For an explanation of the models, see OECD (2001a).

* These indices were standardised to have a mean of 0 and a standard deviation of 1 for schools in OECD countries.

Effects marked in bold are statistically significant.

Source: OECD PISA database at www.pisa.oecd.org

It is possible to examine the extent to which the association between individual school factors (such as more resources) and higher performance can be accounted for by the more advantaged background of students who attend schools with better features. In most cases, the separate impact of the school factors becomes smaller once family background is taken into account, because many of the factors related to school quality are correlated with the school's economic, social and cultural status. For example, on average across OECD countries, PISA 2000 shows that half the reported effect of differences in school resources, and two-thirds of the effect of school size and student-teaching staff ratios, are associated with family background. In the case of variables describing school policy and practice, there is an even greater association. On the other hand, most of the impact of teacher-student relations and disciplinary climate is independent of family background.

Furthermore, beneficial school effects appear to be reinforced by socio-economic background. Schools with more resources and policies and practices associated with better student performance tend to have more advantaged students. For example, in Belgium, Germany and Luxembourg, larger numbers of specialist teachers²¹ tend to be employed in schools with a more advantaged socio-economic background. Student responses generally indicate that schools with a higher socio-economic intake also have a better disciplinary climate. And finally, students in schools with high socio-economic status tend to use school resources more regularly than students in other schools (OECD, 2001a).

The overall conclusion is that the student's own home background is only part of the story of socio-economic disparities in education – and in most countries the smaller part. The net result is that in countries where there is a high degree of differentiation between schools along socio-economic lines, students from disadvantaged socio-economic backgrounds do worse. This, in turn, means that some of the *inequality of outcomes* is associated with *inequality of opportunity*. In such circumstances, talent remains unused and human resources are wasted. To the extent that the allocation of students to programmes in such systems is inter-linked with students' socio-economic background, those from disadvantaged backgrounds may not achieve their full potential.

4.5 Containing the impact of institutional differentiation

A much debated policy question is to what extent structural characteristics of educational systems moderate, or perhaps reinforce, socio-economic disparities. Table 2.5 displays some features of school systems that are relevant in this context.

One device to differentiate among students is the use of different institutions or programmes that seek to group students by their level of performance. Students of similar performance levels are sorted into the same type of institution or programme on the assumption that their talents will develop best in a learning environment in which they can stimulate each other equally well, and that an intellectually homogeneous student body will be conducive to the efficiency of teaching. The measure shown in Table 2.5 range from essentially undivided secondary education until age 15 to systems with four school types or distinct educational programmes (Austria, Hungary, the Netherlands and Switzerland). A specific aspect of such differentiation is the separate provision of general academic and vocational programmes. Vocational programmes differ from academic ones not only with regard to their curriculum, but also in that they generally prepare students for specific types of occupations and, in some cases, for direct entry into the labour market.

Another important dimension is the age at which decisions between different school types are generally made, and therefore students and their parents are faced with choices. Such decisions occur very early in Austria and Germany, at around age 10. By contrast, in countries such as New Zealand, Spain and the United States no formal differentiation takes place until the completion of secondary education.²² Grade repetition can

21. For the purpose of this analysis, specialist teachers are defined as teachers with a university-level qualification with a major in the subject area assessed by PISA.

22. Since PISA assessed 15-year-olds, it only allows inferences concerning stratification introduced prior to that age. There is a clear tendency for overall variation in student performance and the impact of socio-economic background on performance to be greater the earlier institutional stratification starts. The association is strongest in countries that begin institutional stratification in the age range 10-12 years.

Table 2.5 Structural features of school systems

	First age of selection in the education system ¹	Variation in grade levels in which 15-year-olds are enrolled ²	Number of school types or distinct educational programmes available to 15-year-olds	Proportion of 15-year-olds enrolled in pre-vocational educational programmes ¹	Total variation in student performance between schools
Australia	a	0.47	a	23	21
Austria	10	0.61	4	44	69
Belgium (Fl.)	12	0.59	3	18	76
Belgium (Fr.)	12	0.59	4	18	76
Canada	a	0.48	a	22	17
Czech Republic	11	0.55	4	16	52
Denmark	16	0.28	a	0	20
Finland	16	0.32	a	0	11
France	15	0.69	3	9	m
Germany	10	0.63	3	30	75
Greece	15	0.46	2	27	54
Hungary	11	0.59	4	30	71
Iceland	16	0.00	a	0	7
Ireland	15	0.84	3	2	17
Italy	14	0.52	3	0	51
Japan	15	0.00	3	26	37
Korea	14	0.13	2	35	20
Luxembourg	13	0.70	3	18	33
Mexico	12	0.79	4	40	43
Netherlands	12	0.60	5	20	m
New Zealand	a	0.35	a	0	20
Norway	16	0.11	a	m	13
Poland	15	m	3	27	67
Portugal	15	0.95	2	5	38
Spain	16	0.50	a	0	16
Sweden	16	0.15	a	0	9
Switzerland	15	0.50	4	2	49
United Kingdom	a	0.50	a	5	22
United States	a	0.55	a	0	35

a: not applicable.

m: missing data.

1. Pre-vocational programmes are defined as education mainly designed as an introduction to the world of work and as preparation for further vocational or technical education. Different from vocational programmes, pre-vocational programmes do not lead to a labour-market relevant qualification.

2. As measured by the standard deviation of grade levels among the 15-year-old students that were assessed by PISA.

Source: OECD PISA database at www.pisa.oecd.org; OECD (1999); OECD (2001b).

also be considered as a form of differentiation in that it seeks to adapt curriculum content to student performance.²³

It is difficult to define these measures of differentiation in ways that are cross-nationally comparable and interpretable. However, the analysis shows that these indicators are highly interrelated so that it is possible to combine them into an index of educational institutional differentiation.²⁴ This index can then be related to the impact that the social background of students has on student performance. This analysis shows that the total effect of differentiation on the relationship between

social background and student reading performance is 0.55, as measured by the standardised regression coefficient. The extent of institutional differentiation is thus a strong predictor of the impact that family background has on student performance.

23. In PISA, grade repetition was estimated indirectly by calculating the standard deviation in the grade levels reported by students for each of the countries. Note that this measure also captures the degree to which students enter school earlier or later than the statutory entry age and may therefore overstate apparent grade repetition.

24. For the purpose of this analysis, the normalised components were added with equal weight.

The more differentiated and selective an education system is, the larger are the typical performance differences between students from more and less advantaged family backgrounds. This is true for the various aspects of family background that were measured by PISA, and it remains true even when control variables such as national income are taken into account. As a result, both overall variation in student performance and performance differences between schools tend to be greater in those countries with explicit differentiation between types of programme and schools at an early age.

The question remains whether differentiation might still contribute to raising overall performance levels. This question cannot be answered conclusively with a cross-sectional survey such as PISA. However, it is striking that the three best performing countries – Finland, Japan and Korea – show a very moderate degree of institutional differentiation combined with a consistently high level of student performance across schools and among students from different family backgrounds. By contrast, among the countries with a high degree of institutional differentiation, only Austria and the Flemish Community of Belgium perform significantly above the OECD average.

An explanation for these results is not straightforward. There is no intrinsic reason why institutional differentiation should necessarily lead to greater variation in student performance, or even to greater social selectivity. If teaching homogeneous groups of students is more efficient than teaching heterogeneous groups, this should increase the overall level of student performance rather than the dispersion of scores. However, in homogeneous environments, while the high performing students may profit from the wider opportunities to learn from one another, and stimulate each other's performance, the low performers may not be able to access effective models and support. It may also be that in highly differentiated systems it is easier to move students not meeting certain performance standards to other schools, tracks or streams with lower performance expectations, rather than investing the effort to raise their performance. Finally, it could be that a learning environment that has a greater variety of student abilities and backgrounds may stimulate teachers to use approaches that involve a higher degree of individual attention for students.

It is difficult to discern conclusive evidence for these possible explanations from PISA. However, it is noteworthy that the majority of the countries in which students report a comparatively low level of individual support from their teachers are also those with a particularly high degree of institutional differentiation.²⁵

These arguments alone still do not explain the greater social selectivity of differentiated school systems that PISA 2000 demonstrates. Even if institutional differentiation leads to more variation in student performance, it does not necessarily increase the gap in performance between students from advantaged and disadvantaged backgrounds. One possible explanation is that more homogeneous learning environments for low performing students decrease the aspirations of parents and children from lower socio-economic backgrounds, and increase the aspirations of families from higher socio-economic backgrounds. In other words, the very existence of a highly differentiated system may signal to students and parents from lower socio-economic backgrounds what to expect from school.

The reason why the age at which differentiation begins is closely associated with social selectivity may be easier to explain. Students are more dependent upon their parents and their parental resources when they are younger and, in systems with a high degree of educational differentiation, parents from higher socio-economic backgrounds are in a better position to promote their children's chances than in a system in which such decisions are taken at a later age, and students themselves play a bigger role.

5. CONCLUSION

The PISA 2000 assessments of performance by 15-year-olds revealed wide differences among countries, and between schools and students within countries. Countries varied both in their average performance,

25. In the Czech Republic, Germany, Italy and Luxembourg, for example, at least 51% of students say that their teachers of the language of assessment never show interest in every student's learning or do so only in some lessons (as opposed to most lessons or every lesson), at least 27% of students say that their teachers never or only in some lessons provide an opportunity for students to express their opinions, and 58% or more of students say that their teachers never or only in some lessons help them with their learning. For a further analysis of the relationship between teacher support and student performance, see OECD (2001a).

and in the extent of spread around the average. They also differed in the extent to which family background shaped student performance.

A number of countries managed to combine high levels of performance with a relatively narrow range of differences among students. The performance of such countries provides considerable grounds for optimism. The results achieved by students in countries such as Finland, Canada, Korea and Japan indicate that it is possible to combine high performance standards with an equitable distribution of learning outcomes. Quality and equity do not have to be seen as competing policy objectives.

However, even the countries that performed well overall in the 2000 PISA assessments have areas for concern. In almost all countries there is a significant minority of students who performed at reading literacy Level I or below. Such students may struggle not just in school, but will find it difficult to make their way successfully in the world beyond school. In no single country does students' home background fail to have an influence on their school performance, but in some countries this influence is much less marked than in others.

A study such as PISA cannot, on its own, provide clear-cut answers on the factors that explain different levels of student, school and national performance, or the strategies that countries should use. However, one of the great advantages of cross-national studies is that they can show countries their areas of relative strength and weakness, and stimulate debate about current policies and practices.

In seeking to lift overall performance, and to reduce the impact of socio-economic background,

the PISA results provide a number of policy pointers. Important among these are building students' engagement with reading and school more generally, focusing on learning outcomes rather than educational inputs, providing schools with the authority for organising their own programmes – and holding them accountable for the results – and reducing the extent of social and educational differentiation among schools.

The PISA results also pose important questions for deeper investigation. For example, the strength of the findings on student engagement challenge school systems and researchers to delve more deeply into the motivational factors that make learning more effective – and how those factors can be developed. The strong association between student performance and structural differentiation in schooling challenges systems that stream students from a relatively early age to better understand the social and educational processes that are at work.

Such issues will be pursued in many different ways in the context of each country. But in addition, PISA itself is an ongoing process that aims progressively to develop a richer knowledge base with greater explanatory value. Future developments in PISA will help to deepen our understanding of the ways in which system policies and school practices affect the performance of students from different social backgrounds. The PISA assessments are being administered in 12 more non-OECD countries during 2002, and in 2003 the second full round of assessments will be conducted with an expanded range of learning areas. At both international and national levels research studies are underway to add further to the knowledge base in this area of prime policy importance.

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Data for the Figures

CHAPTER 2

Data for Figure 2.1

Percentage of students performing at each proficiency level on the PISA reading literacy scale, PISA 2000

	PISA reading literacy proficiency levels											
	Below Level 1 (less than 335 score points)		Level 1 (from 335 to 407 score points)		Level 2 (from 408 to 480 score points)		Level 3 (from 481 to 552 score points)		Level 4 (from 553 to 625 score points)		Level 5 (above 625 score points)	
	Percentage	S.E.	Percentage	S.E.	Percentage	S.E.	Percentage	S.E.	Percentage	S.E.	Percentage	S.E.
Australia	3.3	(0.5)	9.1	(0.8)	19.0	(1.1)	25.7	(1.1)	25.3	(0.9)	17.6	(1.2)
Austria	4.4	(0.4)	10.2	(0.6)	21.7	(0.9)	29.9	(1.2)	24.9	(1.0)	8.8	(0.8)
Belgium	7.7	(1.0)	11.3	(0.7)	16.8	(0.7)	25.8	(0.9)	26.3	(0.9)	12.0	(0.7)
Canada	2.4	(0.3)	7.2	(0.3)	18.0	(0.4)	28.0	(0.5)	27.7	(0.6)	16.8	(0.5)
Czech Republic	6.1	(0.6)	11.4	(0.7)	24.8	(1.2)	30.9	(1.1)	19.8	(0.8)	7.0	(0.6)
Denmark	5.9	(0.6)	12.0	(0.7)	22.5	(0.9)	29.5	(1.0)	22.0	(0.9)	8.1	(0.5)
Finland	1.7	(0.5)	5.2	(0.4)	14.3	(0.7)	28.7	(0.8)	31.6	(0.9)	18.5	(0.9)
France	4.2	(0.6)	11.0	(0.8)	22.0	(0.8)	30.6	(1.0)	23.7	(0.9)	8.5	(0.6)
Germany	9.9	(0.7)	12.7	(0.6)	22.3	(0.8)	26.8	(1.0)	19.4	(1.0)	8.8	(0.5)
Greece	8.7	(1.2)	15.7	(1.4)	25.9	(1.4)	28.1	(1.7)	16.7	(1.4)	5.0	(0.7)
Hungary	6.9	(0.7)	15.8	(1.2)	25.0	(1.1)	28.8	(1.3)	18.5	(1.1)	5.1	(0.8)
Iceland	4.0	(0.3)	10.5	(0.6)	22.0	(0.8)	30.8	(0.9)	23.6	(1.1)	9.1	(0.7)
Ireland	3.1	(0.5)	7.9	(0.8)	17.9	(0.9)	29.7	(1.1)	27.1	(1.1)	14.2	(0.8)
Italy	5.4	(0.9)	13.5	(0.9)	25.6	(1.0)	30.6	(1.0)	19.5	(1.1)	5.3	(0.5)
Japan	2.7	(0.6)	7.3	(1.1)	18.0	(1.3)	33.3	(1.3)	28.8	(1.7)	9.9	(1.1)
Korea	0.9	(0.2)	4.8	(0.6)	18.6	(0.9)	38.8	(1.1)	31.1	(1.2)	5.7	(0.6)
Luxembourg	14.2	(0.7)	20.9	(0.8)	27.5	(1.3)	24.6	(1.1)	11.2	(0.5)	1.7	(0.3)
Mexico	16.1	(1.2)	28.1	(1.4)	30.3	(1.1)	18.8	(1.2)	6.0	(0.7)	0.9	(0.2)
New Zealand	4.8	(0.5)	8.9	(0.5)	17.2	(0.9)	24.6	(1.1)	25.8	(1.1)	18.7	(1.0)
Norway	6.3	(0.6)	11.2	(0.8)	19.5	(0.8)	28.1	(0.8)	23.7	(0.9)	11.2	(0.7)
Poland	8.7	(1.0)	14.6	(1.0)	24.1	(1.4)	28.2	(1.3)	18.6	(1.3)	5.9	(1.0)
Portugal	9.6	(1.0)	16.7	(1.2)	25.3	(1.0)	27.5	(1.2)	16.8	(1.1)	4.2	(0.5)
Spain	4.1	(0.5)	12.2	(0.9)	25.7	(0.7)	32.8	(1.0)	21.1	(0.9)	4.2	(0.5)
Sweden	3.3	(0.4)	9.3	(0.6)	20.3	(0.7)	30.4	(1.0)	25.6	(1.0)	11.2	(0.7)
Switzerland	7.0	(0.7)	13.3	(0.9)	21.4	(1.0)	28.0	(1.0)	21.0	(1.0)	9.2	(1.0)
United Kingdom	3.6	(0.4)	9.2	(0.5)	19.6	(0.7)	27.5	(0.9)	24.4	(0.9)	15.6	(1.0)
United States	6.4	(1.2)	11.5	(1.2)	21.0	(1.2)	27.4	(1.3)	21.5	(1.4)	12.2	(1.4)
OECD average	6.0	(0.1)	11.9	(0.2)	21.7	(0.2)	28.7	(0.2)	22.3	(0.2)	9.5	(0.1)
Non-OECD countries												
Brazil	23.3	(1.4)	32.5	(1.2)	27.7	(1.3)	12.9	(1.1)	3.1	(0.5)	0.6	(0.2)
Latvia	12.7	(1.3)	17.9	(1.3)	26.3	(1.1)	25.2	(1.3)	13.8	(1.1)	4.1	(0.6)
Liechtenstein	7.6	(1.5)	14.5	(2.1)	23.2	(2.9)	30.1	(3.4)	19.5	(2.2)	5.1	(1.6)
Russian Federation	9.0	(1.0)	18.5	(1.1)	29.2	(0.8)	26.9	(1.1)	13.3	(1.0)	3.2	(0.5)

Data for the Netherlands were not included because the response rate was too low to ensure comparability.

Source: OECD PISA database at www.pisa.oecd.org

Data for Figure 2.2

Student performance on the PISA reading literacy scale and expenditure per student, OECD countries

	Performance on the reading literacy scale		Cumulative expenditure on educational institutions per student from 6 to 15 years of age (US dollars ¹) (1998)
	Mean score	S.E.	
Australia	528	(3.5)	44 623
Austria	507	(2.4)	71 387
Belgium	507	(3.6)	46 338
Czech Republic	492	(2.4)	21 384
Denmark	497	(2.4)	65 794
Finland	546	(2.6)	45 363
France	505	(2.7)	50 481
Germany	484	(2.5)	41 978
Greece	474	(5.0)	27 356
Hungary	480	(4.0)	20 277
Ireland	527	(3.2)	31 015
Italy	487	(2.9)	60 824
Japan	522	(5.2)	53 255
Korea	525	(2.4)	30 844
Mexico	422	(3.3)	11 239
Norway	505	(2.8)	61 677
Poland	479	(4.5)	16 154
Portugal	470	(4.5)	36 521
Spain	493	(2.7)	36 699
Sweden	516	(2.2)	53 386
Switzerland	494	(4.3)	64 266
United Kingdom	523	(2.6)	42 793
United States	504	(7.1)	67 313

1. US dollars converted using PPPs.

Source: OECD PISA database at www.pisa.oecd.org; OECD (2001b).

Data for Figure 2.3

Performance in reading and the impact of family background, OECD countries, PISA 2000

	Performance on the PISA reading literacy scale ²				Mean PISA socio-economic index of occupational status ¹				Score point difference associated with one unit on the index of economic, cultural and social status ^{1,2}		Difference between 95 th and 5 th percentile of the ESCS
	Mean score	S.E.	Standard deviation	S.E.	Bottom quarter	S.E.	Top quarter	S.E.	Difference	S.E.	
Australia	528	(3.5)	102	(1.6)	31.1	(0.2)	73.2	(0.3)	46	(2.36)	2.9
Austria	507	(2.4)	93	(1.6)	32.9	(0.2)	69.1	(0.3)	41	(2.26)	2.7
Belgium	507	(3.6)	107	(2.4)	28.4	(0.1)	71.8	(0.2)	48	(2.35)	3.1
Canada	534	(1.6)	95	(1.1)	31.3	(0.1)	72.9	(0.1)	37	(1.31)	2.8
Czech Republic	492	(2.4)	96	(1.9)	31.2	(0.2)	66.1	(0.3)	50	(2.22)	2.7
Denmark	497	(2.4)	98	(1.8)	29.0	(0.2)	71.1	(0.3)	42	(2.07)	2.8
Finland	546	(2.6)	89	(2.6)	29.7	(0.2)	71.8	(0.2)	30	(2.40)	2.9
France	505	(2.7)	92	(1.7)	27.7	(0.2)	71.2	(0.3)	47	(2.17)	2.9
Germany	484	(2.5)	111	(1.9)	30.0	(0.2)	70.2	(0.2)	60	(3.44)	2.8
Greece	474	(5.0)	97	(2.7)	25.6	(0.3)	72.3	(0.4)	38	(3.05)	3.3
Hungary	480	(4.0)	94	(2.1)	30.4	(0.2)	71.5	(0.2)	53	(2.89)	2.9
Iceland	507	(1.5)	92	(1.4)	31.4	(0.2)	73.8	(0.2)	24	(2.05)	2.8
Ireland	527	(3.2)	94	(1.7)	28.5	(0.2)	69.4	(0.2)	38	(2.22)	2.9
Italy	487	(2.9)	91	(2.7)	28.5	(0.1)	68.9	(0.4)	32	(2.35)	3.1
Japan	522	(5.2)	86	(3.0)	m	m	m	m	21	(2.87)	2.6
Korea	525	(2.4)	70	(1.6)	26.5	(0.1)	62.9	(0.5)	21	(2.37)	2.9
Luxembourg	441	(1.6)	100	(1.5)	25.1	(0.1)	66.1	(0.4)	46	(1.69)	3.4
Mexico	422	(3.3)	86	(2.1)	24.4	(0.1)	66.5	(0.5)	35	(2.47)	4.4
New Zealand	529	(2.8)	108	(2.0)	30.5	(0.3)	73.6	(0.2)	45	(2.27)	3.1
Norway	505	(2.8)	104	(1.7)	35.6	(0.2)	73.9	(0.2)	41	(1.83)	2.9
Poland	479	(4.5)	100	(3.1)	27.3	(0.2)	67.0	(0.4)	36	(3.40)	3.2
Portugal	470	(4.5)	97	(1.8)	26.8	(0.2)	65.7	(0.5)	40	(2.09)	3.6
Spain	493	(2.7)	85	(1.2)	26.8	(0.1)	67.3	(0.5)	32	(1.52)	3.3
Sweden	516	(2.2)	92	(1.2)	30.4	(0.2)	72.1	(0.2)	36	(1.86)	2.7
Switzerland	494	(4.3)	102	(2.0)	29.3	(0.2)	71.9	(0.3)	49	(2.24)	3.0
United Kingdom	523	(2.6)	100	(1.5)	30.7	(0.2)	71.8	(0.2)	49	(1.87)	2.9
United States	504	(7.1)	105	(2.7)	30.3	(0.2)	72.5	(0.3)	48	(2.75)	3.3
OECD average	500	(0.6)	100	(0.4)	29.3	(0.0)	70.2	(0.1)	41	(0.97)	3.0

ESCS: economic, social and cultural status.

m: missing data.

1. For the definition of these indices, see OECD (2001a).

2. Values marked in bold are statistically significantly different from the OECD average.

Source: OECD PISA database at www.pisa.oecd.org; OECD (2001a).

Data for Figure 2.4

Percentage of students enrolled in schools which have at least some responsibility for the following aspects of school policy and management, OECD countries, PISA 2000

Results based on reports from school principals and reported proportionate to the number of 15-year-olds enrolled in the school

	Performance on the PISA reading literacy scale		Appointing teachers		Dismissing teachers		Establishing teachers' starting salaries		Determining teachers' salary increases		Formulating the school budget	
	Mean score	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
Australia	528	(3.5)	60	(2.2)	47	(3.1)	18	(2.2)	19	(2.6)	96	(1.5)
Austria	507	(2.4)	15	(2.9)	5	(1.7)	1	(0.5)	1	(0.5)	14	(2.7)
Belgium	507	(3.6)	96	(1.3)	95	(1.4)	7	(1.7)	7	(1.8)	98	(1.0)
Canada	534	(1.6)	82	(1.2)	61	(1.7)	34	(1.8)	34	(1.7)	77	(1.4)
Czech Republic	492	(2.4)	96	(1.2)	95	(1.3)	70	(3.1)	73	(3.1)	83	(2.6)
Denmark	497	(2.4)	97	(1.3)	57	(3.2)	13	(2.5)	15	(2.7)	89	(2.2)
Finland	546	(2.6)	35	(3.8)	21	(3.3)	1	(0.8)	2	(1.0)	56	(3.9)
France	505	(2.7)	m	m	m	m	m	m	m	m	m	m
Germany	484	(2.5)	10	(2.3)	4	(1.3)	2	(0.9)	11	(2.2)	13	(2.0)
Greece	474	(5.0)	65	(4.7)	70	(4.4)	73	(4.3)	77	(3.9)	87	(3.4)
Hungary	480	(4.0)	100	(0.0)	99	(1.0)	41	(4.3)	50	(4.3)	61	(4.1)
Iceland	507	(1.5)	99	(0.0)	99	(0.1)	4	(0.1)	7	(0.1)	76	(0.2)
Ireland	527	(3.2)	88	(2.5)	73	(3.0)	4	(1.7)	5	(2.2)	79	(3.1)
Italy	487	(2.9)	10	(2.1)	11	(2.6)	1	(0.8)	1	(0.8)	94	(2.4)
Japan	522	(5.2)	33	(1.9)	32	(2.0)	32	(2.0)	32	(2.0)	50	(3.3)
Korea	525	(2.4)	32	(4.1)	22	(4.0)	15	(3.1)	7	(2.4)	88	(2.5)
Luxembourg	441	(1.6)	m	m	m	m	m	m	m	m	100	(0.0)
Mexico	422	(3.3)	57	(3.4)	48	(3.8)	26	(3.1)	28	(3.1)	68	(4.2)
New Zealand	529	(2.8)	100	(0.0)	99	(0.8)	17	(2.4)	41	(3.3)	98	(1.1)
Norway	505	(2.8)	m	m	m	m	m	m	m	m	m	m
Poland	479	(4.5)	m	m	m	m	m	m	m	m	m	m
Portugal	470	(4.5)	13	(2.1)	9	(1.2)	1	(0.7)	1	(0.7)	89	(2.9)
Spain	493	(2.7)	38	(2.5)	39	(2.6)	9	(2.2)	9	(2.2)	90	(2.5)
Sweden	516	(2.2)	99	(0.8)	83	(3.2)	62	(3.6)	74	(3.6)	85	(3.1)
Switzerland	494	(4.3)	93	(1.7)	82	(2.3)	13	(2.7)	15	(3.0)	54	(3.3)
United Kingdom	523	(2.6)	99	(0.3)	89	(1.3)	72	(3.0)	70	(3.1)	92	(0.8)
United States	504	(7.1)	97	(0.9)	98	(1.2)	76	(4.9)	74	(5.1)	96	(1.9)
OECD average	500	(0.6)	61	(0.4)	54	(0.5)	23	(0.5)	26	(0.5)	76	(0.6)
Cross-country correlation between country's average achievement on the reading literacy scale and the percentage of students ¹												
			0.16		0.10		-0.05		-0.06		0.00	
Netherlands ²			100	(0.0)	100	(0.0)	71	(5.0)	45	(5.6)	100	(0.0)

m: missing data.

1. Correlation values indicated in bold are statistically significant.

2. Response rate is too low to ensure comparability.

Source: OECD PISA database at www.pisa.oecd.org; OECD (2001a).

Data for Figure 2.4 (continued)

Percentage of students enrolled in schools which have at least some responsibility for the following aspects of school policy and management, OECD countries, PISA 2000

Results based on reports from school principals and reported proportionate to the number of 15-year-olds enrolled in the school

	Deciding on budget allocations within the school		Establishing student disciplinary policies		Establishing student assessment policies		Approving students for admittance to school		Choosing which textbooks are used		Determining course content		Deciding which courses are offered	
	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
Australia	100	(0.2)	100	(0.2)	99	(0.6)	94	(1.6)	100	(0.2)	84	(3.2)	96	(1.8)
Austria	93	(2.0)	96	(1.6)	69	(3.5)	75	(2.9)	99	(0.7)	54	(3.6)	57	(3.7)
Belgium	99	(0.6)	99	(0.9)	100	(0.4)	95	(1.7)	99	(0.6)	59	(3.7)	61	(3.6)
Canada	99	(0.3)	98	(0.5)	94	(1.0)	89	(1.0)	89	(0.9)	49	(1.8)	90	(1.1)
Czech Republic	99	(0.6)	100	(0.5)	100	(0.3)	89	(1.7)	100	(0.0)	82	(2.9)	82	(2.8)
Denmark	98	(1.0)	99	(0.8)	87	(2.4)	87	(2.6)	100	(0.0)	90	(1.9)	77	(2.6)
Finland	99	(0.9)	96	(1.9)	89	(2.6)	54	(4.0)	100	(0.0)	91	(2.3)	95	(2.0)
France	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Germany	96	(1.3)	95	(1.4)	79	(2.8)	79	(3.0)	96	(1.7)	35	(3.3)	35	(3.4)
Greece	95	(2.1)	97	(1.5)	94	(2.2)	90	(2.5)	90	(2.9)	92	(2.6)	89	(2.9)
Hungary	92	(2.3)	100	(0.0)	98	(1.0)	99	(0.7)	100	(0.4)	97	(1.3)	98	(1.0)
Iceland	87	(0.1)	99	(0.0)	98	(0.1)	74	(0.1)	99	(0.0)	79	(0.2)	62	(0.2)
Ireland	100	(0.0)	99	(0.6)	99	(0.9)	95	(2.0)	100	(0.0)	37	(4.1)	97	(1.3)
Italy	57	(5.0)	100	(0.0)	100	(0.0)	63	(5.1)	100	(0.0)	93	(2.9)	22	(4.0)
Japan	91	(2.9)	100	(0.4)	100	(0.0)	100	(0.0)	99	(0.7)	99	(0.7)	98	(1.3)
Korea	95	(1.7)	100	(0.0)	99	(0.1)	97	(1.4)	99	(0.6)	99	(0.6)	93	(2.3)
Luxembourg	100	(0.0)	m	m	m	m	100	(0.0)	m	m	m	m	m	m
Mexico	77	(3.7)	99	(0.7)	92	(2.5)	86	(2.3)	81	(3.0)	59	(4.1)	58	(3.4)
New Zealand	100	(0.0)	100	(0.0)	100	(0.0)	94	(1.2)	100	(0.0)	87	(2.7)	100	(0.1)
Norway	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Poland	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Portugal	95	(2.0)	92	(2.2)	88	(2.6)	85	(3.1)	100	(0.0)	20	(3.4)	54	(4.5)
Spain	98	(1.3)	99	(0.8)	97	(1.5)	89	(2.4)	100	(0.4)	86	(2.9)	54	(3.8)
Sweden	99	(0.6)	100	(0.0)	97	(1.5)	54	(4.0)	100	(0.0)	88	(2.8)	76	(3.7)
Switzerland	87	(2.9)	98	(1.2)	75	(3.6)	82	(3.0)	51	(4.1)	29	(3.5)	34	(3.4)
United Kingdom	100	(0.1)	99	(0.5)	100	(0.2)	66	(3.6)	100	(0.0)	94	(1.5)	100	(0.1)
United States	99	(1.0)	99	(0.9)	93	(2.2)	89	(2.6)	92	(3.0)	84	(4.3)	97	(1.3)
OECD average	94	(0.3)	95	(0.2)	89	(0.4)	84	(0.5)	92	(0.2)	69	(0.6)	71	(0.6)
Cross-country correlation between country's average achievement on the reading literacy scale and the percentage of students ¹														
	0.37		0.21		0.20		-0.21		0.30		0.25		0.51	
Netherlands ²	100	(0.0)	100	(0.0)	100	(0.0)	100	(0.0)	100	(0.0)	92	(3.2)	95	(2.4)

m: missing data.

1. Correlation values indicated in bold are statistically significant.

2. Response rate is too low to ensure comparability.

Source: OECD PISA database at www.pisa.oecd.org; OECD (2001a).

Data for Figure 2.5

Variations in reading literacy performance between and within schools, OECD countries, PISA 2000

	Total variation in student performance ¹	Variation expressed as a percentage of the average variation in student performance across the OECD countries				
		Total variation in student performance expressed as a percentage of the average variation in student performance across OECD countries	Proportion of average variation in student performance that lies between schools	Proportion of average variation in student performance that lies within schools	Percentage of between-school variance that is explained by socio-economic background factors	Percentage of within-school variance that is explained by socio-economic background factors
Australia	10 357	111.6	20.9	90.6	64	16
Austria	8 649	93.2	68.6	45.7	28	5
Belgium	11 455	123.5	76.0	50.9	31	9
Canada	8 955	96.5	17.1	80.1	42	14
Czech Republic	9 278	100.0	51.9	45.3	43	11
Denmark	9 614	103.6	19.6	85.9	58	18
Finland	7 994	86.2	10.7	76.5	18	20
France	m	m	m	m	m	m
Germany	12 368	133.3	74.8	50.2	27	12
Greece	9 436	101.7	53.8	52.9	25	8
Hungary	8 810	95.0	71.2	34.8	25	4
Iceland	8 529	91.9	7.0	85.0	31	12
Ireland	8 755	94.4	17.1	79.2	59	12
Italy	8 356	90.1	50.9	43.4	19	3
Japan ²	7 358	79.3	36.5	43.9	11	3
Korea	4 833	52.1	19.7	33.0	17	3
Luxembourg	10 088	108.7	33.4	74.9	54	21
Mexico	7 370	79.4	42.9	37.4	31	4
New Zealand	11 701	126.1	20.1	103.9	70	19
Norway	10 743	115.8	12.6	102.4	48	20
Poland	9 958	107.3	67.0	38.9	10	2
Portugal	9 436	101.7	37.5	64.3	43	14
Spain	7 181	77.4	15.9	60.9	59	12
Sweden	8 495	91.6	8.9	83.0	73	17
Switzerland	10 408	112.2	48.7	63.7	35	18
United Kingdom	10 098	108.9	22.4	82.3	61	18
United States	10 979	118.3	35.1	83.6	61	17
OECD average	9 277	100.0	36.2	65.1	34	14

m: missing data.

1. The total variation in student performance is obtained as the square of the standard deviation shown in the data table for Figure 2.1. The statistical variance and not the standard deviation is used for this comparison to allow for the decomposition of the components of variation in student performance.

2. Due to the sampling methods used in Japan, the between-school variance in Japan includes variation between classes within schools.

Source: OECD PISA database at www.pisa.oecd.org; OECD (2001a).

Data for Figure 2.6

Effects of student socio-economic background and school socio-economic composition on performance on the reading literacy scale, OECD countries, PISA 2000Effect of an increase of half a student-level standard deviation of the index of economic, social and cultural status¹

	Interquartile range of school mean index of economic, social and cultural status	Effect of the students' economic, social and cultural status on performance	Effect of the schools' mean economic, social and cultural status on performance
Australia	0.73	17	21
Austria	0.83	4	59
Belgium	0.97	7	56
Canada	0.60	14	22
Czech Republic	0.52	10	52
Denmark	0.54	17	22
Finland	0.44	13	8
France	m	m	m
Germany	0.63	8	66
Greece	0.75	7	39
Hungary	0.86	4	47
Iceland	0.50	11	5
Ireland	0.55	13	23
Italy	1.04	3	44
Japan ²	m	m	m
Korea	0.85	3	30
Luxembourg	0.96	12	40
Mexico	1.20	3	22
New Zealand	0.64	16	22
Norway	0.57	17	12
Poland	0.92	2	49
Portugal	0.66	11	29
Spain	0.77	10	16
Sweden	0.50	14	16
Switzerland	0.50	12	32
United Kingdom	0.93	15	29
United States	0.61	13	28
OECD average	0.72	10	32
Netherlands ³	0.66	7	57

m: missing data.

1. The effects on reading performance were estimated using a multi-level model that included gender, ethnicity, and student and school-level measures of family background ("economic, social and cultural status").

2. Data for Japan are not included in this table due to a high percentage of missing data on parental education and parental occupation.

3. Response rate is too low to ensure comparability.

Source: OECD PISA database at www.pisa.oecd.org; OECD (2001a).

EDUCATION POLICY ANALYSIS

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The *Education Policy Analysis* series was launched by the OECD in 1996. It forms part of the work programme of the OECD Education Committee, and responds to the policy priorities established by OECD Education Ministers. The series is prepared by the Education and Training Division of the OECD Directorate for Education.

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- To assist education policy-makers and others concerned with education policy to make better decisions by drawing on international and comparative work;
- To draw out the key insights and policy implications arising from OECD education activities, international data and indicators, and related studies; and
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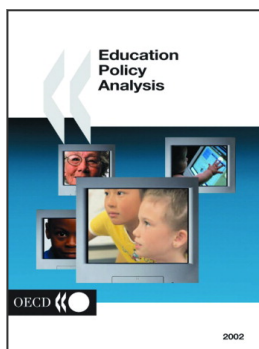
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