Chapter

A

THE OUTPUT OF EDUCATIONAL INSTITUTIONS AND THE IMPACT OF LEARNING

A

OVERVIEW

Chapter A examines the outcomes of education and learning, in terms of…

Indicator A1: Current upper secondary graduation rates and attainment of the adult population

…the current output of educational institutions and educational attainment of the adult population,…

Indicator A2: Current tertiary graduation and survival rates and attainment of the adult population

Indicator A3: Educational attainment of the labour force and adult population

Indicator A4: Graduates by field of study

…the quality of learning outcomes and how this varies among schools and students,…

Indicator A5: Reading literacy of 15-year-olds

Indicator A6: Mathematical and scientific literacy of 15-year-olds

Indicator A7: How student performance varies between schools

Indicator A8: Civic knowledge and engagement

…equity in educational opportunities and outcomes…

Indicator A9: Occupational status of parents and student performance

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Indicator A10: Place of birth, language spoken at home, and reading literacy of 15-year-olds

Table A10.1. Performance in reading literacy and country of birth of 15-year-olds and their parents (2000)
Table A10.2. Performance in reading literacy and language spoken at home of 15-year-olds (2000)

…and the returns to education for individuals and society.

Indicator A11: Labour force participation by level of educational attainment

Table A11.1. Labour force participation rates, by level of educational attainment (2001)
Table A11.2. Unemployment rates, by level of educational attainment (2001)

Indicator A12: Expected years in education, employment and non-employment between the ages of 15 and 29

Table A12.1. Expected years in education and not in education for 15 to 29-year-olds, by gender and work status (2001)

Indicator A13: The returns to education: Private and social rates of return to education and their determinants

Table A13.1. Relative earnings of the population with income from employment
Table A13.2. Differences in earnings between women and men
Table A13.3. Private internal rates of return to education (1999-2000)
Table A13.4. Social rates of return to education (1999-2000)

Indicator A14: The returns to education: Links between human capital and economic growth

Table A14.1. Decomposition of changes in annual average growth rates of GDP per capita (1980-1997)

Indicators A5, A6, A7, A9 and A10 draw on data from the Programme of International Student Assessment (PISA). Detailed information on this programme is available on the web site *www.pisa.oecd.org.*

CURRENT UPPER SECONDARY GRADUATION RATES AND ATTAINMENT OF THE ADULT POPULATION

- In the majority of OECD countries for which comparable data are available, the ratio of upper secondary graduates to the population at the typical age of graduation exceeds 70 per cent. In Germany, Hungary, Japan, Poland and the Slovak Republic, graduation rates are 90 per cent or above. The challenge now is to ensure that the remaining fraction is not left behind, with the risk of social exclusion that this may entail.

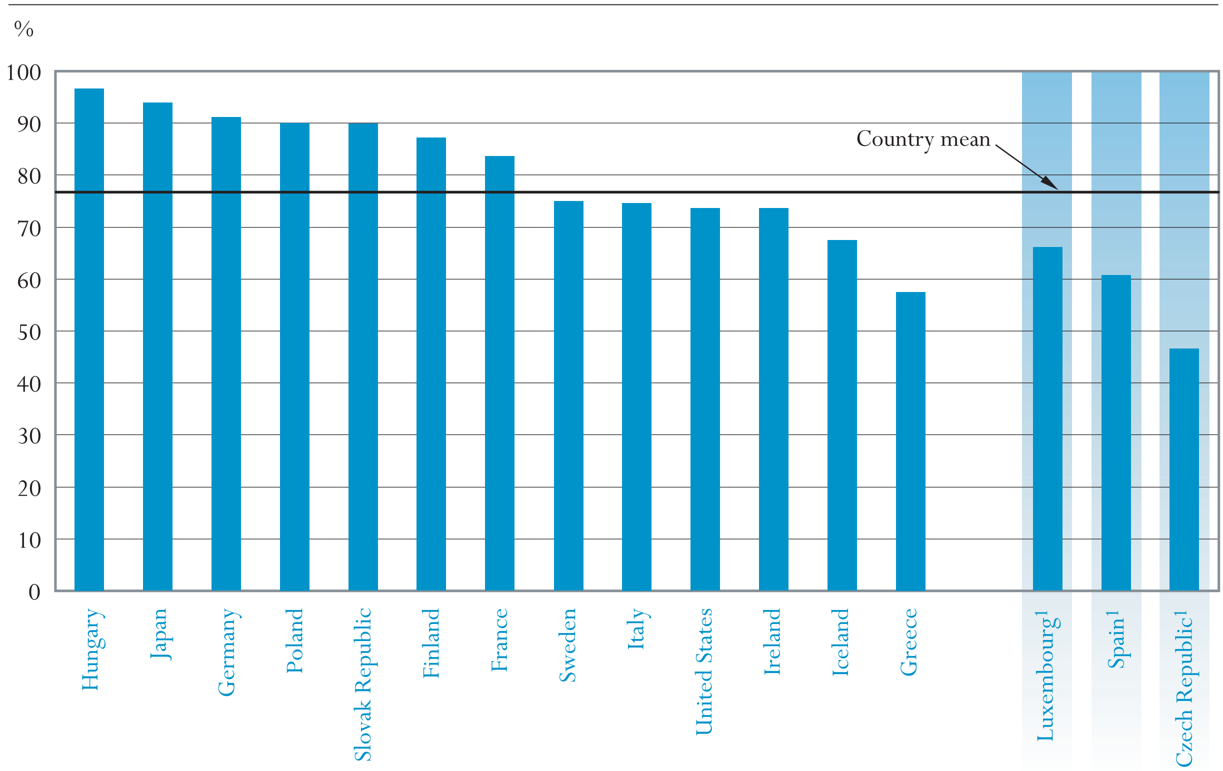
- Comparing the attainment of the population aged 25 to 34 years with that of the population aged 45 to 54 shows that the proportion of individuals who have not completed upper secondary education has been shrinking in almost all OECD countries, and in some rapidly.

- Among older age groups, women have attained lower levels of upper secondary education than men, but for younger people the pattern is now reversing. Today, graduation rates of women exceed those of men in most countries.

Chart A1.1.

Upper secondary graduation rates (2000)

Ratio of unduplicated count of all upper secondary graduates to population at typical age of graduation



1. A significant proportion of the youth cohort is not covered by this indicator.
Countries are ranked in descending order of total upper secondary graduation rates.
Source: OECD. Table A1.1. See Annex 3 for notes *(www.oecd.org/els/education/eag2002).*

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Policy context

To gauge the share of the population that has obtained the minimum credentials for successfully entering the labour market …

Rising skill demands in OECD countries have made qualifications at the upper secondary level of education the minimum credential for successful labour market entry. Upper secondary education serves as the foundation for advanced learning and training opportunities, as well as preparation for direct entry into the labour market. Although many countries do allow students to leave the education system at the end of the lower secondary level, young people in OECD countries who leave without an upper secondary qualification tend to face severe difficulties in entering the labour market (see Indicators A11 to A14).

…this indicator shows the current upper secondary graduate output of educational institutions…

The upper secondary graduation rate reflects the current output of education systems, *i.e.*, the percentage of the typical upper secondary school age population that follow and successfully complete upper secondary programmes. Although high upper secondary graduation rates do not guarantee that an education system has adequately equipped its graduates with the basic skills and knowledge necessary to enter the labour market – this indicator does not capture the quality of educational outcomes – it is one indication of the extent to which education systems succeed in meeting the minimum requirements of the labour market.

…as well as historical patterns of upper secondary completion.

By comparing educational attainment levels between different generations one can identify the evolution of education levels within the population, reflecting both changing demands of the labour market and changing educational policies.

Evidence and explanations

In 11 out of 13 OECD countries with comparable data, upper secondary graduation rates exceed 70 per cent…

Upper secondary graduation rates are estimated as the number of persons, regardless of their age, who graduate for the first time from upper secondary programmes per 100 people at the age at which students typically graduate from upper secondary education (see Annex 1). The graduation rates take into account students graduating from upper secondary education at the modal or typical graduation ages, and older students (*e.g.*, those in "second chance" programmes). In 11 out of 13 of the OECD countries with comparable data, upper secondary graduation rates exceed 70 per cent (Chart A1.1).

…and in Germany, Hungary, Japan, Poland and the Slovak Republic they are 90 per cent or above.

In five of the 13 countries for which comparable numbers of graduates are available, graduation rates are 90 per cent or above (Germany, Hungary, Japan, Poland and the Slovak Republic). Caution should be used in interpreting the graduation rates displayed in Chart A1.1 for the following countries: In the Czech Republic and Spain, the length of secondary programmes was recently extended, which leads to an underestimation of graduation rates, and many Luxembourg nationals study in neighbouring countries.

Some countries provide "second chance" opportunities for obtaining upper secondary credentials by offering examinations rather than providing upper secondary programmes for adults. In the United States, students who do not successfully complete the last year of upper secondary education – a

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relatively large proportion – often take and pass a test of General Educational Development (GED) at a later point in time. This qualification is formally regarded as the equivalent of an upper secondary qualification.

Upper secondary attainment levels have increased in almost all countries…

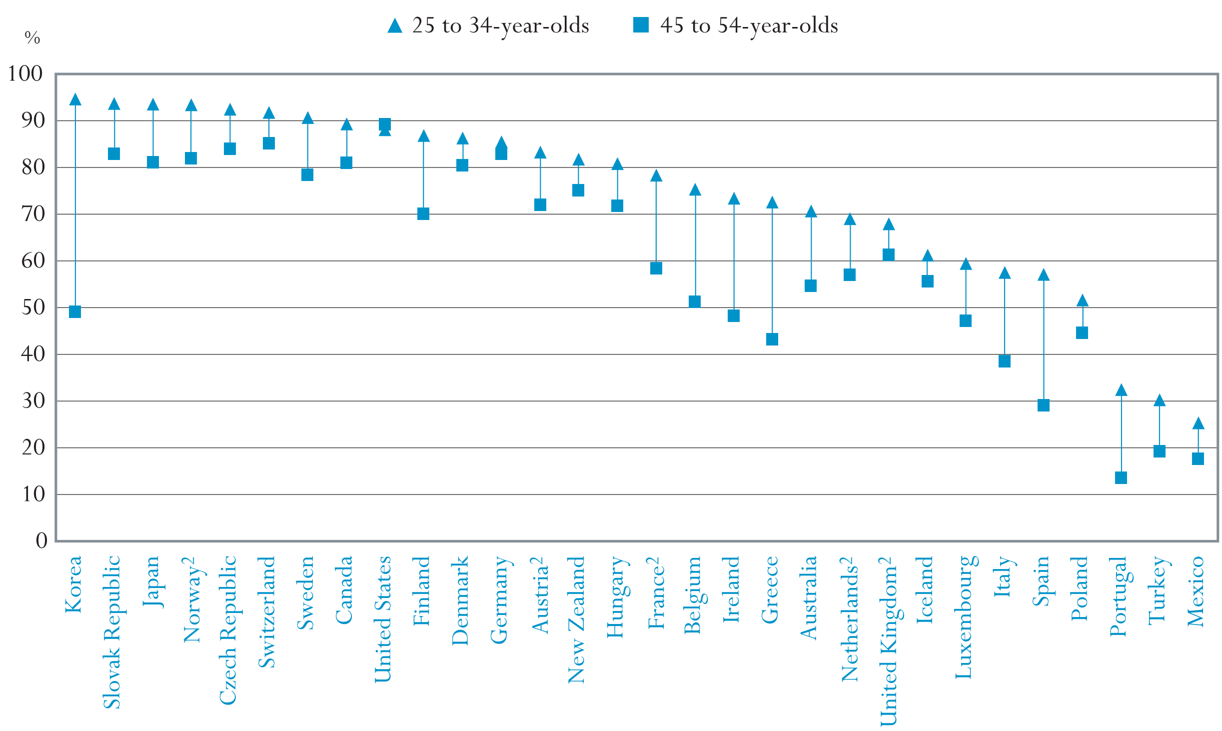
A comparison of the levels of educational attainment between older and younger age groups indicates marked progress with regard to the percentage of the population graduating from upper secondary education (Chart A1.2). On average, only 60 per cent of 45 to 54 year-olds have attained an upper secondary level of education, compared to 74 per cent of 25 to 34-year-olds.

…and many countries with traditionally low levels of education are catching up.

This is especially striking in countries whose adult population generally has a lower attainment level. In younger age groups, differences between countries in the level of educational attainment are less pronounced. As a result, many countries currently showing low attainment in the adult population are expected to move closer to those with higher attainment levels. In Korea, Portugal and Spain, the proportion of individuals aged 25 to 34 with at least upper secondary attainment is around twice as high as that in the age group 45 to 54.

Chart A1.2.

Percentage of the population that has attained at least upper secondary education[1], by age group (2001)



Note: Not all ISCED 3 programmes meet minimum requirements for ISCED 3C long programmes. See Annex 3 for notes.
1. Excluding ISCED 3C short programmes.
2. Year of reference 2000.
Countries are ranked in descending order of the percentage of 25 to 34-year-olds who have attained at least upper secondary education.
Source: OECD. Table A1.2. See Annex 3 for a description of ISCED-97 levels, ISCED-97 country mappings and national data sources *(www.oecd.org/els/education/eag2002).*

Gender differences in graduation rates

Among older age groups, women have lower levels of education than men…

The balance of educational attainment among men and women in the adult population is unequal in most OECD countries: historically women did not have sufficient opportunities and/or incentives to reach the same level of education as men. Women are generally over-represented among those who did not proceed to upper secondary education and under-represented at the higher levels of education (see also Indicator A3).

…but for younger people the pattern is now reversing.

However, these differences are mostly attributable to the large gender differences in the attainment of older age groups and have been significantly reduced or reversed among younger age groups.

Today, graduation rates for women exceed those for men in most countries.

Today, graduation rates no longer show significant differences between men and women in half of the countries with available data (Table A1.1). Further, in 14 out of 16 OECD countries for which upper secondary graduation rates can be compared between the genders, graduation rates for women exceed those for men in Finland, Greece, Iceland, Ireland, Italy and Spain by 10 percentage points or more. In the majority of OECD countries, the gender ratio for upper secondary programmes designed to lead to further tertiary-type A education (ISCED 3A) strongly favours women, only in Korea and Turkey do more men graduate than women.

Graduation from post-secondary non-tertiary programmes

In some countries, a significant proportion of students broaden their knowledge at the upper secondary level after completing a first upper secondary programme.

Post-secondary non-tertiary programmes straddle the boundary between upper secondary and post-secondary education from a comparative point of view, even though they might clearly be considered upper secondary or post-secondary programmes in a national context. Although their content may not be significantly more advanced than upper secondary programmes, they serve to broaden the knowledge of participants who have already gained an upper secondary qualification. The students tend to be older than those enrolled at the upper secondary level.

In Canada, Hungary and Ireland 28 per cent or more of a typical age cohort complete a post-secondary non-tertiary programme.

Typical examples of such programmes would be trade and vocational certificates in Canada and the United States, nursery teacher training in Austria and Switzerland or vocational training in the dual system for holders of general upper secondary qualifications in Germany. In most countries, post-secondary non-tertiary programmes are vocationally oriented.

In half of OECD countries where post-secondary non-tertiary programmes are offered, a significant proportion of upper secondary graduates also graduate from a post-secondary non-tertiary programme, either instead of or in addition to tertiary education (OECD average 9 per cent). In Canada, Hungary and Ireland, 28 per cent or more of a typical age cohort complete a post-secondary non-tertiary programme (Table A1.3).

In almost two-thirds of OECD countries with available data, the majority of post-secondary non-tertiary students graduate from ISCED 4C programmes, which are designed primarily to prepare graduates for direct entry into the labour market. Apprenticeships that are designed for students who have already graduated from an upper secondary programme are also included in this category. However, in Belgium, the Czech Republic, Germany, the Slovak Republic and Spain, the majority of post-secondary non-tertiary graduates are from ISCED 4A programmes, most of which are designed to provide direct access to tertiary-type A education.

Definitions and methodologies

Upper secondary graduates are those who successfully complete the final year of upper secondary education, regardless of their age. In some countries, successful completion requires a final examination; in others it does not.

Graduate data refer to the school year 1999-2000 and are based on the UOE data collection on education statistics that is administered annually by the OECD.

Gross graduation rates for ISCED 3A, 3B and 3C programmes cannot be added, as some individuals graduate from more than one upper secondary programme and would thus be counted twice. The same applies for graduation rates by programme orientation, *i.e.*, general or vocational. The unduplicated total count of graduates is calculated by netting out those students who graduated from another upper secondary programme in a previous year.

For some countries, an unduplicated count of post-secondary non-tertiary graduates is unavailable and graduation rates may be overestimated because graduates complete multiple programmes at the same level. These countries are marked with a footnote in Table A1.3.

Pre-vocational and vocational programmes include both school-based programmes and combined school and work-based programmes that are recognised as part of the education system. Entirely work-based education and training that is not overseen by a formal education authority is not taken into account.

Data on population and educational attainment are taken from OECD and EUROSTAT databases, which are compiled from National Labour Force Surveys. See Annex 3 at *www.oecd.org/els/education/eag2002* for national sources.

Educational attainment data derive from National Labour Force Surveys and use the International Standard Classification of Education (ISCED-97).

The attainment profiles are based on the percentage of the population aged 25 to 64 years that has completed a specified level of education. The International Standard Classification of Education (ISCED-97) is used to define the levels of education. See Annex 3 at *www.oecd.org/els/education/eag2002* for a description of ISCED-97 education levels and mappings for each country.

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Table A1.1.
Upper secondary graduation rates (2000)
Ratio of upper secondary graduates to total population at typical age of graduation (multiplied by 100) in public and private institutions, by programme destination, programme orientation and gender

	Total (unduplicated)			ISCED 3A (designed to prepare for direct entry to tertiary-type A education)		ISCED 3B (designed to prepare for direct entry to tertiary-type B education)		ISCED 3C (long) similar to duration of typical 3A or 3B programmes		ISCED 3C (short) shorter than duration of typical 3A or 3B programmes		General programmes		Pre-vocational/ Vocational programmes	
	M + F	Males	Females	M + F	Females	M + F	Females	M + F	Females	M + F	Females	M + F	Females	M + F	Females
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
OECD COUNTRIES															
Australia	m	m	m	67	73	m	m	m	m	m	m	m	m	m	m
Austria	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Belgium	m	m	m	60	64	a	a	19	19	11	15	36	40	54	57
Canada	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Czech Republic[1*]	47	50	42	18	21	n	n	a	a	31	23	8	10	41	35
Denmark	m	m	m	52	64	a	a	54	64	a	a	52	64	54	64
Finland	87	81	94	87	94	a	a	a	a	a	a	53	64	72	77
France	84	81	86	49	57	10	8	2	2	37	32	31	37	67	62
Germany	91	89	94	33	36	58	57	a	a	a	a	33	36	58	57
Greece	58	50	66	56	64	m	m	26	22	m	m	56	64	26	22
Hungary	97	98	95	58	65	1	2	x(10)	x(11)	37	28	26	32	70	62
Iceland	67	60	76	47	58	n	n	22	14	14	16	47	58	36	30
Ireland	74	67	80	74	80	a	a	5	5	a	a	59	63	20	23
Italy	75	68	81	74	80	1	1	a	a	19	18	29	39	64	60
Japan	94	92	96	69	73	1	n	24	23	x(8)	x(9)	69	73	26	24
Korea	m	m	m	60	58	a	a	37	38	a	a	60	58	37	38
Luxembourg[1*]	66	63	69	39	47	6	5	20	17	a	a	26	29	40	40
Mexico	m	m	m	28	30	a	a	4	5	x(8)	x(9)	28	30	4	5
Netherlands	m	m	m	63	68	a	a	32	29	x(8)	x(9)	37	41	57	56
New Zealand	m	m	m	65	70	45	52	12	14	x(8)	x(9)	m	m	m	m
Norway	m	m	m	64	79	a	a	52	44	m	m	64	79	52	44
Poland	90	87	94	70	78	a	a	a	a	29	21	32	41	67	58
Portugal	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Slovak Republic	90	90	90	72	80	n	n	1	1	24	17	18	21	79	77
Spain[1*]	61	54	67	46	53	n	n	9	9	13	15	46	53	22	24
Sweden	75	72	78	74	77	a	a	1	n	a	a	42	46	32	31
Switzerland	m	m	m	19	22	50	42	13	19	n	n	m	m	m	m
Turkey[*]	m	m	m	37	31	a	a	m	m	a	a	20	19	16	13
United Kingdom	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
United States	74	73	74	m	m	m	m	m	m	m	m	m	m	m	m
Country mean	*77*	*74*	*80*	*55*	*61*	*8*	*7*	*15*	*15*	*12*	*10*	*40*	*45*	*45*	*44*
NON-OECD COUNTRIES															
Argentina[2]	48	40	55	48	55	a	a	a	a	a	a	26	34	21	21
Brazil[2]	a	a	a	62	70	m	m	a	a	a	a	m	m	m	m
Chile[2]	a	a	a	34	39	28	28	a	a	a	a	34	39	28	28
China[2]	a	a	a	17	15	a	a	20	21	4	m	m	m	m	m
India	34	40	28	34	28	a	a	m	m	m	m	m	m	m	m
Indonesia[3]	a	a	a	19	20	13	11	a	a	a	a	19	20	13	11
Israel	m	m	m	59	67	26	23	3	1	a	a	59	67	26	23
Jamaica	a	a	a	65	67	n	n	a	a	a	a	65	67	n	n
Jordan	a	a	a	68	75	a	a	3	n	a	a	55	63	13	13
Malaysia[2]	m	m	m	14	19	a	a	53	63	a	a	65	81	2	1
Paraguay[2]	a	a	a	35	38	a	a	m	m	a	a	28	31	8	8
Peru[2]	a	a	a	50	50	x(4)	x(5)	a	a	a	a	41	42	9	8
Philippines[2]	a	a	a	66	72	a	a	a	a	a	a	66	72	a	a
Russian Federation[3]	a	a	a	53	m	a	a	m	m	m	m	m	m	m	m
Thailand	a	a	a	27	30	18	18	a	a	a	a	27	30	18	18
Tunisia	a	a	a	26	29	2	1	2	1	a	a	26	29	4	2
Zimbabwe[3]	a	a	a	3	3	1	1	m	m	m	m	m	m	m	m

Note: x indicates that data are included in another column. The column reference is shown in brackets after "x". *e.g.*, x(2) means that data are included in column 2.
1. Significant proportion of the youth cohort is missing.
2. Year of reference 1999.
3. Year of reference 2001.
*See Annex 3 for notes (*www.oecd.org/els/education/eag2002*).
Source: OECD.

Table A1.2.
Population that has attained at least upper secondary education (2001)
Percentage of the population that has attained at least upper secondary education[1], by age group

		Age group				
		25-64	25-34	35-44	45-54	55-64
OECD COUNTRIES	Australia	59	71	60	55	44
	Austria[2]	76	83	80	72	63
	Belgium[2]	59	75	63	51	38
	Canada	82	89	85	81	67
	Czech Republic	86	92	90	84	76
	Denmark	80	86	80	80	72
	Finland	74	87	84	70	51
	France[3]	64	78	67	58	46
	Germany	83	85	86	83	76
	Greece	51	73	60	43	28
	Hungary	70	81	79	72	44
	Iceland	57	61	60	56	46
	Ireland	58	73	62	48	35
	Italy	43	57	49	39	22
	Japan	83	94	94	81	63
	Korea	68	95	77	49	30
	Luxembourg	53	59	57	47	42
	Mexico	22	25	25	17	11
	Netherlands[2, 3]	65	74	69	60	51
	New Zealand	76	82	80	75	60
	Norway[2]	85	93	90	82	70
	Poland	46	52	48	44	36
	Portugal	20	32	20	14	9
	Slovak Republic	85	94	90	83	66
	Spain	40	57	45	29	17
	Sweden	81	91	86	78	65
	Switzerland	87	92	90	85	81
	Turkey	24	30	24	19	13
	United Kingdom[3]	63	68	65	61	55
	United States	88	88	89	89	83
	Country mean	*64*	*74*	*68*	*60*	*49*

1. Excluding ISCED 3C short programmes.
2. Year of reference 2000.
3. Not all ISCED 3 programmes meet minimum requirements for ISCED 3C long programmes. See Annex 3 for notes (*www.oecd.org/els/education/eag2002*)
Source: OECD. See Annex 3 for a description of ISCED-97 levels, ISCED-97 country mappings and national data sources (*www.oecd.org/els/education/eag2002*).

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Table A1.3.
Post-secondary non-tertiary graduation rates (2000)
Ratio of post-secondary non-tertiary graduates to total population at typical age of graduation (multiplied by 100) in public and private institutions, by programme destination and gender

		Total (unduplicated)			ISCED 4A (designed to prepare for direct entry to tertiary-type A education)		ISCED 4B (designed to prepare for direct entry to tertiary-type B education)		ISCED 4C	
		M + F	Males	Females	M + F	Females	M + F	Females	M + F	Females
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
OECD COUNTRIES	Australia	m	m	m	m	m	m	m	m	m
	Austria	m	m	m	m	m	m	m	m	m
	Belgium[1]	17.8	16.1	19.6	10.2	10.3	a	a	7.6	9.2
	Canada[1]	28.1	31.5	24.7	n	n	n	n	28.1	24.7
	Czech Republic[1]	9.0	9.7	8.2	9.0	8.2	a	a	n	n
	Denmark[1]	1.7	2.9	0.4	0.1	n	a	a	1.6	0.4
	Finland	1.5	1.6	1.4	a	a	a	a	1.9	1.9
	France[1]	1.2	0.8	1.7	0.7	0.8	a	a	0.6	0.9
	Germany	14.8	16.0	13.5	9.3	8.7	5.5	4.8	a	a
	Greece[1]	15.3	11.6	19.2	a	a	a	a	15.3	19.2
	Hungary[1]	31.2	29.1	33.5	5.8	6.1	a	a	25.3	27.2
	Iceland	6.1	8.3	3.9	a	a	a	a	6.2	4.0
	Ireland	28.9	15.1	43.4	a	a	a	a	28.9	43.4
	Italy	3.1	2.3	4.0	a	a	a	a	3.1	4.0
	Japan	m	m	m	m	m	m	m	m	m
	Korea	a	a	a	a	a	a	a	a	a
	Luxembourg[1]	3.1	4.5	1.8	a	a	a	a	3.1	1.6
	Mexico	a	a	a	a	a	a	a	a	a
	Netherlands[1]	1.0	1.5	0.4	a	a	a	a	1.0	0.4
	New Zealand[1]	2.6	1.7	3.6	n	0.1	0.2	0.2	2.3	3.3
	Norway[1]	11.4	16.4	6.2	4.8	3.2	a	a	6.6	3.0
	Poland[1]	12.6	8.4	16.9	a	a	12.6	16.9	a	a
	Portugal	m	m	m	m	m	m	m	m	m
	Slovak Republic[1]	2.2	1.3	3.1	2.2	3.1	a	a	a	a
	Spain	9.8	9.2	10.5	9.5	10.1	0.3	0.4	n	n
	Sweden	m	m	m	m	m	m	m	0.5	0.3
	Switzerland[1]	17.6	16.1	19.1	3.0	2.0	14.6	17.2	n	n
	Turkey	a	a	a	a	a	a	a	a	a
	United Kingdom	m	m	m	m	m	m	m	m	m
	United States	6.6	5.8	7.3	a	a	a	a	6.6	7.3
	Country mean	*9.4*	*8.7*	*10.1*	*2.3*	*2.2*	*1.4*	*1.7*	*5.5*	*6.0*
NON-OECD COUNTRIES	Argentina[2]	a	a	a	a	a	a	a	a	a
	Brazil[2]	a	a	a	a	a	m	m	a	a
	China[2]	a	a	a	a	a	a	a	2.0	2.0
	Indonesia[3]	a	a	a	a	a	a	a	a	a
	Jordan	a	a	a	a	a	a	a	a	a
	Malaysia[2]	m	m	m	0.6	0.6	0.7	0.2	0.3	0.3
	Paraguay[2]	a	a	a	a	a	a	a	a	a
	Peru[2]	a	a	a	a	a	a	a	m	m
	Philippines[2]	a	a	a	6.0	m	x(4)	m	x(4)	m
	Russian Federation[3]	a	a	a	a	a	a	a	32.5	22.7
	Thailand	a	a	a	a	a	a	a	m	m
	Tunisia	a	a	a	a	a	n	n	a	a

Note: x indicates that data are included in another column. The column reference is shown in brackets after "x". *e.g.*, x(2) means that data are included in column 2.
1. Gross graduation rate may include some double counting.
2. Year of reference 1999.
3. Year of reference 2001.
Source: OECD.

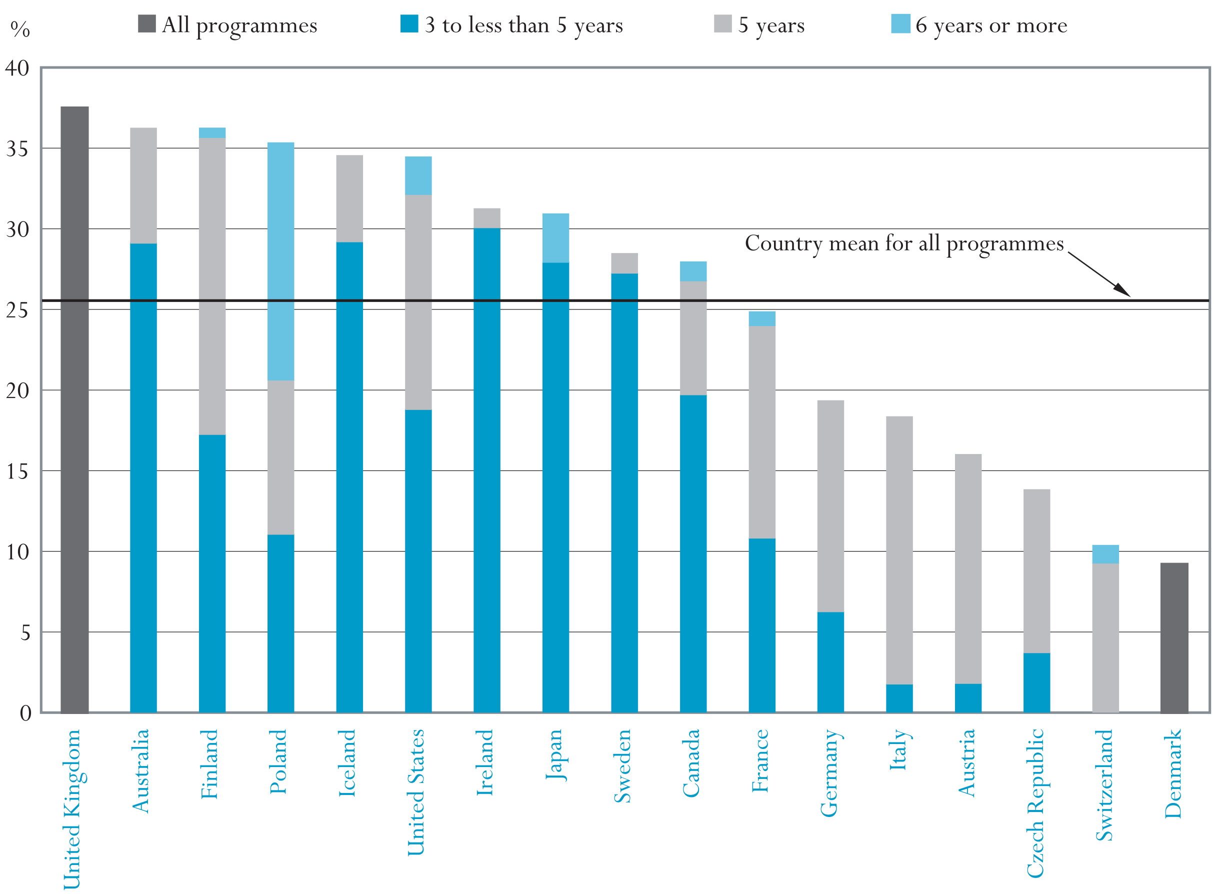
CURRENT TERTIARY GRADUATION AND SURVIVAL RATES AND ATTAINMENT OF THE ADULT POPULATION

- On average across OECD countries, 26 per cent of persons at the typical age of graduation currently complete the tertiary-type A level of education - a figure which ranges from about a third or more in Australia, Finland, Iceland, Poland, the United Kingdom and the United States to below 20 per cent in Austria, the Czech Republic, Denmark, Germany, Italy and Switzerland.
- On average, one-third of OECD students "drop out" before they complete their first degree, regardless of whether they are following tertiary-type A or tertiary-type B programmes.
- As measured by educational attainment, there has been an increase in the stock of university-level skills in the adult population. But most of that increase is due to significant increases in tertiary graduation rates in a comparatively small number of countries.

Chart A2.1.

Graduation rates in tertiary-type A education, by duration of programme (2000)

Ratio of number of graduates to the population at the typical age of graduation (multiplied by 100)



Countries are ranked in descending order of total tertiary-type A graduation rates.
Source: OECD. Table A2.1. See Annex 3 for notes *(www.oecd.org/els/education/eag2002)*.

A2

Policy context

This indicator shows tertiary graduation rates as well as historical patterns of tertiary educational attainment…

Tertiary graduation rates are an indicator of the current production rate of advanced knowledge by each country's education system. Countries with high graduation rates at the tertiary level are the most likely to be developing or maintaining a highly skilled labour force. Measures of educational attainment show the evolution of advanced knowledge in the population.

…and sheds light on the internal efficiency of tertiary education systems.

Tertiary level dropout and survival rates can be useful indicators of the internal efficiency of tertiary education systems but the specific reasons for leaving a tertiary programme are varied: students may realise that they have chosen the wrong subject or educational programme; they may fail to meet the standards set by their educational institution, particularly in tertiary systems that provide broader access; or they may find attractive employment before completing their programme. "Dropping out" is not necessarily an indication of failure by individual students, but high dropout rates may well indicate that the education system is not meeting the needs of its clients. Students may not find that the educational programmes offered meet their expectations or their labour market needs. It may also be that students find that programmes take longer than the number of years which they can justify being outside the labour market.

Evidence and explanations

Graduation rates at the tertiary level

Tertiary programmes vary widely in structure and scope between countries.

Tertiary graduation rates are influenced both by the degree of access to tertiary programmes, as well as by the demand for higher skills in the labour market. They are also affected by the way in which the degree and qualification structures are organised within countries.

This indicator distinguishes between different categories of tertiary qualifications: *i)* degrees at tertiary-type B level (ISCED 5B); *ii)* degrees at tertiary-type A level (ISCED 5A); and *iii)* advanced research qualifications at the doctorate level (ISCED 6).

Tertiary-type A programmes are subdivided in accordance with the theoretical duration of studies to allow for comparisons that are independent of differences in national degree structures.

Tertiary-type A programmes are largely theoretically-based and designed to provide sufficient qualifications for entry to advanced research programmes and professions with high skill requirements. Countries differ in the way in which tertiary-type A studies are organised, both in universities and in other institutions. The duration of programmes leading to a first type-A qualification ranges from three years (*e.g.*, the Bachelor's degree in most colleges in Ireland and the United Kingdom in most fields of study and the *Licence* in France) to five years or more (*e.g.*, the *Diplom* in Germany and the *Laurea* in Italy).

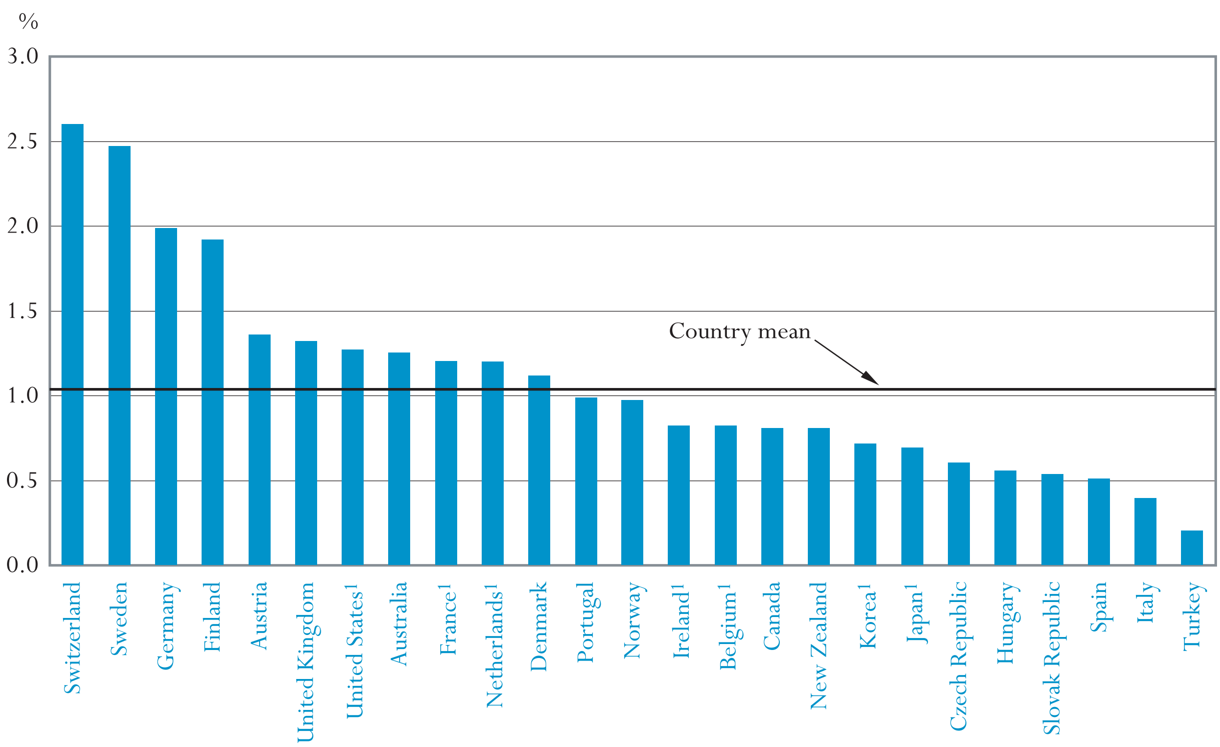
Whereas, in many countries, there is a clear distinction between first and second university degrees, *i.e.,* undergraduate and graduate programmes, this distinction is not made in other countries where degrees that are comparable internationally at the "Master's level" are obtained through a single programme of long duration. To ensure international comparability, it is therefore necessary to compare degree programmes of similar cumulative duration, as well as completion rates for first-degree programmes.

To allow for comparisons that are independent of differences in national degree structures, tertiary-type A degrees are subdivided in accordance with the total theoretical duration of studies at the tertiary level. For the purpose of this indicator, degrees are divided into those of medium (three to less than five years), long (five to less than six years) and very long (more than six years) duration. Degrees obtained from short programmes of less than three years' duration are not considered equivalent to the completion of the tertiary-type A level of education and are therefore not included in this indicator. Second-degree programmes are classified according to the cumulative duration of the first and second-degree programme and individuals who already hold a first degree are netted out of these.

Chart A2.2.

Graduation rates for advanced research programmes (2000)

Sum of graduation rates over single years of age (multiplied by 100)



1. Gross graduation rates were used for these countries, which were calculated as the ratio of the number of graduates to the population at the typical age of graduation, multiplied by 100.

Countries are ranked in descending order of graduation rates for advanced research programmes.

Source: OECD. Table A2.1. See Annex 3 for notes. *(www.oecd.org/els/education/eag2002).*

A2

On average in OECD countries, 26 per cent of persons at the typical age of graduation complete tertiary-type A education…

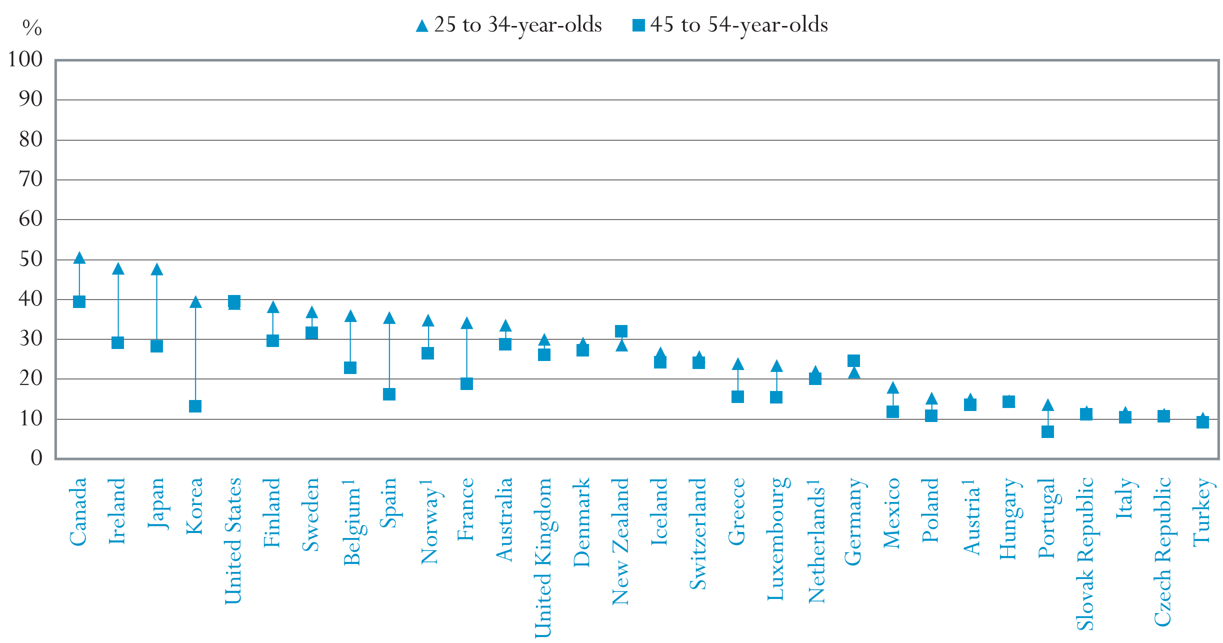
On average in OECD countries, about 26 per cent of persons at the typical age of graduation complete tertiary-type A education. This figure ranges from over a third in Australia, Finland, Iceland, Poland, the United Kingdom and the United States to below 15 per cent in the Czech Republic, Denmark and Switzerland (Chart A2.1). In general, in countries with higher graduation rates the majority of students complete medium length programmes (3 to less than 5 years). Notable exceptions to this rule are Finland and Poland where the majority of students complete longer programmes. The pattern for countries with lower tertiary-type A graduation rates is more obvious. In Austria, the Czech Republic, Germany, Italy and Switzerland, the majority of students complete longer programmes (of at least 5 years duration) and graduation rates are below 20 per cent.

…while the graduation rate at the tertiary-type B level is 11 per cent…

Tertiary-type B programmes are more occupationally-oriented and lead to direct labour market access. The programmes are typically of shorter duration than type A programmes (typically two to three years). Generally they are not deemed to lead to university-level degrees. Graduation rates for tertiary-type B programmes account, on average in OECD countries, for around 11 per cent of an age cohort (Table A2.1). In Denmark and Japan, around 25 per cent of the population at the typical age of graduation complete the tertiary-type B level of education, and this figure is between 11 and 15 per cent in Finland, Germany and Ireland.

Chart A2.3.

Percentage of the population that has attained at least tertiary education, by age group (2001)



1. Year of reference 2000.

Countries are ranked in descending order of the percentage of 25 to 34-year-olds who have attained at least tertiary education.

Source: OECD. Table A2.3. See Annex 3 for a description of ISCED-97 levels, ISCED-97 country mappings and national data sources *(www.oecd.org/els/education/eag2002)*.

On average across OECD countries, 1 per cent of the population obtain an advanced research qualification, such as a Ph.D. In Sweden and Switzerland this is around 2.5 per cent and in Finland and Germany almost 2 per cent (Chart A2.2).

… and 1 per cent obtain an advanced research qualification.

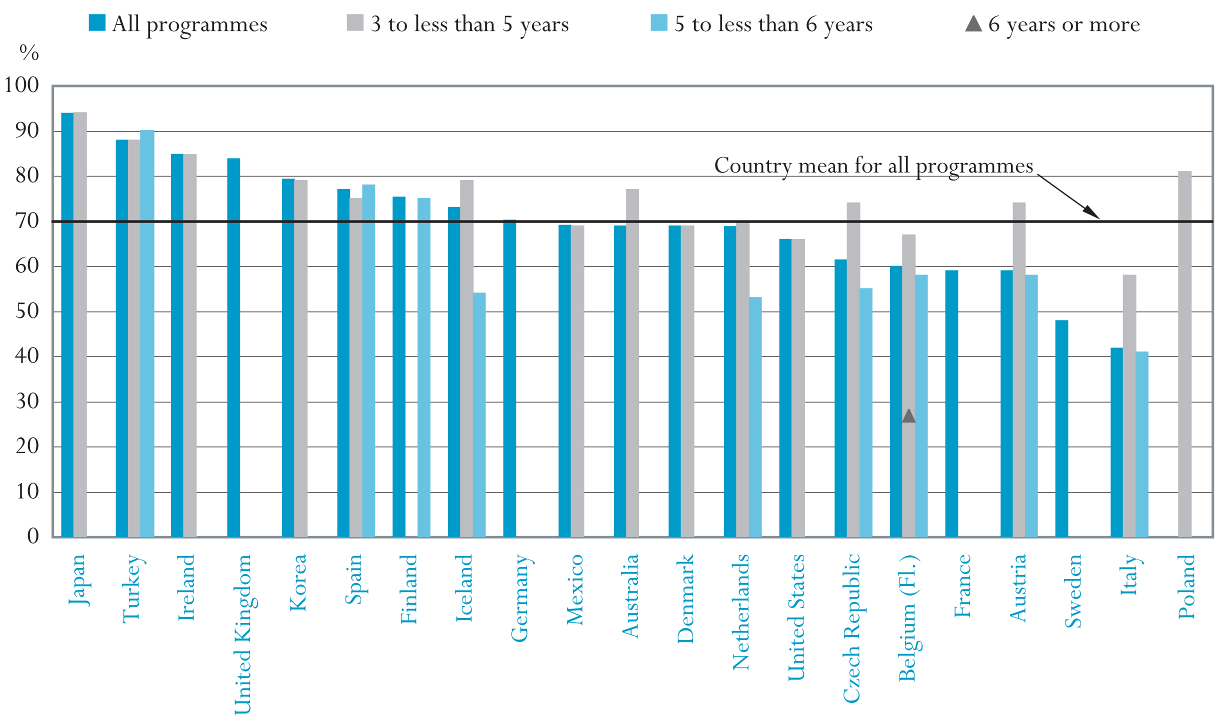
The rising skill requirements of labour markets, an increase in unemployment during recent years and higher expectations by individuals and society have influenced the proportion of young people who obtain at least a tertiary qualification. As measured by tertiary qualifications, there has been a general increase in the stock of higher-level skills in the adult population. Across OECD countries, only 14 per cent of 45 to 54 year-olds hold tertiary-type A and advanced research qualifications, whereas 18 per cent of 25 to 34 year-olds do so (Chart A2.3). In some countries this increase has been marked. In Korea and Spain, for example, only 16 and 13 per cent of 45 to 54-year-olds, respectively, have obtained a tertiary qualification compared to 40 and 36 per cent among 25 to 34-year-olds.

There has been an increase in the proportion of young people who have attained a qualification equivalent to tertiary-type A and advanced research programmes.

Chart A2.4.

Survival rates in tertiary-type A education, by duration of programme (2000)

Number of graduates divided by the number of new entrants in the typical year of entrance to the specified programme



Countries are ranked in descending order of tertiary-type A survival rate for all programmes.
Source: OECD. Table A2.2. See Annex 3 for notes *(www.oecd.org/els/education/eag2002)*.

A2

Survival rates at the tertiary level

Tertiary-type A survival rates are generally higher in countries with more flexible qualification structures…

Tertiary-type A survival rates differ widely between OECD countries, ranging from above 80 per cent in Ireland, Japan, Turkey and the United Kingdom to below 60 per cent in Austria, France, Italy and Sweden (Chart A2.2). In both Austria and Italy the majority of students who do successfully complete a first tertiary-type A programme have followed longer programmes lasting 5 to 6 years. In contrast, the majority of students in Ireland, Japan, Korea, Turkey and the United Kingdom, where survival rates are around 80 per cent or above, have completed a medium first tertiary-type A programme (3 to 5 years long) (see Table A2.2).

…a pattern that is not as clearly visible at the tertiary-type B level.

Tertiary-type B survival rates range from above 80 per cent in Denmark, the Flemish Community of Belgium, Japan, Mexico, Poland and Sweden, to around 50 per cent in Ireland and Italy. In general, tertiary-type B programmes are of a shorter duration than tertiary-type A programmes. In the majority of countries with available data, most, if not all, students successfully complete short programmes (2 to 3 years). It is however interesting to note that both Denmark and the Flemish Community of Belgium have the majority of students graduating from medium length type B programmes (in the Flemish Community the only tertiary-type B programme option) and the highest survival rates at the tertiary-type B level (see Table A2.2).

For advanced research programmes, survival rates are high in Italy, Japan and Korea.

In Italy, Japan and Korea, survival rates for students following advanced research programmes are 85 per cent or higher. Conversely, students are far likelier to drop out of such programmes in France and Iceland (36 and 50 per cent survival rate respectively).

Definitions and methodologies

Data on graduates refer to the academic year 1999-2000 and are based on the UOE data collection on education statistics that is administered annually by the OECD.

Tertiary graduates are those who obtain a tertiary-type A or tertiary-type B qualification in the specified reference year. This indicator distinguishes between different categories of tertiary qualifications: *i)* qualifications at the tertiary-type B level (ISCED 5B); *ii)* tertiary-type A qualifications (ISCED 5A); and *iii)* advanced research degrees of doctorate standard (ISCED 6). For some countries, data are not available for the categories requested. In such cases, the OECD has assigned graduates to the most appropriate category. Tertiary-type A degrees are also subdivided in accordance with the total theoretical duration of studies at the level of ISCED 5A, to allow for comparisons that are independent of differences in national degree structures.

Graduation rates for first tertiary programmes (tertiary-type A and type B) are calculated as gross graduation rates. In order to calculate gross graduation rates, countries identify the age at which graduation typically occurs (see Annex 1). The graduates themselves, however, may be of any age. The number of graduates is then divided by the population at the typical graduation age. In many countries, defining a typical age of graduation is difficult, however, because graduates are dispersed over a wide range of ages.

A net graduation rate is calculated for second and advanced tertiary programmes (where duplication of certificates awarded does not pose a problem) as the sum of age-specific graduation rates. The net graduation rate can be interpreted as the percentage of persons within a virtual age cohort who obtain a tertiary qualification, and are thus unaffected by changes in population size or typical graduation age. Gross graduation rates are presented for those countries that cannot provide such detailed data.

Survival rate at the tertiary level is defined as the proportion of new entrants to the specified level of education who successfully complete a first qualification. Dropouts are defined as those students who leave the specified level in the educational system without obtaining a first qualification. The first qualification refers to any degree, regardless of the duration of study, obtained at the end of a programme which does not have as a prerequisite a previous degree at the same level. The survival rate is calculated as the ratio of the number of students who are awarded an initial degree to the number of new entrants to the level *n* years before, *n* being the number of years of full-time study required to complete the degree.

Educational attainment data are derived from National Labour Force Surveys and use the International Standard Classification of Education (ISCED-97).

Data on population and education attainment are taken from OECD and EUROSTAT databases, which are compiled from National Labour Force Surveys. See Annex 3 at *www.oecd.org/els/education/eag2002* for national sources.

The attainment profiles are based on the percentage of the population aged 25 to 64 years that has completed a specified level of education. The International Standard Classification of Education (ISCED-97) is used to define the levels of education. See Annex 3 at *www.oecd.org/els/education/eag2002* for a description of ISCED-97 education levels and mappings for each country.

A2

Table A2.1.

Tertiary graduation rates (2000)

Ratio of tertiary graduates to the population at the typical age of graduation, multiplied by 100, by programme destination and duration of programme

	Tertiary-type B programmes (first programmes)	Tertiary-type A programmes (first programmes)				Advanced research programmes[1]
		All programmes	3 to less than 5 years (excluding students who subsequently completed a longer programme)	5 years	6 years or more	
	(1)	(2)	(3)	(4)	(5)	(6)
OECD COUNTRIES						
Australia	m	36.3	29.1	7.1	n	1.3
Austria	m	16.0	1.8	14.2	n	1.4
Belgium	m	m	m	m	m	0.8
Canada	m	27.9	19.7	7.1	1.2	0.8
Czech Republic*	4.8	13.6	3.7	10.1	a	0.6
Denmark	24.5	9.2	m	m	m	1.1
Finland*	14.3	36.3	17.2	18.4	0.6	1.9
France	18.3	24.6	10.8	13.2	0.9	1.2
Germany	10.7	19.3	6.2	13.1	a	2.0
Greece	m	m	m	m	m	m
Hungary	m	m	m	m	m	0.6
Iceland*	5.5	33.2	29.2	5.4	n	n
Ireland	15.2	31.2	30.0	1.2	x(4)	0.8
Italy	0.6	18.1	1.8	16.6	n	0.4
Japan	28.8	30.9	27.2	x(3)	3.3	0.7
Korea	m	m	m	m	m	0.7
Luxembourg	m	m	m	m	m	m
Mexico	m	m	m	m	m	m
Netherlands	m	m	m	m	m	1.2
New Zealand	m	m	m	m	m	0.8
Norway	m	m	m	m	m	1.0
Poland	m	34.4	11.0	9.6	14.7	m
Portugal	m	m	m	m	m	1.0
Slovak Republic	2.2	m	m	m	m	0.5
Spain	7.8	m	m	m	m	0.5
Sweden	4.2	28.1	27.2	1.2	a	2.5
Switzerland	m	10.4	n	9.3	1.1	2.6
Turkey	m	m	m	m	m	0.2
United Kingdom	m	37.5	m	m	m	1.3
United States	8.3	33.2	18.8	13.3	2.3	1.3
Country mean	*11.2*	*25.9*	*15.6*	*10.0*	*1.7*	*1.0*

Note: x indicates that data are included in another column. The column reference is shown in brackets after "x". *e.g.,* x(2) means that data are included in column 2.

1. Net graduation rate is calculated by summing the graduation rates by single year of age, except for Belgium, France, Ireland, Japan, Korea, the Netherlands and the United States.

*See Annex 3 for notes (*www.oecd.org/els/education/eag2002*).

Source: OECD.

A2

Table A2.2.
Survival rates in tertiary education (2000)
Number of graduates divided by the number of new entrants in the typical year of entrance, by programme destination, and distribution of graduates by duration of programme

		Tertiary-type A education				Tertiary-type B education				
		Survival rate for all tertiary-type A programmes	Survival rate for programmes of duration: 3 to less than 5 years	5 to less than 6 years	6 years or more	Survival rate for all tertiary-type B programmes	Survival rate for programmes of duration: 2 to less than 3 years	3 to less than 5 years	5 years or more	Advanced research programmes
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
OECD COUNTRIES	Australia*	69	77	m	n	m	m	a	a	m
	Austria	59	74	58	n	m	m	m	m	m
	Belgium (Fl.)*	60	67	58	27	88	a	88	a	m
	Czech Republic	61	74	55	a	77	75	78	a	m
	Denmark	69	69	a	a	84	65	90	a	m
	Finland	75	m	75	a	m	m	m	m	m
	France*	59	m	m	m	72	72	n	a	36
	Germany	70	a	a	a	75	a	a	a	m
	Iceland	73	79	54	n	55	73	31	n	50
	Ireland	85	85	x(2)	x(2)	50	50	x(6)	a	m
	Italy	42	58	41	a	51	a	51	a	89
	Japan	94	94	x(2)	x(2)	86	86	x(6)	x(6)	85
	Korea	79	79	x(2)	a	74	73	78	a	95
	Mexico	69	69	x(2)	a	81	81	x(6)	a	54
	Netherlands	69	70	53	a	58	59	50	a	m
	Poland	m	81	m	a	84	84	a	a	m
	Spain	77	75	78	n	74	74	n	n	m
	Sweden	48	m	m	a	85	m	m	a	m
	Turkey	88	88	90	a	77	77	a	a	a
	United Kingdom*	83	m	m	m	m	m	m	m	m
	United States*	66	66	a	a	62	62	x(6)	x(6)	m
	Country mean	*70*	*76*	*62*	*2*	*73*	*72*	*67*	*n*	*58*
NON-OECD COUNTRY	Israel	70	m	m	m	91	m	m	m	m

Note: x indicates that data are included in another column. The column reference is shown in brackets after "x". *e.g.,* x(2) means that data are included in column 2.
*See Annex 3 for notes (*www.oecd.org/els/education/eag2002*).
Source: OECD.

A2

Table A2.3.

Population that has attained tertiary education (2001)

Percentage of the population that has attained tertiary-type B education and tertiary-type A or advanced research programmes, by age group

	Tertiary-type B education					Tertiary-type A and advanced research programmes				
	25-64	25-34	35-44	45-54	55-64	25-64	25-34	35-44	45-54	55-64
OECD COUNTRIES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Australia	10	10	10	10	9	19	24	19	19	12
Austria[1]	7	8	8	7	5	7	7	8	6	4
Belgium[1]	15	19	16	13	9	12	17	13	10	8
Canada	21	25	23	20	15	20	25	20	20	15
Czech Republic	x(6)	x(7)	x(8)	x(9)	x(10)	11	11	13	11	9
Denmark	19	18	20	21	16	8	11	8	6	4
Finland	17	20	21	16	12	15	18	16	13	11
France	11	17	12	9	6	12	18	11	10	8
Germany	10	8	11	10	10	13	14	15	15	10
Greece	5	7	7	4	3	12	17	14	12	6
Hungary	x(6)	x(7)	x(8)	x(9)	x(10)	14	15	15	14	12
Iceland	6	6	8	6	4	19	21	21	19	11
Ireland	22	28	23	18	13	14	20	14	11	8
Italy	x(6)	x(7)	x(8)	x(9)	x(10)	10	12	11	10	6
Japan	15	23	19	11	5	19	24	25	17	10
Korea	7	15	6	2	1	17	25	20	11	8
Luxembourg	7	8	6	6	5	11	15	11	10	8
Mexico	2	3	2	1	0	13	15	15	11	7
Netherlands[1]	3	2	3	3	2	21	24	22	20	15
New Zealand	15	12	16	18	17	14	17	15	14	7
Norway[1]	3	3	3	3	2	26	32	26	23	19
Poland	x(6)	x(7)	x(8)	x(9)	x(10)	12	15	11	11	10
Portugal	2	3	3	2	2	7	11	7	5	3
Slovak Republic	1	1	1	1	0	10	11	11	10	8
Spain	7	12	7	3	2	17	24	18	13	8
Sweden	15	17	17	14	10	17	20	16	17	15
Switzerland	10	10	11	9	8	16	16	18	15	13
Turkey	x(6)	x(7)	x(8)	x(9)	x(10)	9	10	8	9	6
United Kingdom	8	9	9	8	7	18	21	18	18	12
United States	9	9	10	10	7	28	30	28	30	24
Country mean	*8*	*10*	*9*	*7*	*6*	*15*	*18*	*16*	*14*	*10*

Note: x indicates that data are included in another column. The column reference is shown in brackets after "x". *e.g.*, x(2) means that data are included in column 2.
1. Year of reference 2000.
Source: OECD. See Annex 3 for a description of ISCED-97 levels, ISCED-97 country mappings and national data sources (*www.oecd.org/els/education/eag2002*).

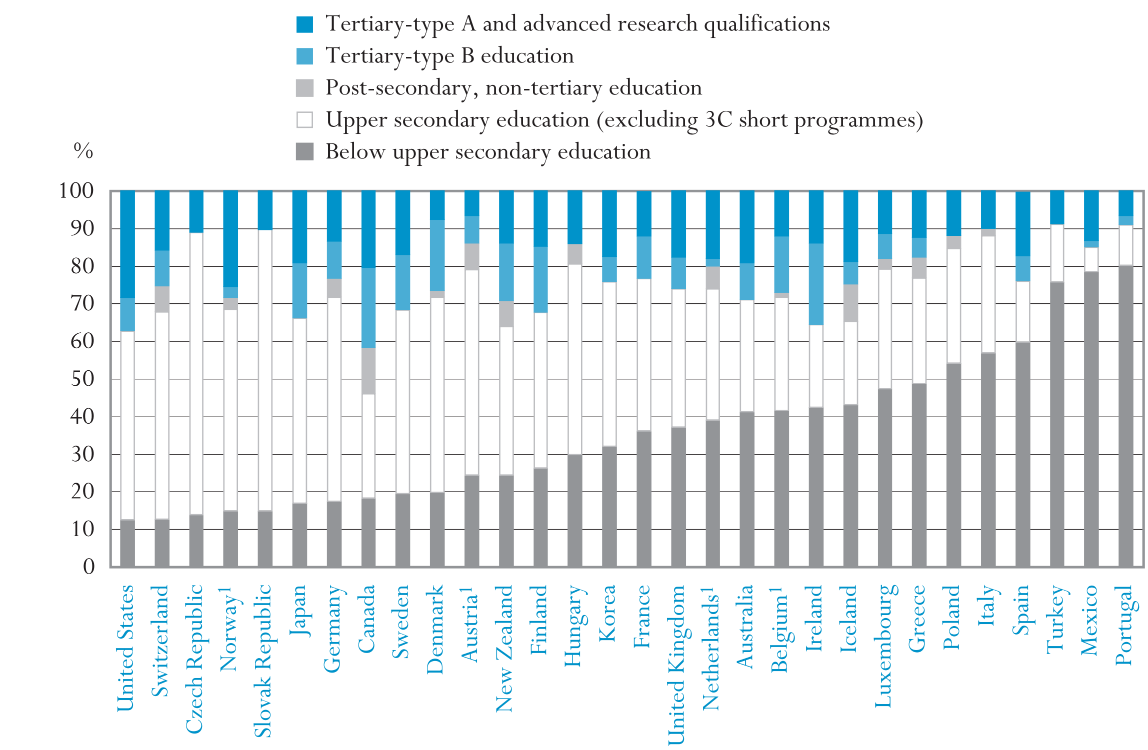
EDUCATIONAL ATTAINMENT OF THE LABOUR FORCE AND ADULT POPULATION

- Educational attainment is generally higher among people in the labour force than among adults of working age outside it.
- In Mexico, Portugal and Turkey more than two-thirds of the labour force aged 25 to 64 have not completed the upper secondary level of education and around half in Italy and Spain. The proportion of the labour force aged 25 to 64 who have completed upper secondary education is at least 85 per cent in Canada, the Czech Republic, Germany, Japan, Norway, Poland, the Slovak Republic, Switzerland, the United Kingdom and the United States.

Chart A3.1.

Educational attainment of the adult population (2001)

Distribution of 25 to 64-year-olds, by level of educational attainment



Note: Not all ISCED 3 programmes meet minimum requirements for ISCED 3C long programmes. See Annex 3 for notes *(www.oecd.org/els/education/eag2002)*.
1. Year of reference 2000.
Countries are ranked in ascending order of the percentage of 25 to 64-year-olds who have completed below upper secondary education.
Source: OECD. Table A3.1a. See Annex 3 for a description of ISCED-97 levels, ISCED-97 country mappings and national data sources *(www.oecd.org/els/education/eag2002)*.

Policy context

This indicator shows a profile of the educational attainment of the labour force and the adult population as a proxy for the knowledge and skills available to economies and societies.

A well-educated and well-trained labour force is important for the social and economic well-being of countries and individuals. Education plays a key role in providing individuals with the knowledge, skills and competencies to participate effectively in society and the economy. Education also contributes to an expansion of scientific and cultural knowledge. This indicator shows the distribution of levels of educational attainment in the labour force and adult population.

Evidence and explanations

Countries differ widely in the distribution of educational attainment in their labour force.

In 20 out of the 30 OECD countries, 60 per cent or more of the labour force aged 25 to 64 has completed at least the upper secondary level of education (Table A3.1b). This refers to those who have completed educational programmes at ISCED-97 levels 3A or 3B, or long programmes at ISCED-97 level 3C. The proportion is equal to or exceeds 80 per cent in 13 OECD countries: Austria, Canada, the Czech Republic, Denmark, Germany, Japan, Hungary, New Zealand, Norway, the Slovak Republic, Switzerland, Sweden and the United States. In other countries, especially but not only in southern Europe, the educational structure of the adult population shows a different profile: in Italy, Mexico, Portugal, Spain and Turkey, more than half of the labour force aged 25 to 64 years have not completed upper secondary education.

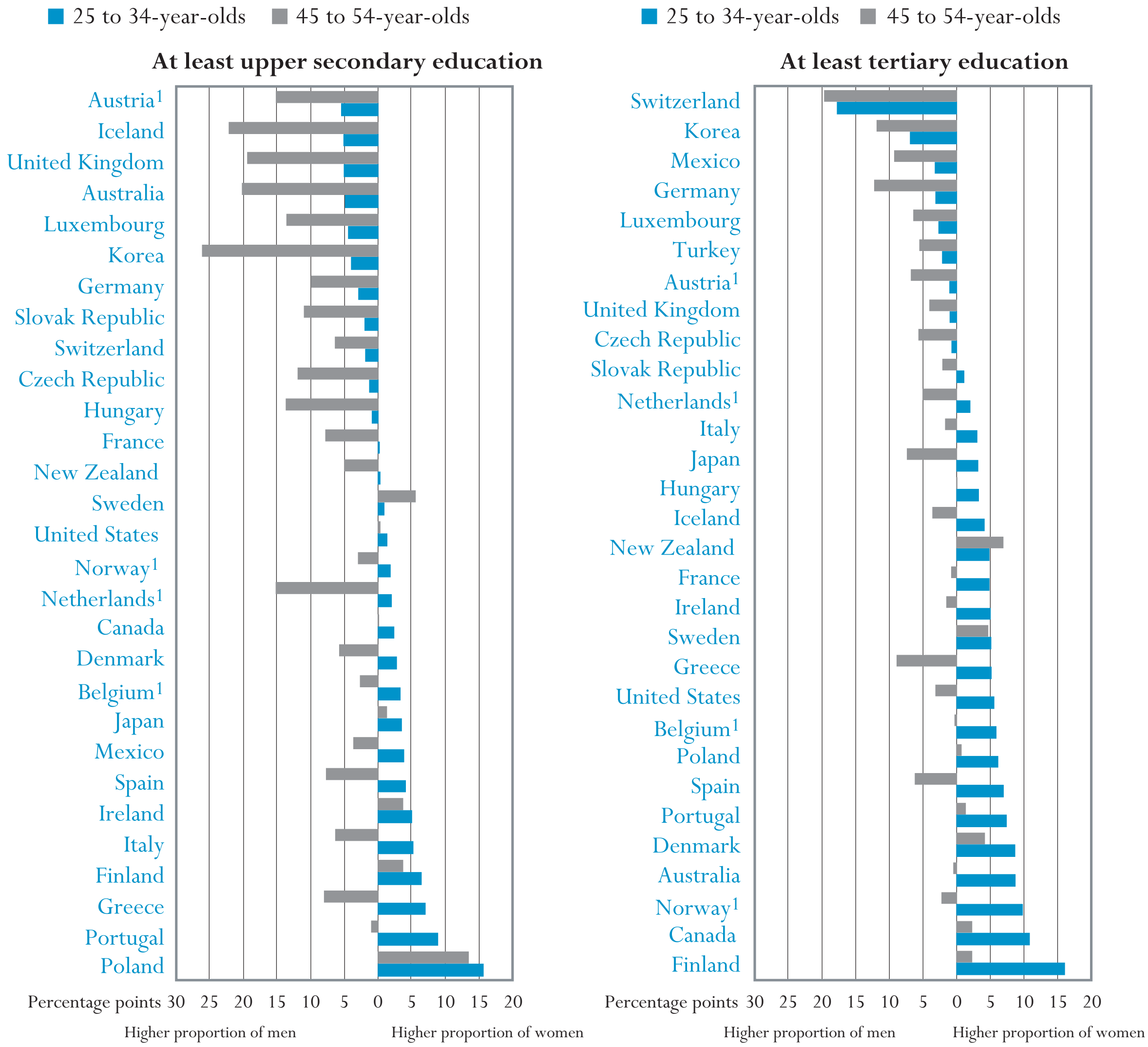
Educational attainment is generally higher among people in the labour force than among working age adults outside it.

A comparison between the distribution of educational attainment in the labour force aged 25 to 64, and the distribution of educational attainment in the total population in the same age range shows a higher percentage of people in the labour force with upper secondary and tertiary qualifications (see Table A3.1b). Across OECD countries, an average of 66 per cent of the adult population have completed at least upper secondary education, but in the adult labour force this figure is 71 per cent. In Belgium, Hungary and Italy, upper secondary and tertiary attainment in the adult population and in the labour force differ by 9 percentage points or more whereas the difference is less than 2 percentage points in Iceland, Japan, Korea and Switzerland.

Chart A3.2.

Gender differences in educational attainment, by age group (2001)

Difference between female and male 25 to 34 and 45 to 54-year-olds in the percentage of the population that has attained at least upper secondary or at least tertiary education



Note: Not all ISCED 3 programmes meet minimum requirements for ISCED 3C long programmes. See Annex 3 for notes *(www.oecd.org/els/education/eag2002).*

1. Year of reference 2000.

Countries are ranked in ascending order of the difference between women and men as a percentage of 25 to 34-year-olds who have attained at least upper secondary or tertiary education.

Source: OECD. Table A3.1c. See Annex 3 for a description of ISCED-97 levels, ISCED-97 country mappings and national data sources *(www.oecd.org/els/education/eag2002).*

Definitions and methodologies

Data derive from National Labour Force Surveys and use the International Standard Classification of Education (ISCED-97).

The attainment profiles shown here are based on the percentage of the population or of the labour force aged 25 to 64 years that has completed a specified level of education. The International Standard Classification of Education (ISCED-97) is used to define the levels of education. The post-secondary non-tertiary level (ISCED 4) covers programmes that straddle the boundary between upper secondary and tertiary education.

Tertiary education comprises two levels (ISCED 5 and ISCED 6). ISCED 5 consists of programmes that do not lead directly to an advanced research qualification, while ISCED 6 is reserved for programmes leading to advanced research qualifications, such as a Ph.D. Tertiary education (ISCED 5) is further sub-divided into two categories, ISCED 5A and 5B. ISCED 5A, tertiary-type A education, covers more theoretical programmes that give access to advanced research programmes and to professions with high general skills requirements, while ISCED 5B, tertiary-type B education, covers more practical or occupationally specific programmes that provide participants with a qualification of immediate relevance to the labour market.

Data on population and educational attainment are taken from OECD and EUROSTAT databases, which are compiled from National Labour Force Surveys. See Annex 3 at *www.oecd.org/els/education/eag2002* for national sources.

Table A3.1a.

Educational attainment of the population (2001)

Distribution of the **population** *of 25 to 64-year-olds, by highest level of education attained*

OECD COUNTRIES	Pre-primary and primary education	Lower secondary education	Upper secondary education: ISCED 3C Short	Upper secondary education: ISCED 3C Long / 3B	Upper secondary education: ISCED 3A	Post-secondary non-tertiary education	Tertiary-type B education	Tertiary-type A and advanced research programmes	All levels of education
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Australia	x(2)	41	a	11	19	x(5)	10	19	100
Austria[1]	x(2)	24	a	48	7	7	7	7	100
Belgium[1]	20	22	a	7	23	1	15	12	100
Canada	6	12	a	x(5)	28	12	21	20	100
Czech Republic	x(2)	14	x(4)	42	33	x(5)	x(8)	11	100
Denmark	n	20	x(2)	46	6	2	19	8	100
Finland	x(2)	26	a	a	42	x(5)	17	15	100
France	18	18	28	3	10	n	11	12	100
Germany	2	16	a	52	3	5	10	13	100
Greece	39	10	a	4	24	5	5	12	100
Hungary	3	27	a	28	23	5	n	14	100
Iceland	2	34	7	a	22	10	6	19	100
Ireland	25	18	a	a	22	x(5,7)	22	14	100
Italy	22	33	2	6	25	2	x(8)	10	100
Japan	x(2)	17	a	x(5)	49	x(9)	15	19	100
Korea	17	15	a	x(5)	44	a	7	17	100
Luxembourg	28	20	x(2)	18	14	3	7	11	100
Mexico	55	23	a	7	a	a	2	13	100
Netherlands[1]	13	22	x(4)	24	13	4	3	21	100
New Zealand	x(2)	24	a	21	19	7	15	14	100
Norway[1]	1	14	a	42	12	3	3	26	100
Poland	x(2)	19	35	a	31	3	x(8)	12	100
Portugal	68	12	x(5)	x(5)	11	x(5)	2	7	100
Slovak Republic	1	14	a	39	35	a	1	10	100
Spain	35	25	x(5)	6	11	x(7)	7	17	100
Sweden	9	10	a	x(5)	49	x(7)	15	17	100
Switzerland	3	9	a	49	6	7	10	16	100
Turkey	66	9	a	6	10	a	x(8)	9	100
United Kingdom	x(2)	17	27	15	15	x(9)	8	18	100
United States	5	8	x(5)	x(5)	50	x(5)	9	28	100
Country mean	*15*	*19*	*3*	*16*	*22*	*3*	*8*	*15*	*100*

Note: x indicates that data are included in another column. The column reference is shown in brackets after "x". *e.g.*, x(2) means that data are included in column 2.
1. Year of reference 2000.
Source: OECD. See Annex 3 for a description of ISCED-97 levels, ISCED-97 country mappings and national data sources (*www.oecd.org/els/education/eag2002*).

A3

Table A3.1b.
Educational attainment of the labour force (2001)
Distribution of the ***labour force*** *for 25 to 64-year-olds, by highest level of education attained*

	Pre-primary and primary education	Lower secondary education	Upper secondary education			Post-secondary non-tertiary education	Tertiary-type B education	Tertiary-type A and advanced research programmes	All levels of education
			ISCED 3C Short	ISCED 3C Long/3B	ISCED 3A				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
OECD COUNTRIES									
Australia	x(2)	35	a	12	20	x(5)	11	22	100
Austria[1]	x(2)	19	a	50	6	8	8	8	100
Belgium[1]	12	21	a	8	26	1	18	15	100
Canada	4	10	a	x(5)	28	13	23	22	100
Czech Republic	x(2)	10	x(4)	43	35	x(5)	x(8)	13	100
Denmark	n	16	x(2)	48	5	2	21	9	100
Finland	x(2)	21	a	a	43	x(5)	19	17	100
France	13	18	29	3	11	n	13	13	100
Germany	1	12	a	52	2	5	11	16	100
Greece	32	10	a	5	24	7	6	16	100
Hungary	1	18	a	32	25	6	n	18	100
Iceland	2	33	7	a	22	10	6	20	100
Ireland	18	17	a	a	23	x(5,7)	25	17	100
Italy	12	33	2	7	30	2	x(8)	13	100
Japan	x(2)	15	a	x(5)	49	x(9)	14	22	100
Korea	15	15	a	x(5)	43	a	7	19	100
Luxembourg	23	18	x(2)	19	15	3	8	14	100
Mexico	50	25	a	6	n	a	2	17	100
Netherlands[1]	8	20	x(4)	25	15	5	3	24	100
New Zealand	x(2)	20	a	22	19	7	16	15	100
Norway[1]	n	12	n	42	12	3	3	28	100
Poland	x(2)	14	36	a	32	4	x(8)	14	100
Portugal	64	13	x(5)	x(5)	12	x(5)	3	8	100
Slovak Republic	n	9	a	41	37	a	1	12	100
Spain	26	26	x(5)	7	11	x(7)	8	21	100
Sweden	7	10	a	x(5)	50	x(7)	15	18	100
Switzerland	3	8	a	48	6	7	11	17	100
Turkey	59	10	a	7	11	a	x(8)	12	100
United Kingdom	x(2)	12	27	16	16	x(9)	9	20	100
United States	3	6	x(5)	x(5)	50	x(5)	10	31	100
Country mean	*12*	*17*	*3*	*16*	*23*	*3*	*9*	*17*	*100*

Note: x indicates that data are included in another column. The column reference is shown in brackets after "x". *e.g.,* x(2) means that data are included in column 2.
1. Year of reference 2000.
Source: OECD. See Annex 3 for a description of ISCED-97 levels, ISCED-97 country mappings and national data sources (*www.oecd.org/els/education/eag2002*).

Table A3.1c.

Educational attainment of the population, by gender (2001)

Percentage of the population that has attained at least upper secondary education or at least tertiary education, by age group and gender

OECD COUNTRIES

		At least upper secondary education[1]					At least tertiary education (tertiary-type A education, tertiary-type B education and advanced research programmes)				
		25-64	25-34	35-44	45-54	55-64	25-64	25-34	35-44	45-54	55-64
Australia	Males	66	73	67	65	54	27	29	27	29	22
	Females	52	68	54	45	34	31	38	32	29	21
Austria[2]	Males	82	86	85	79	73	17	16	19	17	15
	Females	69	81	75	64	52	11	14	14	10	5
Belgium[2]	Males	59	74	61	53	42	27	33	28	23	20
	Females	58	77	65	50	35	28	39	31	23	14
Canada	Males	81	88	83	81	68	39	45	39	38	30
	Females	82	91	86	81	65	44	56	46	40	30
Czech Republic	Males	91	93	93	90	86	13	12	14	14	12
	Females	82	92	87	78	68	9	11	12	8	7
Denmark	Males	82	85	82	83	75	24	25	24	25	21
	Females	79	88	79	78	69	29	34	32	29	19
Finland	Males	72	84	81	68	51	29	30	32	28	25
	Females	76	90	87	72	51	36	46	42	31	22
France[3]	Males	67	78	69	62	52	22	32	21	19	16
	Females	61	78	66	55	40	24	37	24	18	13
Germany	Males	87	87	88	88	85	28	23	30	31	28
	Females	78	84	83	78	67	18	20	21	18	12
Greece	Males	54	69	62	47	33	20	21	24	20	13
	Females	49	76	58	40	23	16	27	19	11	6
Hungary	Males	75	81	82	79	49	14	13	13	14	14
	Females	66	80	75	65	40	15	16	18	14	10
Iceland	Males	64	64	67	66	58	24	25	27	26	16
	Females	49	59	54	44	33	25	29	31	22	15
Ireland	Males	55	71	59	46	35	35	45	37	30	22
	Females	60	76	66	50	36	36	50	36	28	20
Italy	Males	44	55	48	42	26	10	10	11	11	8
	Females	43	60	51	35	18	10	13	11	10	5
Japan	Males	83	92	93	80	65	36	46	46	32	20
	Females	83	95	95	82	61	32	49	41	25	11
Korea	Males	76	95	84	61	45	30	42	34	19	15
	Females	59	91	68	35	16	18	35	17	7	3
Luxembourg	Males	58	62	61	54	53	21	25	20	19	20
	Females	47	57	53	40	31	15	22	15	12	8
Mexico	Males	22	23	25	19	12	18	20	22	17	10
	Females	22	27	24	16	10	12	16	13	7	4
Netherlands[2,3]	Males	63	73	71	67	62	26	27	27	27	22
	Females	61	75	67	53	41	21	26	22	18	13
New Zealand	Males	77	82	80	78	65	26	26	27	29	23
	Females	74	82	79	73	55	32	31	34	35	26
Norway[2]	Males	86	93	90	83	73	28	30	28	28	23
	Females	84	94	91	80	66	29	40	30	25	18
Poland	Males	39	44	39	38	34	11	12	9	10	11
	Females	52	60	56	51	38	13	18	13	11	10
Portugal	Males	19	28	19	14	10	7	10	7	6	5
	Females	21	37	21	13	7	11	17	11	7	4
Slovak Republic	Males	90	95	92	89	79	11	11	11	12	10
	Females	81	93	88	78	56	11	12	12	10	7
Spain	Males	42	55	46	34	22	24	32	25	19	14
	Females	40	59	46	26	14	23	39	25	13	7
Sweden	Males	79	90	84	76	63	30	34	31	29	24
	Females	82	91	88	81	67	34	39	35	34	25
Switzerland	Males	90	93	92	88	87	35	35	37	34	33
	Females	85	91	88	82	75	16	17	21	15	8
Turkey	Males	28	35	28	23	15	10	11	9	11	8
	Females	19	25	18	13	10	7	9	7	6	4
United Kingdom[3]	Males	69	70	70	71	63	27	30	28	28	20
	Females	57	65	59	52	42	25	29	26	24	17
United States	Males	87	87	88	89	83	37	36	37	41	35
	Females	88	89	89	89	82	37	42	38	38	27
Country mean	***Males***	***66***	***73***	***70***	***64***	***54***	***24***	***26***	***25***	***23***	***18***
	Females	***62***	***74***	***67***	***57***	***43***	***22***	***29***	***24***	***19***	***13***

1. Excluding ISCED 3C short programmes.
2. Year of reference 2000.
3. Not all ISCED 3 programmes meet minimum requirements for ISCED 3C long programmes. See Annex 3 for notes (*www.oecd.org/els/education/eag2002*).
Source: OECD. See Annex 3 for a description of ISCED-97 levels, ISCED-97 country mappings and national data sources (*www.oecd.org/els/education/eag2002*).

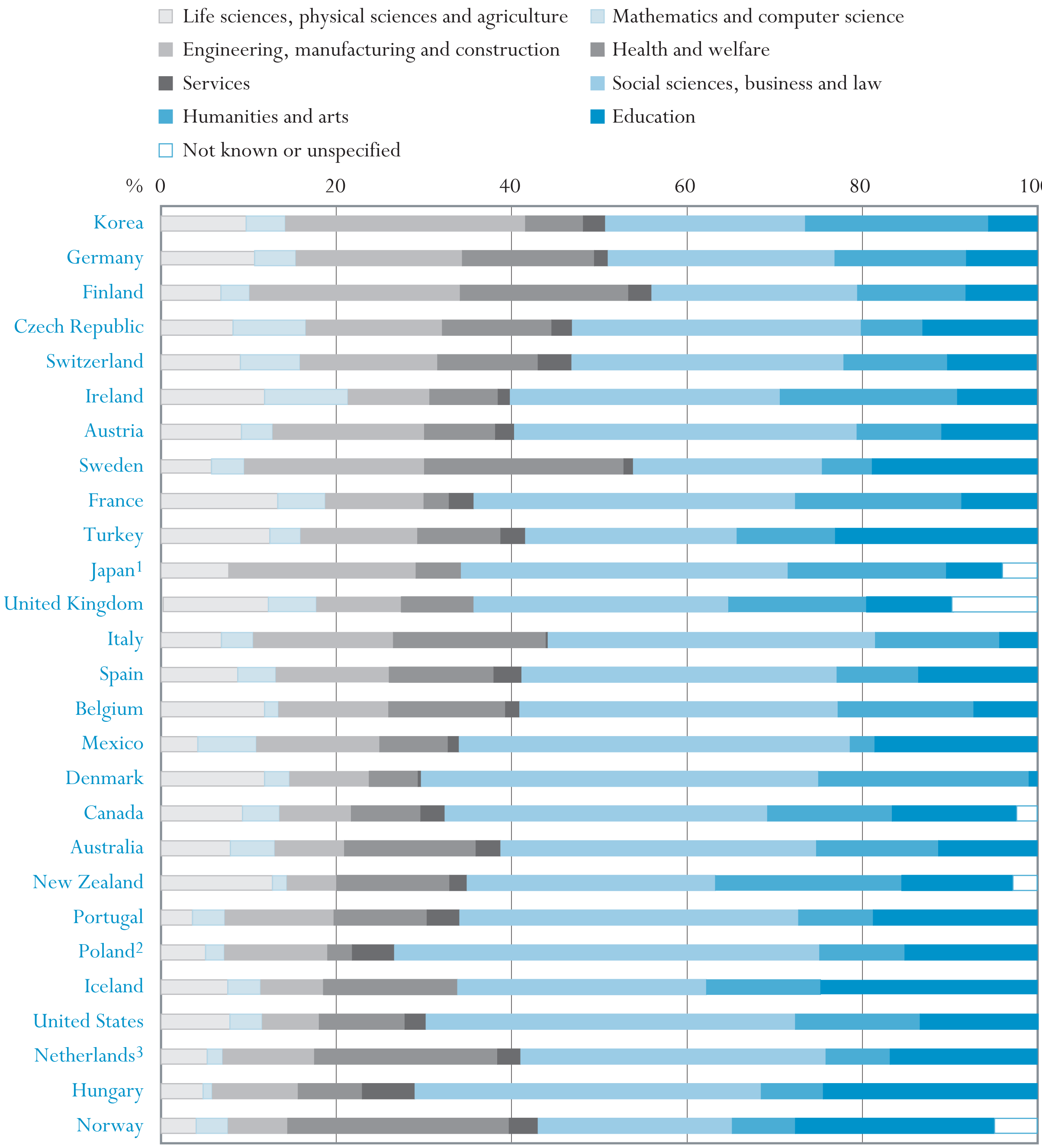
GRADUATES BY FIELD OF STUDY

- On average across OECD countries, every third tertiary-type A graduate obtains a degree in the social sciences, business or law. The second most popular fields are the humanities, arts and education.
- In the humanities, arts, education, health and welfare, on average in OECD countries, more than two-thirds of the tertiary-type A graduates are women, whereas there are less than one-third in mathematics and computer science and less than one-quarter in engineering, manufacturing and construction.
- In OECD countries, men are still more likely than women to earn advanced research qualifications, such as doctorates.
- Social sciences, business and law, and education are also popular at the tertiary-type B level.

Chart A4.1.

Tertiary graduates by field of study (2000)

Graduates with tertiary-type A and advanced research qualifications, by field of study



Countries are ranked in descending order of the proportion of qualifications in life sciences, physical sciences and agriculture, mathematics and computer science, and engineering, manufacturing and construction.
1. Mathematics and computer science are included in the category "life sciences, physical sciences and agriculture".
2. Excludes tertiary-type A second degree programmes and advanced research programmes.
3. Excludes advanced research programmes.
Source: OECD. Table A4.1. See Annex 3 for notes *(www.oecd.org/els/education/eag2002).*

Policy context

This indicator shows the distribution of tertiary graduates across fields of study.

Changing opportunities in the job market, relative earnings in different occupations and sectors, and admission policies and practices among tertiary education institutions may affect the fields which students choose to study. In turn, the relative popularity of the various fields of study affects the demand for courses and teaching staff, as well as the supply of new graduates. This indicator sheds light on the distribution of tertiary graduates across fields of study as well as the relative share of women among graduates in the different fields of study.

Evidence and explanations

Graduates by field of study

On average in OECD countries, every third tertiary-type A graduate obtains a degree in the social sciences, law or business.

In 24 of the 28 countries providing data, the largest concentration of tertiary-type A and advanced research qualifications awarded is in the combined fields of social sciences, business and law (Table A4.1). On average in OECD countries, every third tertiary-type A graduate obtains a degree in the social sciences, business or law. The percentage of tertiary-type A qualifications awarded in the social sciences, business and law ranges from under 25 per cent in Finland, Korea, Norway, Sweden and Turkey, to over 40 per cent in Denmark, Mexico, Poland and the United States. In Finland and Korea the largest concentration of tertiary-type A and advanced research qualifications awarded is in the fields of engineering, manufacturing and construction, and in Norway and Sweden in the fields of health and welfare.

The second most popular fields are humanities, arts and education.

Typically, one out of every three or four students graduates from the fields of humanities, arts or education. The percentage of students in science-related fields (engineering, manufacturing and construction, life sciences, physical sciences and agriculture, mathematics and computing, but not including health and welfare) ranges from less than 19 per cent in Hungary, Iceland, the Netherlands, Norway and the United States, to 34 per cent in Finland and Germany, and 42 per cent in Korea.

Individual preferences, admission policies and degree structures influence the prevalence of the different fields of study.

The distribution of qualifications awarded by field of study is driven by the relative popularity of these fields among students, the relative number of students admitted to these fields in universities and equivalent institutions, and the degree structure of the various disciplines in a particular country.

Part of the variation in graduation rates between countries (Table A2.1) can also be accounted for by differences in the number of tertiary-type A degrees earned in the fields of education and the humanities. Countries with high graduation rates, on average, have a higher proportion of graduates in education and humanities and a lower proportion of graduates in science-related fields. In other words, there is less variation in graduation rates in science-related fields between countries than in overall graduation rates.

Social sciences, business and law, and education are also popular at the tertiary-type B level.

The picture is much the same for tertiary-type B education, where programmes are more occupationally oriented: the combined field of the social sciences, business and law has the largest concentration of graduates (26 per cent), followed by the combined field of the humanities, arts and education (21 per cent).

However, health and welfare graduates are more common at this level than engineering, manufacturing and construction graduates (19 and 15 per cent respectively) (see Table A4.1).

The selection of a field of study at this level is heavily dependent on opportunities to study similar subject matter, or to prepare for similar occupations at the post-secondary non-tertiary or tertiary-type A level. For example, if nurses in a particular country were trained primarily in tertiary-type B programmes, the proportion of students graduating with qualifications in medical sciences from that level would be higher than if nurses were primarily trained in upper secondary or tertiary-type A programmes.

Gender differences in tertiary graduation

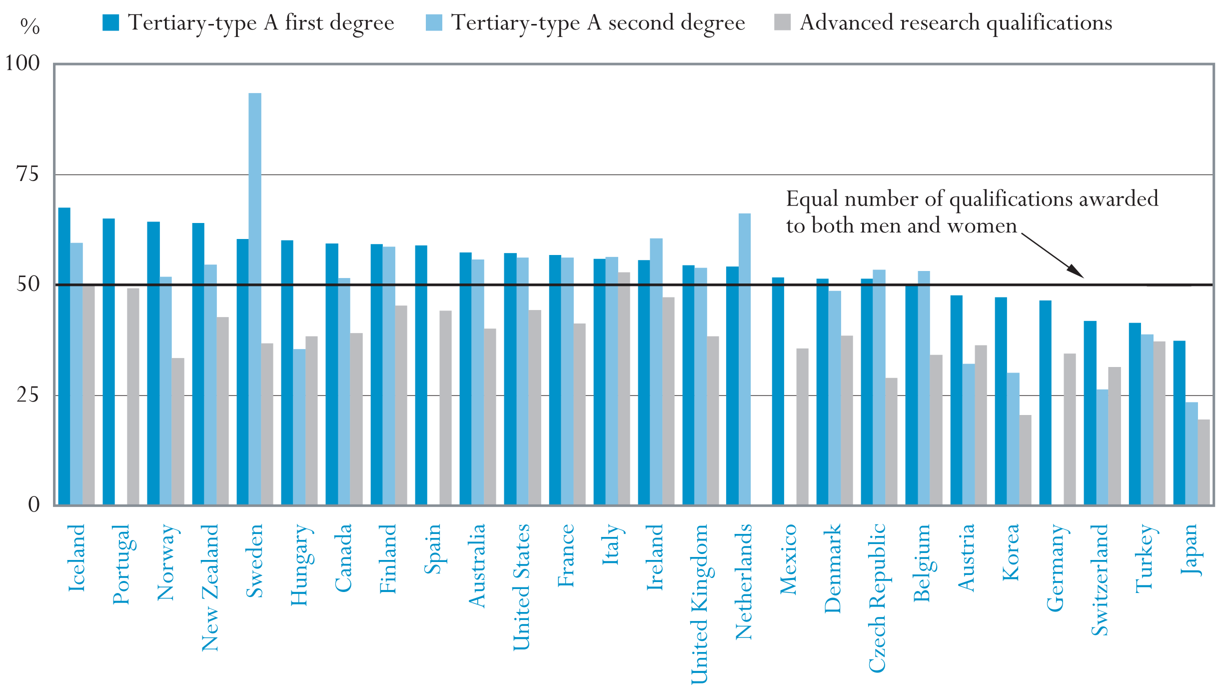
Tertiary-type A graduation rates for women equal or exceed those for men in most countries...

First tertiary-type A graduation rates for women equal or exceed those for men in 21 out of 27 OECD countries. On average in OECD countries, 54 per cent of all first tertiary-type A graduates are women. However, major differences remain between fields of study. In the humanities, arts, education, health and welfare, more than two thirds of the tertiary-type A graduates are women, on average in OECD countries, whereas less than one third of mathematics and computer science graduates and less than a fifth of engineering, manufacturing and construction graduates are women.

Chart A4.2.

Proportion of tertiary qualifications awarded to women (2000)

For all fields of study for women with tertiary-type A and advanced research qualifications



Countries are ranked in descending order of the percentage of tertiary-type A first degrees that are awarded to women.
Source: OECD. Table A4.2. See Annex 3 for notes *(www.oecd.org/els/education/eag2002).*

…except in Austria, Germany, Japan, Korea, Switzerland and Turkey.

In Iceland, New Zealand, Norway and Portugal, the proportion of women obtaining a first tertiary-type A qualification exceeds 60 per cent but it is 48 per cent or below in Austria, Germany, Japan, Korea, Switzerland and Turkey (Tables A4.2 and A3.1c).

In OECD countries, men are still more likely than women to earn advanced research qualifications, such as doctorates.

Men remain more likely than women to obtain advanced research qualifications in OECD countries (Table A4.2). Graduation rates from advanced research, *e.g.,* Ph.D. programmes, are lower for women than for men in all countries, except Italy. On average in OECD countries, nearly two-thirds of all graduates at this level are men. In Japan and Korea, around 80 per cent of advanced research qualifications are awarded to men.

Definitions and methodologies

Data on graduates refer to the academic year 1999-2000 and are based on the UOE data collection on education statistics that is annually administered by the OECD.

Tertiary graduates are those who obtain a tertiary-type A or tertiary-type B qualification or equivalent in the specified reference year. This indicator distinguishes between different categories of tertiary qualifications: *i)* qualifications at the tertiary-type B level (ISCED 5B); and *ii)* qualifications at the tertiary-type A (ISCED 5A) and *iii)* advanced research qualifications (ISCED 6). For some countries, data are not available for the categories requested. In such cases, the country has assigned graduates to the most appropriate category.

Table A4.2 shows the percentage distribution of qualifications among women by subject category. Tertiary graduates who receive their qualification in the reference year are divided into categories based on their subject of specialisation. These figures cover graduates from all tertiary degrees reported in Table A2.1.

Table A4.1.
Tertiary graduates, by field of study and level of education (2000)

		Education	Humanities and arts	Social sciences, business and law	Services	Engineering, manufacturing and construction	Agriculture	Health and welfare	Life sciences	Physical sciences	Mathematics and statistics	Computing	Not known or unspecified
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
OECD COUNTRIES													
Australia	A	11.3	13.9	36.0	2.8	7.9	1.2	15.0	5.6	1.1	0.5	4.6	a
	B	m	m	m	m	m	m	m	m	m	m	m	m
Austria	A	10.7	9.6	39.1	2.2	17.3	2.9	8.1	3.2	3.1	0.8	2.8	0.2
	B	32.8	1.8	2.9	7.9	33.9	5.6	12.9	n	1.4	0.3	0.6	a
Belgium[1]	A	7.3	15.5	36.3	1.6	12.5	3.5	13.3	6.3	2.0	0.6	1.0	n
	B	22.6	6.9	25.2	2.3	10.8	0.5	26.6	0.5	0.3	n	4.2	a
Canada	A	14.2	14.2	36.8	2.8	8.2	1.3	7.9	5.9	2.1	1.4	2.8	2.4
	B	4.5	7.8	29.0	12.8	16.9	3.3	18.6	0.1	0.1	n	6.0	0.8
Czech Republic	A	13.1	7.1	32.9	2.3	15.5	3.8	12.5	2.2	2.2	1.0	7.3	a
	B	a	8.1	35.4	8.0	6.1	2.6	35.1	a	a	a	4.7	a
Denmark	A	1.0	23.6	44.7	0.3	8.9	3.2	5.5	4.2	4.3	1.0	1.8	n
	B	19.2	2.2	7.9	5.4	12.4	1.1	49.2	n	n	n	2.7	0.1
Finland*	A	8.2	12.4	23.5	2.6	24.0	2.3	19.3	1.9	2.7	1.0	2.2	n
	B	0.3	4.2	22.1	16.9	19.5	1.5	31.5	a	a	a	4.0	a
France	A	8.3	19.0	36.6	2.8	11.2	0.8	2.9	6.7	5.8	2.8	2.7	0.3
	B	a	1.5	39.5	5.6	25.2	n	20.2	1.8	2.4	0.4	3.3	a
Germany	A	8.1	15.0	25.9	1.6	19.0	1.9	15.0	3.0	5.8	1.9	2.8	n
	B	10.9	1.2	9.6	9.6	13.7	3.4	50.3	a	n	a	0.3	1.0
Greece	A	m	m	m	m	m	m	m	m	m	m	m	m
	B	m	m	m	m	m	m	m	m	m	m	m	m
Hungary[1]	A	24.4	7.1	39.5	6.0	9.8	3.6	7.3	0.5	0.7	0.1	1.0	a
	B	n	n	38.9	53.5	4.2	n	n	n	n	3.4	n	a
Iceland	A	24.8	13.0	28.4	n	7.1	0.7	15.3	4.9	2.1	0.5	3.3	a
	B	6.4	14.0	47.5	n	n	n	n	n	n	n	32.2	a
Ireland	A	9.0	20.2	30.8	1.4	9.3	1.7	7.8	6.9	3.3	1.1	8.4	0.2
	B	0.9	6.9	31.5	6.0	19.6	0.7	8.9	2.7	4.5	n	17.8	0.5
Italy	A	4.3	14.2	37.3	0.3	16.0	2.1	17.3	3.0	1.8	2.8	0.9	n
	B	38.7	61.3	a	a	a	a	a	a	a	a	a	a
Japan	A	6.3	18.1	37.2	x(13)	21.3	3.4	5.2	4.4	x(9)	x(9)	x(9)	4.0
	B	8.1	17.9	9.6	22.7	16.9	0.7	18.1	n	x(9)	x(9)	x(9)	6.0
Korea	A	5.6	20.9	22.8	2.5	27.4	3.2	6.6	2.1	4.4	2.1	2.4	a
	B	8.6	14.8	19.7	5.0	38.0	1.3	8.9	n	0.1	n	3.4	a
Luxembourg	A	m	m	m	m	m	m	m	m	m	m	m	m
	B	25.2	a	59.4	a	5.8	a	9.6	a	a	a	a	a
Mexico	A	18.6	2.8	44.6	1.3	14.0	2.0	7.8	0.8	1.5	0.4	6.3	a
	B	n	0.7	34.4	3.8	37.7	1.8	7.2	0.6	a	0.1	13.7	a
Netherlands[2]	A	16.8	7.3	34.8	2.6	10.4	2.3	20.9	1.1	1.9	0.3	1.5	n
	B	a	a	39.7	11.1	2.3	a	37.7	a	a	a	9.2	a
New Zealand	A	12.6	21.3	28.3	2.0	5.6	1.4	12.9	n	11.3	0.1	1.6	2.8
	B	27.8	13.2	22.4	18.1	3.4	2.4	7.7	n	0.3	n	3.2	1.5
Norway	A	22.7	7.2	22.1	3.3	6.8	1.4	25.3	1.2	1.4	0.3	3.3	4.9
	B	a	5.5	51.0	5.2	14.9	0.1	1.0	n	a	a	21.6	0.7
Poland[3]	A	15.1	9.7	48.5	4.8	12.0	2.4	2.8	1.6	1.1	1.0	0.9	a
	B	100.0	a	a	a	a	a	a	a	a	a	a	a
Portugal[1]	A	18.7	8.5	38.6	3.7	12.4	1.7	10.6	0.9	1.0	0.7	3.0	a
	B	18.7	8.5	38.6	3.7	12.4	1.7	10.6	0.9	1.0	0.7	3.0	a
Slovak Republic	A	21.0	5.5	30.1	8.3	15.4	4.4	8.5	1.0	1.2	0.6	4.1	a
	B	3.2	12.5	5.0	7.1	6.9	1.5	63.7	n	n	n	n	a
Spain	A	13.6	9.3	36.0	3.2	12.9	3.0	11.9	2.5	3.3	1.4	2.9	n
	B	4.4	6.7	30.9	12.8	23.6	0.5	10.6	n	n	n	10.3	0.1
Sweden	A	18.8	5.7	21.6	1.0	20.5	1.0	22.8	2.3	2.4	0.6	3.1	n
	B	4.9	6.3	14.6	14.3	23.3	7.1	8.9	0.1	0.1	0.2	20.5	a
Switzerland	A	9.9	11.8	31.1	3.8	15.7	1.4	11.4	3.3	4.3	1.1	5.8	0.4
	B	14.4	2.7	39.3	10.5	12.6	1.4	12.3	n	n	n	6.8	n
Turkey	A	23.0	11.2	24.2	2.8	13.3	5.1	9.5	2.1	5.3	2.8	0.7	a
	B	a	3.7	34.8	6.8	37.6	6.3	5.4	a	n	a	5.4	a
United Kingdom	A	10.0	15.7	28.8	n	9.9	1.1	8.3	6.0	5.0	1.3	4.2	9.8
	B	6.1	7.6	22.6	n	9.2	1.6	28.4	1.6	1.5	0.3	7.1	13.9
United States	A	13.1	14.2	42.2	2.4	6.5	2.3	9.8	4.1	1.5	0.9	2.8	0.3
	B	2.5	0.2	33.4	8.6	18.6	1.9	27.9	a	a	a	6.2	0.8
Country mean	*A*	*13.2*	*12.6*	*33.5*	*2.5*	*13.2*	*2.3*	*11.5*	*3.1*	*3.0*	*1.1*	*3.1*	*0.9*
	B	*13.0*	*7.6*	*25.8*	*9.0*	*14.7*	*2.4*	*18.8*	*n*	*n*	*n*	*6.8*	*0.9*
NON-OECD COUNTRY													
Israel	A	18.2	13.6	43.1	m	8.5	0.7	5.7	2.7	1.7	5.9	x(11)	a
	B	17.7	7.5	18.2	a	47.6	a	3.5	a	a	n	x(11)	5.4

Note: Column 1 specifies the level of education, where A equals tertiary-type A and advanced research programmes, and B equals tertiary-type B programmes.
Note: x indicates that data are included in another column. The column reference is shown in brackets after "x". *e.g.,* x(2) means that data are included in column 2.
1. Excludes tertiary-type B second degree programmes.
2. Excludes advanced research programmes.
3. Excludes tertiary-type A second degree programmes and advanced research programmes.
* See Annex 3 for notes (*www.oecd.org/els/education/eag2002*).
Source: OECD.

A4

Table A4.2.
Percentage of tertiary qualifications awarded to women, by type of tertiary education and by subject category (2000)

	All fields of study					Health and welfare		Life sciences, physical sciences and agriculture		Mathematics and computer science		Humanities, arts and education		Social sciences, business, law and services		Engineering, manufacturing and construction	
	Tertiary-type B (First degree)	Tertiary-type B (Second degree)	Tertiary-type A (First degree)	Tertiary-type A (Second degree)	Advanced research degrees	Tertiary-type B education	Tertiary-type A and advanced research programmes	Tertiary-type B education	Tertiary-type A and advanced research programmes	Tertiary-type B education	Tertiary-type A and advanced research programmes	Tertiary-type B education	Tertiary-type A and advanced research programmes	Tertiary-type B education	Tertiary-type A and advanced research programmes	Tertiary-type B education	Tertiary-type A and advanced research programmes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
OECD COUNTRIES																	
Australia	m	m	57	56	40	m	76	m	50	m	27	m	70	m	52	m	21
Austria	48	79	48	32	36	78	59	24	46	39	15	76	66	72	49	11	18
Belgium	61	m	50	53	34	79	59	33	40	12	25	70	65	58	52	22	21
Canada	57	n	59	52	39	84	74	50	53	29	28	70	68	62	58	17	23
Czech Republic	72	a	51	53	29	91	70	52	45	39	12	58	71	70	54	29	27
Denmark	66	75	51	49	38	85	59	27	48	10	28	69	69	39	44	32	26
Finland	65	a	59	59	45	89	84	47	51	42	35	71	77	70	65	21	19
France	54	a	57	56	41	81	60	47	49	19	31	57	73	68	59	13	24
Germany	62	a	46	a	34	79	56	13	38	14	23	87	69	50	43	7	20
Greece	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Hungary	69	m	60	35	38	a	70	a	42	48	17	a	71	73	51	14	21
Iceland	48	a	67	59	50	a	82	a	57	34	22	65	83	51	57	a	25
Ireland	52	52	55	60	47	93	75	60	53	50	41	61	69	61	57	11	24
Italy	64	a	56	56	53	a	58	a	51	a	54	64	82	a	55	a	28
Japan	68	a	37	23	19	81	50	49	38	x(8)	x(9)	87	67	75	26	16	9
Korea	54	34	47	30	20	82	50	37	42	51	49	71	70	57	40	32	23
Luxembourg	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Mexico	40	m	52	m	36	69	61	41	41	49	43	79	65	48	55	23	22
Netherlands	56	a	54	66	m	79	76	a	37	12	16	a	71	48	49	8	13
New Zealand	65	66	64	54	43	83	79	35	46	26	34	70	73	65	53	31	33
Norway	47	a	64	52	33	92	82	m	46	36	15	70	75	57	48	10	27
Poland	83	a	m	68	m	a	68	a	64	a	58	83	78	a	64	a	24
Portugal	70	m	65	x(3)	49	80	77	59	61	34	37	88	78	67	64	36	35
Slovak Republic	81	a	52	a	38	94	69	71	41	n	17	67	71	65	50	33	30
Spain	52	a	59	m	44	80	76	25	52	25	34	68	72	68	60	16	27
Sweden	53	a	60	93	37	95	79	59	53	50	39	54	75	63	57	25	25
Switzerland	44	42	42	26	31	81	54	11	33	18	16	75	62	38	35	5	11
Turkey	43	a	41	39	37	57	53	48	44	30	42	66	45	56	39	26	24
United Kingdom	59	x(1)	54	54	38	88	71	41	52	26	27	59	67	57	55	12	20
United States	60	a	57	56	44	87	75	38	51	43	33	77	68	64	53	14	21
Country mean	*59*	*44*	*54*	*51*	*38*	*83*	*68*	*41*	*47*	*31*	*30*	*70*	*70*	*60*	*52*	*19*	*23*
NON-OECD COUNTRIES																	
Argentina[1]	70	77	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Brazil[1]	m	m	61	m	54	m	m	m	m	m	m	m	m	m	m	m	m
Chile[1]	48	a	51	51	29	m	m	m	m	m	m	m	m	m	m	m	m
China[1]	m	a	m	34	20	m	m	m	m	m	m	m	m	m	m	m	m
India[1]	25	a	40	40	m	m	m	m	m	m	m	m	m	m	m	m	m
Indonesia[2]	28	m	42	m	38	m	m	m	m	m	m	m	m	m	m	m	m
Israel	53	a	62	55	44	m	m	m	m	m	m	m	m	m	m	m	m
Jamaica[3]	68	m	74	66	x(4)	m	m	m	m	m	m	m	m	m	m	m	m
Jordan	72	a	47	36	17	m	m	m	m	m	m	m	m	m	m	m	m
Malaysia[1]	49	66	57	38	30	m	m	m	m	m	m	m	m	m	m	m	m
Paraguay[1]	76	85	63	68	m	m	m	m	m	m	m	m	m	m	m	m	m
Russian Federation[2]	m	a	m	a	40	m	m	m	m	m	m	m	m	m	m	m	m
Thailand	53	n	57	n	49	m	m	m	m	m	m	m	m	m	m	m	m
Tunisia	46	a	49	37	m	m	m	m	m	m	m	m	m	m	m	m	m
Uruguay[1]	77	83	56	83	55	m	m	m	m	m	m	m	m	m	m	m	m
Zimbabwe[2]	51	a	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m

Note: x indicates that data are included in another column. The column reference is shown in brackets after "x". *e.g.*, x(2) means that data are included in column 2.
1. Year of reference 1999.
2. Year of reference 2001.
3. Public institutions only.
Source: OECD.

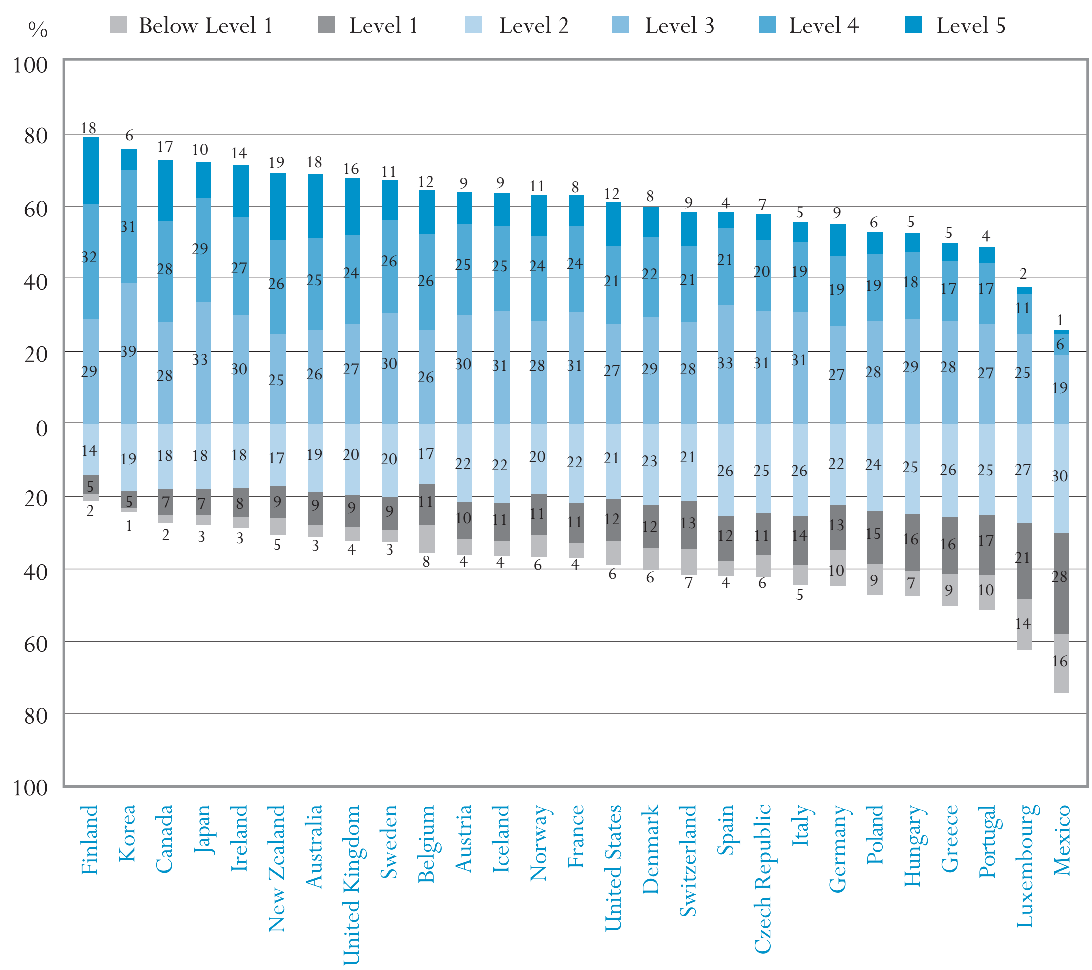
READING LITERACY OF 15-YEAR-OLDS

- On average across OECD countries, 10 per cent of 15-year-olds have acquired Level 5 literacy skills, which involve evaluation of information and building of hypotheses, drawing on specialised knowledge, and accommodating concepts contrary to expectations. However, this percentage varies from 19 per cent in Finland and New Zealand to below 1 per cent in Mexico.
- An average of 12 per cent of 15-year-olds have only acquired the most basic literacy skills at Level 1 and a further 6 per cent fall even below that.
- Some countries, most notably Finland, Japan and Korea, achieve both a high level of average performance and a narrow range of disparities of student performance.

Chart A5.1.

Reading proficiency of 15-year-olds (2000)

Percentage of 15-year-olds at each level of proficiency on the PISA reading literacy scale



Countries are ranked in descending order of the percentage of students at Levels 3, 4 and 5 on the PISA reading literacy scale.
Source: OECD PISA database, 2001. Table A5.1. See Annex 3 for notes on methodology *(www.oecd.org/els/education/eag2002)* and *www.pisa.oecd.org*.

Policy context

This indicator shows the performance of 15-year-olds in reading literacy.

The ability to read, understand, and use information is at the heart of learning both in school and throughout life. This indicator shows the performance of 15-year-olds on tasks based on a concept of reading literacy that goes beyond the notion of decoding written material and literal comprehension. Reading in PISA incorporates understanding and reflecting on texts. Literacy involves the ability to use written information to fulfil goals, and the consequent ability of complex modern societies to use written information effectively.

Evidence and explanations

Percentage of 15-year-olds proficient at each level of reading literacy

PISA provides an interpretative framework for performance levels in reading literacy.

This indicator examines reading literacy in several ways (see Box A5.1 for an explanation of reading literacy in PISA). First, it describes proficiency in terms of the range of scores that 15-year-olds achieve in each country. Proficiency in reading is examined at five levels, each representing tasks of increasing complexity, with Level 5 being the highest. Second, this indicator describes performance in terms of the mean scores achieved by 15-year-olds and the distribution of scores across student populations.

Box A5.1. What is reading literacy in PISA?

Reading Literacy is the ability to understand, use and reflect on written texts in order to achieve one's goals, to develop one's own knowledge and potential, and to participate effectively in society. This definition goes beyond the notion that reading means decoding written material and literal comprehension. Rather, reading also incorporates understanding and reflecting on texts, for a variety of reasons and in a variety of contexts. PISA's assessment of reading literacy reflects three dimensions: aspect of reading task; form of reading material; and the use for which the text is constructed.

What scales are reported? PISA's assessment of reading literacy is reported on three scales. A "retrieving information" scale is based on students' ability to locate information in a text. An "interpreting" scale is based on the ability to construct meaning and draw inferences from written information. A "reflection and evaluation" scale is based on students' ability to relate a text to their knowledge, ideas and experiences. In addition, a combined reading literacy scale summarises the results from the three reading scales. Indicator A5 focuses on the combined scale only which is referred to as the "reading literacy scale".

What do the scale scores mean? The scores on each scale represent degrees of proficiency in each dimension or aspect of reading literacy (here, the combined scale). For example, a low score on a scale indicates that a student has limited skills, whereas a high score indicates that a student has advanced skills in this area.

What are proficiency levels? In an attempt to capture this progression of difficulty, each of the reading literacy scales is divided into five levels based on the type of knowledge and skills students need to demonstrate at a particular level. Students at a particular level not only demonstrate the knowledge and skills associated with that level but also the proficiencies defined by lower levels. For instance, all students proficient at Level 3 are also proficient at Levels 1 and 2.

Chart A5.1 presents an overall profile of proficiency on the reading literacy scale with the length of the coloured components of the bars showing the percentage of 15-year-olds proficient at each level (see Box A5.2). As can be seen from the chart, the percentage of students reaching each level of literacy and the patterns of distribution across the levels varies from country to country. Across countries, on average, 10 per cent of students reach proficiency Level 5, 32 per cent reach Level at least 4 (*i.e.*, Levels 4 and 5), 61 per cent reach at least Level 3, 82 per cent reach at least Level 2, and 94 per cent reach at least Level 1.

10 per cent of 15-year-olds in OECD countries have acquired Level 5 literacy skills, which involve to evaluate information and build hypotheses, draw on specialised knowledge, and to accommodate concepts contrary to expectations but this proportion ranges across countries from 19 to less than 1 per cent.

Examining individual countries' performance level by level shows that, in five countries (Australia, Canada, Finland, New Zealand and the United Kingdom), 15 per cent or more of students reach the highest level of proficiency in reading literacy. In an additional three countries (Belgium, Ireland and the United States), between 12 and 15 per cent of students reach this level. Only five per cent or less of the students in Brazil, Greece, Latvia, Luxembourg, Mexico, Portugal, Spain and the Russian Federation reach the highest level of proficiency.

Box A5.2. What can students at each proficiency level do and what scores are associated with the levels?

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

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

Students proficient at **Level 3 (481 to 552 points)** 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 familiar everyday knowledge.

Students proficient at **Level 2 (408 to 480 points)** 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.

Students proficient at **Level 1 (335 to 407 points)** are capable of completing only the least complex reading tasks developed for PISA, such as locating a single piece of information, identifying the main theme of a text or making a simple connection with everyday knowledge.

Students performing below **Level 1 (below 335 points)** 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.

A large proportion of high performers typically means fewer low performers,but in some countries, there are large disparities.

Although there is a general tendency among countries with a high proportion of 15-year-olds scoring at Level 5 to have fewer students below the lowest level of proficiency (see Finland, for example), this is not always the case. Belgium and the United States, for example, stand out in showing an above-average share of performers at the highest proficiency level while, at the same time, showing an above-average proportion of students scoring below Level 1.

Half of all 15-year-olds in Finland and at least 40 per cent of students in five other countries reach at least Level 4 on the reading literacy scale. With the exception of Luxembourg and Mexico, at least one in five students in each OECD country reaches at least Level 4. In Brazil, the country with the lowest overall performance in reading literacy, only about 4 per cent of students score at Level 4 or above.

In one-third of OECD countries, more than two-thirds of 15-year-olds are proficient at least at Level 3.

In one-third of OECD countries, between 67 and 80 per cent of 15-year-old students are proficient at least at Level 3 on the reading literacy scale: Australia, Canada, Finland, Ireland, Japan, Korea, New Zealand, Sweden and the United Kingdom. Using these nine countries to explore the question "is the pattern of proficiency similar across countries?" several patterns emerge. In Canada and Finland, for instance, relatively large proportions of students reach Level 5 and at least 90 per cent of students in each country reach at least Level 2 – these countries show strong results across the reading literacy scale. In Australia, Ireland, New Zealand and the United Kingdom, there are large numbers of students at the highest level, but over 10 per cent of students perform at or below Level 1. These countries perform well in getting students to higher levels of proficiency but succeed less well than Canada or Finland in reducing the proportion with low skills. The opposite is true in Korea, where less than 6 per cent of students are at Level 1 or below, but where a below-average proportion (6 per cent) reach the highest level of proficiency.

In every OECD country, at least half of all students are at Level 2 or higher. Interestingly, in Spain, where only 4 per cent of students reach Level 5, an above-average 84 per cent reach at least Level 2. However, over 40 per cent of students in Spain have Level 2 as their highest proficiency level.

The simplest tasks in PISA require students to do more than just read words fluently…

Reading literacy, as defined in PISA, focuses on the knowledge and skills required to apply "reading to learn" rather than on the technical skills acquired in "learning to read". Since comparatively few young adults in OECD countries have not acquired technical reading skills, PISA does not therefore seek to measure such things as the extent to which 15-year-old students are fluent readers or how well they spell or recognise words. In line with most contemporary views about reading literacy, PISA focuses on measuring the extent to which individuals are able to construct, expand and reflect on the meaning of what they have read in a wide range of texts common both within and beyond school. The simplest reading tasks that can still be associated with this notion of reading literacy are those at Level 1. Students proficient at this level are capable of completing only the least complex reading tasks developed for

PISA, such as locating a single piece of information, identifying the main theme of a text or making a simple connection with everyday knowledge.

...and while students below Level 1 may have the technical capacity to read, they may face serious difficulties in future life...

Students performing below 335 points, *i.e.,* below Level 1, are not capable of the most basic type of reading that PISA seeks to measure. This does not mean that they have no literacy skills. In fact, most of these students can probably read in a technical sense, and the majority of them (54 per cent on average across OECD countries) are able to solve successfully at least 10 per cent of the non-multiple choice reading tasks in PISA 2000 (and 6 per cent correctly solve one-quarter of them). Nonetheless, their pattern of answers in the assessment is such that they would be expected to solve fewer than half of the tasks in a test made up of items drawn solely from Level 1, and therefore perform below Level 1. Such students show serious difficulties in using reading literacy as an effective tool to advance and extend their knowledge and skills in other areas. Students with literacy skills below Level 1 may, therefore, be at risk not only of difficulties in their initial transition from education to work but also of failure to benefit from further education and learning opportunities throughout life.

...and, along with those at Level 1, may not acquire the necessary literacy skills to sufficiently benefit from educational opportunities.

Education systems with large proportions of students performing below, or even at, Level 1 should be concerned that significant numbers of their students may not be acquiring the necessary literacy knowledge and skills to benefit sufficiently from their educational opportunities. This situation is even more troublesome in light of the extensive evidence suggesting that it is difficult in later life to compensate for learning gaps in initial education. Adult literacy skills and participation in continuing education and training are strongly related, even after controlling for other characteristics affecting participation in training.

The percentage of students at or below Level 1 varies widely, from a few per cent to nearly half...

In the combined OECD area, 12 per cent of students perform at Level 1, and 6 per cent below Level 1, but there are wide differences between countries. In Finland and Korea, only around 5 per cent of students perform at Level 1, and less than 2 per cent below it, but these countries are exceptions. In all other OECD countries, between 9 and 44 per cent of students perform at or below Level 1. Over 2 per cent and, in half of the OECD countries over 5 per cent, perform below Level 1.

...and, in some countries, a consider-able minority do not reach Level 1.

The countries with 20 per cent or more of students at Level 1 or below are, in order, Brazil, Mexico, Luxembourg, Latvia, the Russian Federation, Portugal, Greece, Poland, Hungary, Germany, Liechtenstein and Switzerland. In Brazil, Mexico, Luxembourg, Latvia, Portugal and Germany, between close to 10 and 23 per cent of students do not reach Level 1, *i.e.*, are unable routinely to show the most basic skills that PISA seeks to measure. This is most remarkable in the case of Germany, which has the relatively high figure of 9 per cent of its students performing at Level 5.

National means and distribution of performance in reading literacy

Average scores can usefully summarise country performances...

Another way to summarise student performance and to compare the relative standing of countries in terms of student performance in PISA 2000 is to display the mean scores for students in each country. To the extent that high average performance at age 15 can be considered predictive of a highly skilled future workforce, countries with high average performance will have an important economic and social advantage. It should be noted, however, that average performance charts often mask significant variation in performance within countries, reflecting different performance among many different groups of students.

…but mask wide differences in student performance within countries.

As in previous international studies of student performance, such as the Third International Mathematics and Science Study (TIMSS), only around one-tenth of PISA's total variation in student performance lies between countries and can, therefore, be captured through a comparison of country averages. The remaining variation of student performance occurs within countries, that is between educational programmes, between schools, and between students within schools. Thus, this indicator also presents information on the distribution of reading literacy scores, examining the range of performance between the top and bottom quarter of students in each country.

Finland shows unparalleled overall performance, almost two-thirds of a proficiency level ahead of the OECD average.

On the reading literacy scale, students from Finland perform on average higher than students from any other country participating in the study (see Chart A5.2). Their mean score, 546 points, is almost two-thirds of a proficiency level above the OECD average of 500 points (or in statistical terms, almost half the international standard deviation above the mean). Twelve other countries, Australia, Austria, Belgium, Canada, Iceland, Ireland, Japan, Korea, the Netherlands, New Zealand, Sweden and the United Kingdom, score above the OECD mean. Five countries perform at or about the OECD mean, and 14 countries, including the four non-OECD countries, perform significantly below the OECD mean.

High average scores are not enough: countries also look to raise the level of achievement of poor performers.

Looking at the distribution in student performance (Table A5.2) shows that the variation in student performance on the reading literacy scale within countries is large. The variation within every country far exceeds the range of country mean scores. The difference between the 75th and 25th percentiles, which covers the middle half of the national performance distribution, exceeds the magnitude of one proficiency level (72 score points) in all countries, and about two times the magnitude of one proficiency level in Australia, Belgium, Germany and New Zealand. (The OECD average on this measure is 1.8 times the magnitude of one proficiency level.)

Are these observed disparities inevitable? That is hard to say…

Together, these findings suggest that educational systems in many countries face significant challenges in addressing the needs of all students, including those most in need as well as those performing exceptionally well.

…but some countries contain them within a far narrower range than others…

One can also observe that countries with similar levels of average performance show considerable variation in disparities of student achievement. For example, Korea and the United Kingdom both show above-average mean performance on the reading literacy scale at around 525 score points. The difference between the 75th and 25th percentile in Korea is 92 points, significantly below the OECD average, but in the United Kingdom it is 137 score points, similar to the OECD average. A similar result can be observed for countries scoring below average. Italy and Germany each perform at around 485 score points,

Chart A5.2

Multiple comparisons of mean performance on the PISA reading literacy scale (2000)

	Mean	S.E.	Finland	Canada	New Zealand	Australia	Ireland	Korea	United Kingdom	Japan	Sweden	Austria	Belgium	Iceland	Norway	France	United States	Denmark	Switzerland	Spain	Czech Republic	Italy	Germany	Liechtenstein	Hungary	Poland	Greece	Portugal	Russian Fed.	Latvia	Luxembourg	Mexico	Brazil
Mean			546	534	529	528	527	525	523	522	516	507	507	507	505	505	504	497	494	493	492	487	484	483	480	479	474	470	462	458	441	422	396
S.E.			(2.6)	(1.6)	(2.8)	(3.5)	(3.2)	(2.4)	(2.6)	(5.2)	(2.2)	(2.4)	(3.6)	(1.5)	(2.8)	(2.7)	(7.0)	(2.4)	(4.2)	(2.7)	(2.4)	(2.9)	(2.5)	(4.1)	(4.0)	(4.5)	(5.0)	(4.5)	(4.2)	(5.3)	(1.6)	(3.3)	(3.1)
Finland	546	(2.6)		▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Canada	534	(1.6)	▽		○	○	○	▲	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
New Zealand	529	(2.8)	▽	○		○	○	○	○	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Australia	528	(3.5)	▽	○	○		○	○	○	○	○	▲	▲	▲	▲	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Ireland	527	(3.2)	▽	○	○	○		○	○	○	○	▲	▲	▲	▲	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Korea	525	(2.4)	▽	▽	○	○	○		○	○	○	▲	▲	▲	▲	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
United Kingdom	523	(2.6)	▽	▽	○	○	○	○		○	○	▲	▲	▲	▲	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Japan	522	(5.2)	▽	○	○	○	○	○	○		○	○	○	○	○	○	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Sweden	516	(2.2)	▽	▽	▽	○	○	○	○	○		○	○	▲	○	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Austria	507	(2.4)	▽	▽	▽	▽	▽	▽	▽	○	○		○	○	○	○	○	○	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Belgium	507	(3.6)	▽	▽	▽	▽	▽	▽	▽	○	○	○		○	○	○	○	○	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Iceland	507	(1.5)	▽	▽	▽	▽	▽	▽	▽	○	▽	○	○		○	○	○	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Norway	505	(2.8)	▽	▽	▽	▽	▽	▽	▽	○	○	○	○	○		○	○	○	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
France	505	(2.7)	▽	▽	▽	▽	▽	▽	▽	○	▽	○	○	○	○		○	○	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
United States	504	(7.0)	▽	▽	▽	○	○	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○	○	○	○	▲	▲	▲	▲	▲	▲	▲
Denmark	497	(2.4)	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○	▽	○	○	○		○	○	○	○	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲
Switzerland	494	(4.2)	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○	○	○	○	○		○	○	○	○	○	○	○	▲	▲	▲	▲	▲	▲	▲
Spain	493	(2.7)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○		○	○	○	○	○	○	▲	▲	▲	▲	▲	▲	▲
Czech Republic	492	(2.4)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○	○		○	○	○	○	○	▲	▲	▲	▲	▲	▲	▲
Italy	487	(2.9)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○	○	○		○	○	○	○	○	▲	▲	▲	▲	▲	▲
Germany	484	(2.5)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	▽	○	○	○	○		○	○	○	○	○	▲	▲	▲	▲	▲
Liechtenstein	483	(4.1)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○	○	○	○	○		○	○	○	○	▲	▲	▲	▲	▲
Hungary	480	(4.0)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	▽	○	○	○	○	○	○		○	○	○	▲	▲	▲	▲	▲
Poland	479	(4.5)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	▽	○	○	○	○	○	○	○		○	○	○	○	▲	▲	▲
Greece	474	(5.0)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○	○	○		○	○	○	▲	▲	▲
Portugal	470	(4.5)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○	○	○		○	○	▲	▲	▲
Russian Fed.	462	(4.2)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○		○	▲	▲	▲
Latvia	458	(5.3)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○	○		○	▲	▲
Luxembourg	441	(1.6)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○		▲	▲
Mexico	422	(3.3)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽		▲
Brazil	396	(3.1)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	
Upper rank*			1	2	2	2	3	4	5	3	9	11	11	11	11	11	10	16	16	17	17	19	21	20	21	21	23	24	27	27	30	31	32
Lower rank*			1	4	8	9	9	9	9	10	11	16	16	15	16	16	20	19	21	21	21	24	25	26	26	27	28	28	29	29	30	31	32

**Note*: 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 per cent likelihood.

Instructions

Read across the row for a country to compare performance with the countries listed along the top of the chart. The symbols indicate whether the mean performance of the country in the row is significantly lower than that of the comparison country, significantly higher than that of the comparison country, or if there is no statistically significant difference between the mean performance of the two countries.

Note: Countries are presented in descending order of mean performance on the PISA reading literacy scale. Due to low response rates, the Netherlands is excluded from the figure. Assuming negligible to moderate levels of bias due to non-response, the position of the Netherlands may be expected, with 95 per cent confidence, to lie between 2nd and 14th place among countries.

▲ Mean performance statistically significantly higher than in comparison country.

○ No statistically significant difference from comparison country.

▽ Mean performance statistically significantly lower than in comparison country.

Statistically significantly above the OECD average

Not statistically significantly different from the OECD average

Statistically significantly below the OECD average

Source: OECD PISA database, 2001. *See Annex 3* for notes on methodology *(www.oecd.org/els/education/eag2002)* and *www.pisa.oecd.org.*

significantly below the OECD average. In Italy the difference between the 75th and 25th percentile is 124 points, but in Germany, it is 146 points. Bringing the bottom quarter of students closer to the mean is one way for countries with wide internal disparities to raise overall performance.

...and some countries succeed in combining high average performance with low disparities.

Finally, comparing the range of achievement within a country with its average performance shows that some countries attain both relatively low differences between top and bottom-performing students and relatively high levels of overall performance. There is a tendency for high performing countries to show relatively small disparities. For example, the three countries with the smallest differences between the 75th and 25th percentiles, Finland, Japan and Korea are also among the best performing countries in reading literacy. By contrast, one of the three countries with the highest achievement differences, Germany, scores significantly below the OECD average.

Definitions and methodologies

The achievement scores are based on assessments administered as part of the Programme for International Student Assessment (PISA) undertaken by the OECD during 2000.

The target population studied for this indicator was 15-year-old students. Operationally, this refers to students aged between 15 years and 3 (completed) months and 16 years and 2 (completed) months at the beginning of the testing period and enrolled in an educational institution, regardless of the grade level or type of institutions in which they were enrolled and of whether they participated in school full-time or part-time.

To facilitate the interpretation of the scores assigned to students in PISA, the mean score for reading literacy performance across OECD countries was set at 500 and the standard deviation at 100, with the data weighted so that each OECD country contributed equally. These reference points anchor PISA's measurement of student proficiency.

For notes on standard errors, significance tests, and multiple comparisons see Annex 3 at *www.oecd.org/els/education/eag2002*.

A5

Table A5.1.
Reading proficiency of 15-year-olds (2000)
Percentage of 15-year-olds at each level of proficiency on the PISA reading literacy scale

		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*)	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD COUNTRIES	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 total	*6.2*	*(0.4)*	*12.1*	*(0.4)*	*21.8*	*(0.4)*	*28.6*	*(0.4)*	*21.8*	*(0.4)*	*9.4*	*(0.4)*
	Country mean	*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)

Source: OECD PISA database, 2001. See Annex 3 for notes on methodology (*www.oecd.org/els/education/eag2002*) and *www.pisa.oecd.org*.

Table A5.2.
Variation in performance in reading literacy of 15-year-olds (2000)
Performance of 15-year-olds on the PISA reading literacy scale, by percentile

		Mean		Standard deviation		Percentiles											
						5th		10th		25th		75th		90th		95th	
		Mean score	S.E.	S.D.	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.
OECD COUNTRIES	Australia	528	(3.5)	102	(1.6)	354	(4.8)	394	(4.4)	458	(4.4)	602	(4.6)	656	(4.2)	685	(4.5)
	Austria	507	(2.4)	93	(1.6)	341	(5.4)	383	(4.2)	447	(2.8)	573	(3.0)	621	(3.2)	648	(3.7)
	Belgium	507	(3.6)	107	(2.4)	308	(10.3)	354	(8.9)	437	(6.6)	587	(2.3)	634	(2.5)	659	(2.4)
	Canada	534	(1.6)	95	(1.1)	371	(3.8)	410	(2.4)	472	(2.0)	600	(1.5)	652	(1.9)	681	(2.7)
	Czech Republic	492	(2.4)	96	(1.9)	320	(7.9)	368	(4.9)	433	(2.8)	557	(2.9)	610	(3.2)	638	(3.6)
	Denmark	497	(2.4)	98	(1.8)	326	(6.2)	367	(5.0)	434	(3.3)	566	(2.7)	617	(2.9)	645	(3.6)
	Finland	546	(2.6)	89	(2.6)	390	(5.8)	429	(5.1)	492	(2.9)	608	(2.6)	654	(2.8)	681	(3.4)
	France	505	(2.7)	92	(1.7)	344	(6.2)	381	(5.2)	444	(4.5)	570	(2.4)	619	(2.9)	645	(3.7)
	Germany	484	(2.5)	111	(1.9)	284	(9.4)	335	(6.3)	417	(4.6)	563	(3.1)	619	(2.8)	650	(3.2)
	Greece	474	(5.0)	97	(2.7)	305	(8.2)	342	(8.4)	409	(7.4)	543	(4.5)	595	(5.1)	625	(6.0)
	Hungary	480	(4.0)	94	(2.1)	320	(5.6)	354	(5.5)	414	(5.3)	549	(4.5)	598	(4.4)	626	(5.5)
	Iceland	507	(1.5)	92	(1.4)	345	(5.0)	383	(3.6)	447	(3.1)	573	(2.2)	621	(3.5)	647	(3.7)
	Ireland	527	(3.2)	94	(1.7)	360	(6.3)	401	(6.4)	468	(4.3)	593	(3.6)	641	(4.0)	669	(3.4)
	Italy	487	(2.9)	91	(2.7)	331	(8.5)	368	(5.8)	429	(4.1)	552	(3.2)	601	(2.7)	627	(3.1)
	Japan	522	(5.2)	86	(3.0)	366	(11.4)	407	(9.8)	471	(7.0)	582	(4.4)	625	(4.6)	650	(4.3)
	Korea	525	(2.4)	70	(1.6)	402	(5.2)	433	(4.4)	481	(2.9)	574	(2.6)	608	(2.9)	629	(3.2)
	Luxembourg	441	(1.6)	100	(1.5)	267	(5.1)	311	(4.4)	378	(2.8)	513	(2.0)	564	(2.8)	592	(3.5)
	Mexico	422	(3.3)	86	(2.1)	284	(4.4)	311	(3.4)	360	(3.6)	482	(4.8)	535	(5.5)	565	(6.3)
	New Zealand	529	(2.8)	108	(2.0)	337	(7.4)	382	(5.2)	459	(4.1)	606	(3.0)	661	(4.4)	693	(6.1)
	Norway	505	(2.8)	104	(1.7)	320	(5.9)	364	(5.5)	440	(4.5)	579	(2.7)	631	(3.1)	660	(4.6)
	Poland	479	(4.5)	100	(3.1)	304	(8.7)	343	(6.8)	414	(5.8)	551	(6.0)	603	(6.6)	631	(6.0)
	Portugal	470	(4.5)	97	(1.8)	300	(6.2)	337	(6.2)	403	(6.4)	541	(4.5)	592	(4.2)	620	(3.9)
	Spain	493	(2.7)	85	(1.2)	344	(5.8)	379	(5.0)	436	(4.6)	553	(2.6)	597	(2.6)	620	(2.9)
	Sweden	516	(2.2)	92	(1.2)	354	(4.5)	392	(4.0)	456	(3.1)	581	(3.1)	630	(2.9)	658	(3.1)
	Switzerland	494	(4.2)	102	(2.0)	316	(5.5)	355	(5.8)	426	(5.5)	567	(4.7)	621	(5.5)	651	(5.3)
	United Kingdom	523	(2.6)	100	(1.5)	352	(4.9)	391	(4.1)	458	(2.8)	595	(3.5)	651	(4.3)	682	(4.9)
	United States	504	(7.1)	105	(2.7)	320	(11.7)	363	(11.4)	436	(8.8)	577	(6.8)	636	(6.5)	669	(6.8)
	OECD total	*499*	*(2.0)*	*100*	*(0.8)*	*322*	*(3.4)*	*363*	*(3.3)*	*433*	*(2.5)*	*569*	*(1.6)*	*622*	*(2.0)*	*653*	*(2.1)*
	Country mean	*500*	*(0.6)*	*100*	*(0.4)*	*324*	*(1.3)*	*366*	*(1.1)*	*435*	*(1.0)*	*571*	*(0.7)*	*623*	*(0.8)*	*652*	*(0.8)*
NON-OECD COUNTRIES	Brazil	396	(3.1)	86	(1.9)	255	(5.0)	288	(4.5)	339	(3.4)	452	(3.4)	507	(4.2)	539	(5.5)
	Latvia	458	(5.3)	102	(2.3)	283	(9.7)	322	(8.2)	390	(6.9)	530	(5.3)	586	(5.8)	617	(6.6)
	Liechtenstein	483	(4.1)	96	(3.9)	310	(15.9)	350	(11.8)	419	(9.4)	551	(5.8)	601	(7.1)	626	(8.2)
	Russian Federation	462	(4.2)	92	(1.8)	306	(6.9)	340	(5.4)	400	(5.1)	526	(4.5)	579	(4.4)	608	(5.3)

Source: OECD PISA database, 2001. See Annex 3 for notes on methodology (*www.oecd.org/els/education/eag2002*) and *www.pisa.oecd.org*.

MATHEMATICAL AND SCIENTIFIC LITERACY OF 15-YEAR-OLDS

- 15-year-olds in Japan display the highest mean scores in mathematical literacy, although their scores cannot be distinguished statistically from students in two other top-performing countries, Korea and New Zealand. On the scientific literacy scale, students in Korea and Japan demonstrate the highest average performance.

- While there are large differences in mean performance among countries, the variation of performance among 15-year-olds within each country is many times larger. However, wide disparities in performance are not a necessary condition for a country to attain a high level of overall performance. On the contrary, five of the countries with the smallest variation in performance on the mathematical literacy scale, namely Canada, Finland, Iceland, Japan and Korea, all perform significantly above the OECD average, and four of them – Canada, Finland, Japan and Korea – are among the six best-performing countries in mathematical literacy.

A6

Chart A6.1

Multiple comparisons of mean performance on the PISA mathematical literacy scale (2000)

	Mean	S.E.	Japan	Korea	New Zealand	Finland	Australia	Canada	Switzerland	United Kingdom	Belgium	France	Austria	Denmark	Iceland	Liechtenstein	Sweden	Ireland	Norway	Czech Republic	United States	Germany	Hungary	Russian Fed.	Spain	Poland	Latvia	Italy	Portugal	Greece	Luxembourg	Mexico	Brazil
Mean			557	547	537	536	533	533	529	529	520	517	515	514	514	514	510	503	499	498	493	490	488	478	476	470	463	457	454	447	446	387	334
		S.E.	(5.5)	(2.8)	(3.1)	(2.1)	(3.5)	(1.4)	(4.4)	(2.5)	(3.9)	(2.7)	(2.5)	(2.4)	(2.3)	(7.0)	(2.5)	(2.7)	(2.8)	(2.8)	(7.6)	(2.5)	(4.0)	(5.5)	(3.1)	(5.5)	(4.5)	(2.9)	(4.1)	(5.6)	(2.0)	(3.4)	(3.7)
Japan	557	(5.5)		○	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Korea	547	(2.8)	○		○	○	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
New Zealand	537	(3.1)	○	○		○	○	○	○	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Finland	536	(2.1)	▽	○	○		○	○	○	○	▲	▲	▲	▲	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Australia	533	(3.5)	▽	○	○	○		○	○	○	○	▲	▲	▲	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Canada	533	(1.4)	▽	▽	○	○	○		○	○	▲	▲	▲	▲	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Switzerland	529	(4.4)	▽	▽	○	○	○	○		○	○	○	○	○	○	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
United Kingdom	529	(2.5)	▽	▽	○	○	○	○	○		○	▲	▲	▲	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Belgium	520	(3.9)	▽	▽	▽	▽	○	▽	○	○		○	○	○	○	○	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
France	517	(2.7)	▽	▽	▽	▽	▽	▽	○	▽	○		○	○	○	○	○	▲	▲	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Austria	515	(2.5)	▽	▽	▽	▽	▽	▽	○	▽	○	○		○	○	○	○	▲	▲	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Denmark	514	(2.4)	▽	▽	▽	▽	▽	▽	○	▽	○	○	○		○	○	○	▲	▲	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Iceland	514	(2.3)	▽	▽	▽	▽	▽	▽	○	▽	○	○	○	○		○	○	▲	▲	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Liechtenstein	514	(7.0)	▽	▽	○	○	○	○	○	○	○	○	○	○	○		○	○	○	○	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Sweden	510	(2.5)	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○	○	○	○		○	○	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Ireland	503	(2.7)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○		○	○	○	▲	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Norway	499	(2.8)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○		○	○	○	○	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Czech Republic	498	(2.8)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	▽	○	○		○	○	○	○	▲	▲	▲	▲	▲	▲	▲	▲	▲
United States	493	(7.6)	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○	○	○	○	○	○	○	○		○	○	○	○	○	▲	▲	▲	▲	▲	▲	▲
Germany	490	(2.5)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○		○	○	▲	▲	▲	▲	▲	▲	▲	▲	▲
Hungary	488	(4.0)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○	○	○		○	○	○	▲	▲	▲	▲	▲	▲	▲
Russian Fed.	478	(5.5)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○	○		○	○	○	▲	▲	▲	▲	▲	▲
Spain	476	(3.1)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	▽	○	○		○	○	▲	▲	▲	▲	▲	▲
Poland	470	(5.5)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	▽	○	○	○		○	○	○	○	▲	▲	▲
Latvia	463	(4.5)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○		○	○	○	▲	▲	▲
Italy	457	(2.9)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○		○	○	▲	▲	▲
Portugal	454	(4.1)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○		○	○	▲	▲
Greece	447	(5.6)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○	○	○		○	▲	▲
Luxembourg	446	(2.0)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	○	○		▲	▲
Mexico	387	(3.4)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽		▲
Brazil	334	(3.7)	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	
Upper rank*			1	2	4	4	4	5	4	6	9	10	10	10	11	9	13	16	17	17	16	20	20	21	23	23	25	26	26	27	29	31	32
Lower rank*			3	3	8	7	9	8	10	10	15	15	16	16	16	18	17	19	20	20	23	22	23	25	25	26	28	28	29	30	30	31	32

**Note*: 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 per cent likelihood.

Instructions

Read across the row for a country to compare performance with the countries listed along the top of the chart. The symbols indicate whether the mean performance of the country in the row is significantly lower than that of the comparison country, significantly higher than that of the comparison country, or if there is no statistically significant difference between the mean performance of the two countries.

Note: Countries are presented in descending order of mean performance on the PISA mathematical literacy scale. Due to low response rates, the Netherlands is excluded from the figure. Assuming negligible to moderate levels of bias due to non-response, the position of the Netherlands may be expected, with 95 per cent confidence, to lie between 1st and 4th place among countries.

▲ Mean performance statistically significantly higher than in comparison country.

○ No statistically significant difference from comparison country.

▽ Mean performance statistically significantly lower than in comparison country.

Statistically significantly above the OECD average

Not statistically significantly different from the OECD average

Statistically significantly below the OECD average

Source: OECD PISA database, 2001. *See Annex 3* for notes on methodology *(www.oecd.org/els/education/eag2002)* and *www.pisa.oecd.org.*

Policy context

Mathematics and science today need to be used by the many, not just the few…

The need to provide the foundations for the professional training of a small number of mathematicians, scientists and engineers dominated the content of school mathematics and science curricula for much of the past century. With the growing role of science, mathematics and technology in modern life, however, the objectives of personal fulfilment, employment, and full participation in society increasingly require all adults to be mathematically, scientifically and technologically literate.

…if people are to understand and participate in the modern world.

Deficiencies in mathematical and scientific literacy can have grave consequences not only on the labour market and earnings prospects of individuals but also on the competitiveness of nations. Conversely, the performance of a country's best students in mathematics and science-related subjects can have implications for the part that country will play in tomorrow's advanced technology sector. Aside from workplace requirements, mathematical and scientific literacy also are important for understanding the environmental, medical, economic and other issues that confront modern societies and that rely heavily on technological and scientific advances.

This indicator shows the performance of 15-year-olds in mathematical and scientific literacy.

Consequently, policy-makers and educators alike attach great importance to mathematics and science education. Addressing the increasing demand for mathematical and scientific skills requires excellence throughout educational systems, and it is important to monitor how well nations provide young adults with fundamental skills in these areas. The Programme for International Student Assessment (PISA) provides information about how well 15-year-olds perform in these areas with a focus on assessing the knowledge and skills that prepare students for life and lifelong learning (Box A6.1).

Evidence and explanations

Charts A6.1 and A6.2 order countries by the mean performance of their students on the mathematical and scientific literacy scales. The charts also show which countries perform above, below, or about the same as the OECD average and how their students perform in comparison to students in every other country.

Box A6.1. What are mathematical and scientific literacy in PISA?

What is mathematical literacy? Mathematical literacy in PISA concerns students' ability to recognise and interpret mathematical problems encountered in their world, to translate these problems into a mathematical context, to use mathematical knowledge and procedures to solve the problems within their mathematical context, to interpret the results in terms of the original problem, to reflect upon the methods applied, and to formulate and communicate the outcomes.

What do different points along the mathematical literacy scale mean? The scale can be described in terms of the knowledge and skills students need to demonstrate at various points along the mathematical literacy scale.

- Towards the top end of the mathematical literacy scale, around 750 score points, students typically take a creative and active role in their approach to mathematical problems.
- Around 570 score points on the scale, students are typically able to interpret, link and integrate different representations of a problem or different pieces of information; and/or use and manipulate a given model, often involving algebra or other symbolic representations; and/or verify or check given propositions or models.
- At the lower end of the scale, around 380 score points, students are usually able to complete only a single processing step consisting of reproducing basic mathematical facts or processes or applying simple computational skills.

What is scientific literacy? Scientific literacy reflects students' ability to use scientific knowledge, to recognise scientific questions and to identify what is involved in scientific investigations, to relate scientific data to claims and conclusions, and to communicate these aspects of science.

What do different points along the scientific literacy scale mean? The scale can be described in terms of increasingly difficult tasks required for students:

- Towards the top end of the scientific literacy scale, around 690 score points, students generally are able to create or use simple conceptual models to make predictions or give explanations; analyse scientific investigations in relation to, for example, experimental design or the identification of an idea being tested; relate data as evidence to evaluate alternative viewpoints or different perspectives; and communicate scientific arguments and/or descriptions in detail and with precision.
- Around 550 score points, students typically are able to use scientific concepts to make predictions or provide explanations; recognise questions that can be answered by scientific investigation and/or identify details of what is involved in a scientific investigation; and select relevant information from competing data or chains of reasoning in drawing or evaluating conclusions.
- Towards the lower end of the scale, around 400 score points, reached by at least three-quarters of the students in almost all countries, students are able to recall simple scientific factual knowledge (*e.g.*, names, facts, terminology, simple rules); and use common science knowledge in drawing or evaluating conclusions.

Japan shows the highest mean score in mathematical literacy...

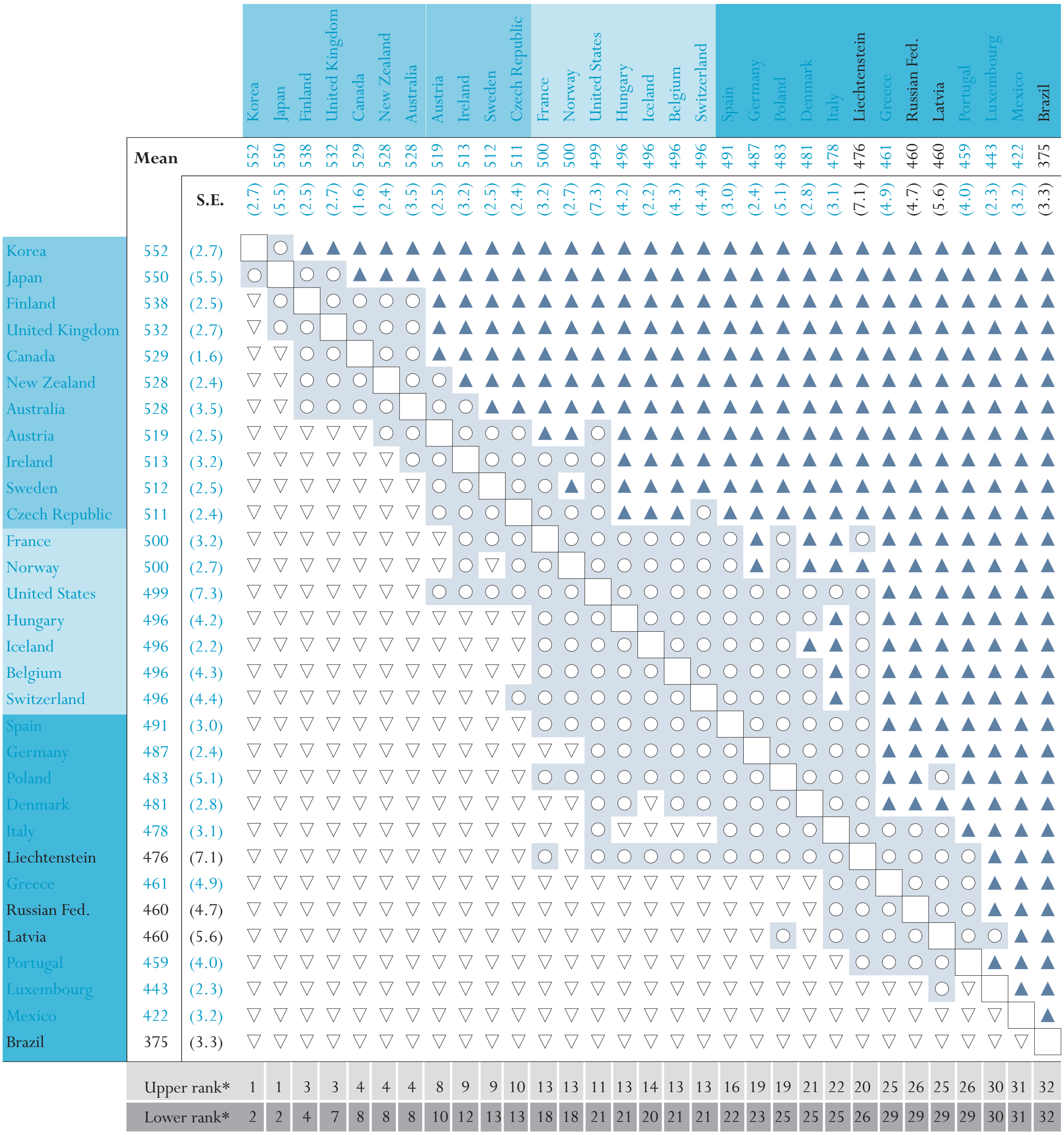
Students in Japan display the highest mean scores in mathematical literacy, although their scores cannot be distinguished statistically from students in three other top-performing countries: Korea, the Netherlands and New Zealand. Other countries that score significantly above the OECD average include Australia, Austria, Belgium, Canada, Denmark, Finland, France, Iceland, Liechtenstein, Sweden, Switzerland and the United Kingdom.

...and Korea in scientific literacy.

On the scientific literacy scale, students in Korea and Japan demonstrate the highest average performance compared to students in other OECD countries. Australia, Austria, Canada, Czech Republic, Finland, Ireland, New Zealand, Sweden and the United Kingdom are among other countries that score significantly above the OECD average.

Chart A6.2

Multiple comparisons of mean performance on the PISA scientific literacy scale (2000)



**Note*: 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 per cent likelihood.

Instructions

Read across the row for a country to compare performance with the countries listed along the top of the chart. The symbols indicate whether the mean performance of the country in the row is significantly lower than that of the comparison country, significantly higher than that of the comparison country, or if there is no statistically significant difference between the mean performance of the two countries.

Note: Countries are presented in descending order of mean performance on the PISA scientific literacy scale. Due to low response rates, the Netherlands is excluded from the figure. Assuming negligible to moderate levels of bias due to non-response, the position of the Netherlands may be expected, with 95 per cent confidence, to lie between 3rd and 14th place among countries.

▲ Mean performance statistically significantly higher than in comparison country.
○ No statistically significant difference from comparison country.
▽ Mean performance statistically significantly lower than in comparison country.

Statistically significantly above the OECD average
Not statistically significantly different from the OECD average
Statistically significantly below the OECD average

Source: OECD PISA database, 2001. *See Annex 3* for notes on methodology *(www.oecd.org/els/education/eag2002)* and *www.pisa.oecd.org.*

As can be inferred by reading the lists of above-average performers in the previous paragraphs, in general, countries that perform well in one subject area also perform well in the other subject area (*i.e.*, mean mathematics and science scores are highly correlated). However, there are some exceptions. For example, the scores for mathematical literacy of the Czech Republic and Ireland are not significantly different from the OECD average, but their students perform significantly above the OECD average on the scientific literacy scale. Conversely, students in Belgium, France, Iceland, and Switzerland perform significantly above the OECD average on the mathematical literacy scale, but their score in scientific literacy is not statistically different than the OECD average. Students in Denmark and Liechtenstein, while above the OECD mean in mathematical literacy, are below the OECD mean in scientific literacy.

While there are large differences in mean performance among countries, the variation of performance among students within each country is many times larger.

While there are large differences in mean performance among countries, the variation of performance among students within each country is many times larger. Tables A6.1 and A6.2 show how students perform at the 5th, 25th, 75th and 95th percentiles in each county. The distributions of student performance on the mathematical literacy scale in Belgium, Germany, Greece, Hungary, New Zealand, Poland, Switzerland and the United States show a relatively large gap between the 75th and 25th percentiles – between 135 and 149 score points. Finland, Iceland, Ireland, Japan and Korea show comparatively smaller disparities, with 113 score points or less separating the 75th and 25th percentiles.

In scientific literacy, Belgium, Denmark, France, Germany, Hungary, New Zealand, Switzerland and the United States exhibit relatively large gaps between students at the 75th and 25th percentiles – between 140 and 154 score points each – while Finland, Japan, Korea, and Mexico exhibit relatively small differences between these groups of students – with less than 118 score point differences.

Disparities in performance are not a necessary condition for a country to attain a high level of overall performance.

It is useful to relate the range of achievement with average performance. This comparison shows that wide disparities in student performance are not a necessary condition for a country to attain a high level of overall performance. On the contrary, it is striking to see that five of the countries with the smallest differences between the 75th and 25th percentiles on the mathematical literacy scale, namely Canada, Finland, Iceland, Japan and Korea, all perform significantly above the OECD average (Table A6.1). Furthermore, four of them, Canada, Finland, Japan and Korea are among the six best-performing countries in mathematical literacy. A similar pattern is observed for scientific literacy. Again, Canada, Finland, Japan and Korea are among the six countries with the smallest differences between 75th and 25th percentiles, as well as among the six best performing countries.

Conversely, the countries with the largest internal disparities tend to perform below the OECD mean. In mathematical literacy, for example, among the six countries (Belgium, Germany, Greece, Hungary, Poland and the United States) with the largest differences between the students at the 75th and 25th percentiles, only two (Belgium and the United States) do not perform significantly below the OECD average.

Definitions and methodologies

The achievement scores are based on assessments administered as part of the Programme for International Student Assessment (PISA) undertaken by the OECD during 2000.

The target population studied for this indicator was 15-year-old students. Operationally, this refers to students aged between 15 years and 3 (completed) months and 16 years and 2 (completed) months at the beginning of the testing period and enrolled in an educational institution, irrespective of the grade level or type of institutions in which they were enrolled and of whether they participated in school full-time or part-time.

To facilitate the interpretation of the scores assigned to students in PISA, the mean score for mathematical and scientific literacy performance across OECD countries was set at 500 and the standard deviation at 100, with the data weighted so that each OECD country contributed equally.

For notes on standard errors, significance tests, and multiple comparisons see Annex 3 at *www.oecd.org/els/education/eag2002*.

Table A6.1.

Variation in performance in mathematical literacy of 15-year-olds (2000)

Performance of 15-year-olds on the PISA mathematical literacy scale, by percentile

		Mean		Percentiles											
				5th		10th		25th		75th		90th		95th	
		Mean score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.
OECD COUNTRIES	Australia	533	(3.5)	380	(6.4)	418	(6.4)	474	(4.4)	594	(4.5)	647	(5.7)	679	(5.8)
	Austria	515	(2.5)	355	(5.3)	392	(4.6)	455	(3.5)	581	(3.8)	631	(3.6)	661	(5.2)
	Belgium	520	(3.9)	322	(11.0)	367	(8.6)	453	(6.5)	597	(3.0)	646	(3.9)	672	(3.5)
	Canada	533	(1.4)	390	(3.2)	423	(2.5)	477	(2.0)	592	(1.7)	640	(1.9)	668	(2.6)
	Czech Republic	498	(2.8)	335	(5.4)	372	(4.2)	433	(4.1)	564	(3.9)	623	(4.8)	655	(5.6)
	Denmark	514	(2.4)	366	(6.1)	401	(5.1)	458	(3.1)	575	(3.1)	621	(3.7)	649	(4.6)
	Finland	536	(2.2)	400	(6.5)	433	(3.6)	484	(4.1)	592	(2.5)	637	(3.2)	664	(3.5)
	France	517	(2.7)	364	(6.4)	399	(5.4)	457	(4.7)	581	(3.1)	629	(3.2)	656	(4.6)
	Germany	490	(2.5)	311	(7.9)	349	(6.9)	423	(3.9)	563	(2.7)	619	(3.6)	649	(3.9)
	Greece	447	(5.6)	260	(9.0)	303	(8.1)	375	(8.1)	524	(6.7)	586	(7.8)	617	(8.6)
	Hungary	488	(4.0)	327	(7.1)	360	(5.7)	419	(4.8)	558	(5.2)	615	(6.4)	648	(6.9)
	Iceland	514	(2.3)	372	(5.7)	407	(4.7)	459	(3.5)	572	(3.0)	622	(3.1)	649	(5.5)
	Ireland	503	(2.7)	357	(6.4)	394	(4.7)	449	(4.1)	561	(3.6)	606	(4.3)	630	(5.0)
	Italy	457	(2.9)	301	(8.4)	338	(5.5)	398	(3.5)	520	(3.5)	570	(4.4)	600	(6.1)
	Japan	557	(5.5)	402	(11.2)	440	(9.1)	504	(7.4)	617	(5.2)	662	(4.9)	688	(6.1)
	Korea	547	(2.8)	400	(6.1)	438	(5.0)	493	(4.2)	606	(3.4)	650	(4.3)	676	(5.3)
	Luxembourg	446	(2.0)	281	(7.4)	328	(4.2)	390	(3.8)	509	(3.4)	559	(3.2)	588	(3.9)
	Mexico	387	(3.4)	254	(5.5)	281	(3.6)	329	(4.1)	445	(5.2)	496	(5.6)	527	(6.6)
	New Zealand	537	(3.1)	364	(6.1)	405	(5.4)	472	(3.9)	607	(4.0)	659	(4.2)	689	(5.2)
	Norway	499	(2.8)	340	(7.0)	379	(5.2)	439	(4.0)	565	(3.9)	613	(4.5)	643	(4.5)
	Poland	470	(5.5)	296	(12.2)	335	(9.2)	402	(7.0)	542	(6.8)	599	(7.7)	632	(8.5)
	Portugal	454	(4.1)	297	(7.3)	332	(6.1)	392	(5.7)	520	(4.3)	570	(4.3)	596	(5.0)
	Spain	476	(3.1)	323	(5.8)	358	(4.3)	416	(5.3)	540	(4.0)	592	(3.9)	621	(3.1)
	Sweden	510	(2.5)	347	(5.8)	386	(4.0)	450	(3.3)	574	(2.6)	626	(3.3)	656	(5.5)
	Switzerland	529	(4.4)	353	(9.1)	398	(6.0)	466	(4.8)	601	(5.2)	653	(5.8)	682	(4.8)
	United Kingdom	529	(2.5)	374	(5.9)	412	(3.6)	470	(3.2)	592	(3.2)	646	(4.3)	676	(5.9)
	United States	493	(7.6)	327	(11.7)	361	(9.6)	427	(9.7)	562	(7.5)	620	(7.7)	652	(7.9)
	OECD total	***498***	***(2.1)***	***318***	***(3.1)***	***358***	***(3.4)***	***429***	***(3.0)***	***572***	***(2.1)***	***628***	***(1.9)***	***658***	***(2.1)***
	Country mean	***500***	***(0.7)***	***326***	***(1.5)***	***367***	***(1.4)***	***435***	***(1.1)***	***571***	***(0.8)***	***625***	***(0.9)***	***655***	***(1.1)***
NON-OECD COUNTRIES	Brazil	334	(3.7)	179	(5.5)	212	(5.2)	266	(4.2)	399	(5.5)	464	(7.5)	499	(8.9)
	Latvia	463	(4.5)	288	(9.0)	328	(8.9)	393	(5.7)	536	(6.2)	593	(5.6)	625	(6.6)
	Liechtenstein	514	(7.0)	343	(19.7)	380	(18.9)	454	(15.5)	579	(7.5)	635	(16.9)	665	(15.0)
	Russian Federation	478	(5.5)	305	(9.0)	343	(7.4)	407	(6.6)	552	(6.6)	613	(6.8)	648	(7.8)

Source: OECD PISA database, 2001. See Annex 3 for notes on methodology (*www.oecd.org/els/education/eag2002*) and *www.pisa.oecd.org*.

Table A6.2.
Variation in performance in scientific literacy of 15-year-olds (2000)
Performance of 15-year-olds on the PISA scientific literacy scale, by percentile

		Mean		Percentiles											
				5th		10th		25th		75th		90th		95th	
		Mean score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.
OECD COUNTRIES	Australia	528	(3.5)	368	(5.1)	402	(4.7)	463	(4.6)	596	(4.8)	646	(5.1)	675	(4.8)
	Austria	519	(2.6)	363	(5.7)	398	(4.0)	456	(3.8)	584	(3.5)	633	(4.1)	659	(4.3)
	Belgium	496	(4.3)	292	(13.5)	346	(10.2)	424	(6.6)	577	(3.5)	630	(2.6)	656	(3.0)
	Canada	529	(1.6)	380	(3.7)	412	(3.4)	469	(2.2)	592	(1.8)	641	(2.2)	670	(3.0)
	Czech Republic	511	(2.4)	355	(5.6)	389	(4.0)	449	(3.6)	577	(3.8)	632	(4.1)	663	(4.9)
	Denmark	481	(2.8)	310	(6.0)	347	(5.3)	410	(4.8)	554	(3.5)	613	(4.4)	645	(4.7)
	Finland	538	(2.5)	391	(5.2)	425	(4.2)	481	(3.5)	598	(3.0)	645	(4.3)	674	(4.3)
	France	500	(3.2)	329	(6.1)	363	(5.4)	429	(5.3)	575	(4.0)	631	(4.2)	663	(4.9)
	Germany	487	(2.4)	314	(9.5)	350	(6.0)	417	(4.9)	560	(3.3)	618	(3.5)	649	(4.7)
	Greece	461	(4.9)	300	(9.3)	334	(8.3)	393	(7.0)	530	(5.3)	585	(5.3)	616	(5.8)
	Hungary	496	(4.2)	328	(7.5)	361	(4.9)	423	(5.5)	570	(4.8)	629	(5.1)	659	(8.5)
	Iceland	496	(2.2)	351	(7.0)	381	(4.3)	436	(3.7)	558	(3.1)	607	(4.1)	635	(4.8)
	Ireland	513	(3.2)	361	(6.5)	394	(5.7)	450	(4.4)	578	(3.4)	630	(4.6)	661	(5.4)
	Italy	478	(3.1)	315	(7.1)	349	(6.2)	411	(4.4)	547	(3.5)	602	(4.0)	633	(4.4)
	Japan	550	(5.5)	391	(11.3)	430	(9.9)	495	(7.2)	612	(5.0)	659	(4.7)	688	(5.7)
	Korea	552	(2.7)	411	(5.3)	442	(5.3)	499	(4.0)	610	(3.4)	652	(3.9)	674	(5.7)
	Luxembourg	443	(2.3)	278	(7.2)	320	(6.8)	382	(3.4)	510	(2.8)	563	(4.4)	593	(4.0)
	Mexico	422	(3.2)	303	(4.8)	325	(4.6)	368	(3.1)	472	(4.7)	525	(5.5)	554	(7.0)
	New Zealand	528	(2.4)	357	(5.6)	392	(5.2)	459	(3.8)	600	(3.4)	653	(5.0)	683	(5.1)
	Norway	500	(2.8)	338	(7.3)	377	(6.6)	437	(4.0)	569	(3.5)	619	(3.9)	649	(6.2)
	Poland	483	(5.1)	326	(9.2)	359	(5.8)	415	(5.5)	553	(7.3)	610	(7.6)	639	(7.5)
	Portugal	459	(4.0)	317	(5.0)	343	(5.1)	397	(5.2)	521	(4.7)	575	(5.0)	604	(5.3)
	Spain	491	(3.0)	333	(5.1)	367	(4.3)	425	(4.4)	558	(3.5)	613	(3.9)	643	(5.5)
	Sweden	512	(2.5)	357	(5.7)	390	(4.6)	446	(4.1)	578	(3.0)	630	(3.4)	660	(4.5)
	Switzerland	496	(4.4)	332	(5.8)	366	(5.4)	427	(5.1)	567	(6.4)	626	(6.4)	656	(9.0)
	United Kingdom	532	(2.7)	366	(6.8)	401	(6.0)	466	(3.8)	602	(3.9)	656	(4.7)	687	(5.0)
	United States	499	(7.3)	330	(11.7)	368	(10.0)	430	(9.6)	571	(8.0)	628	(7.0)	658	(8.4)
	OECD total	*502*	*(2.0)*	*332*	*(3.3)*	*368*	*(3.1)*	*431*	*(2.8)*	*576*	*(2.1)*	*631*	*(1.9)*	*662*	*(2.3)*
	Country mean	*500*	*(0.7)*	*332*	*(1.5)*	*368*	*(1.0)*	*431*	*(1.0)*	*572*	*(0.8)*	*627*	*(0.8)*	*657*	*(1.2)*
NON-OECD COUNTRIES	Brazil	375	(3.3)	230	(5.5)	262	(5.9)	315	(3.7)	432	(4.9)	492	(7.8)	531	(8.2)
	Latvia	460	(5.6)	299	(10.1)	334	(8.8)	393	(7.7)	528	(5.7)	585	(7.2)	620	(8.0)
	Liechtenstein	476	(7.1)	314	(23.5)	357	(20.0)	409	(12.3)	543	(12.7)	595	(12.4)	629	(24.0)
	Russian Federation	460	(4.7)	298	(6.5)	333	(5.4)	392	(6.2)	529	(5.8)	591	(5.9)	625	(5.7)

Source: OECD PISA database, 2001. See Annex 3 for notes on methodology (*www.oecd.org/els/education/eag2002*) and *www.pisa.oecd.org*.

HOW STUDENT PERFORMANCE VARIES BETWEEN SCHOOLS

A7

- On average, differences in the performance of 15-year-olds between schools account for 36 per cent of the OECD average variation in student performance, but this proportion varies from 10 per cent in Finland and Sweden to more than 50 per cent in Austria, Belgium, the Czech Republic, Germany, Greece, Hungary, Italy and Poland.

- Some of the variation between schools is attributable to geography, institutional factors or the selection of students by ability. The differences are often compounded by family background, particularly in countries with differentiated school systems, since students' results are associated not only with their own individual backgrounds but – to a greater extent – with the backgrounds of others at their school.

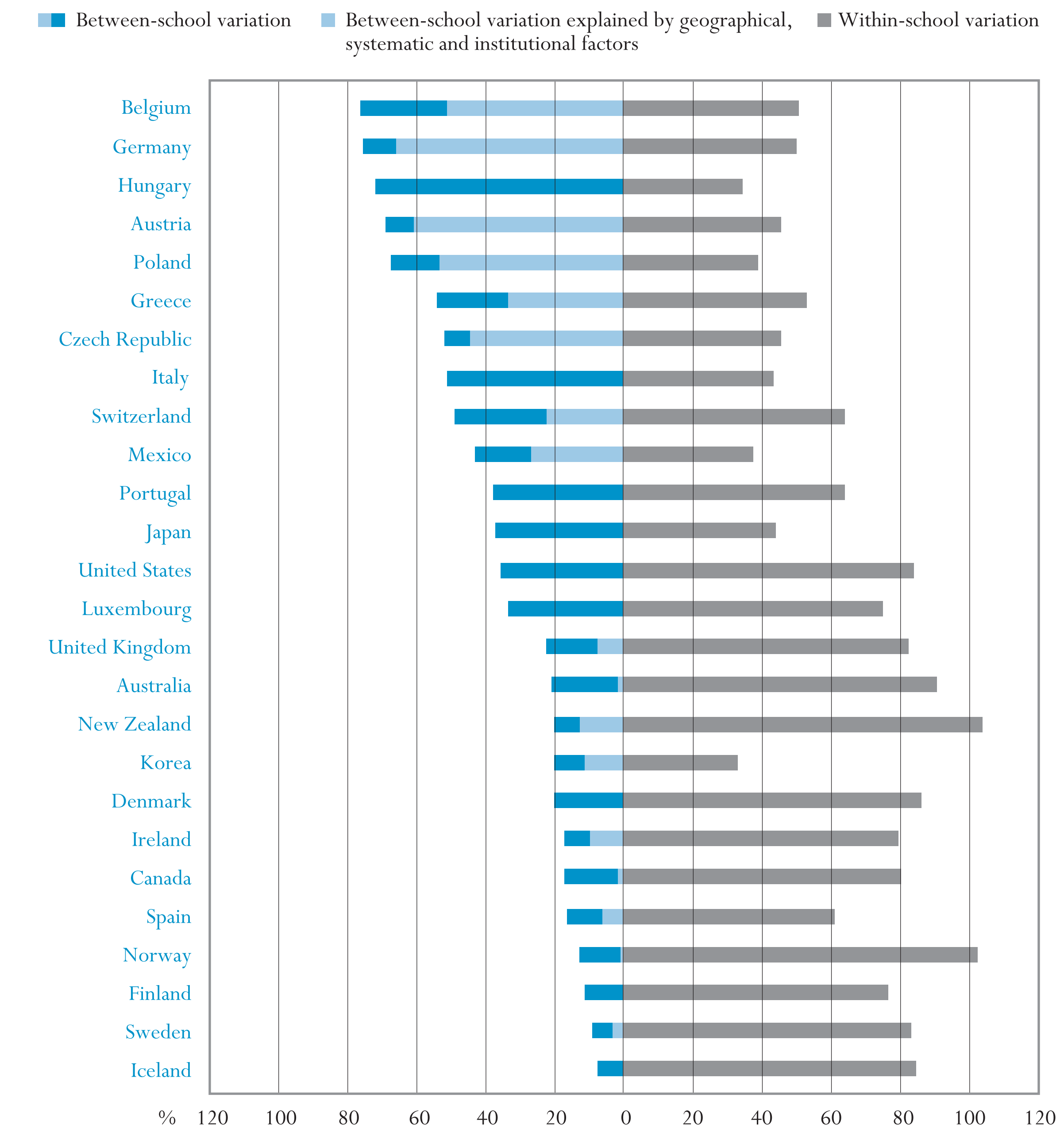
- High overall variation can result from high within-school differences, high between-school differences or a combination of the two.

- In school systems with differentiated school types, the clustering of students with particular socio-economic characteristics in certain schools is greater than in systems where the curriculum does not vary significantly between schools. In Austria, Belgium, the Czech Republic, Germany, Italy and the Netherlands, for example, the between-school variation associated with the fact that students attend different types of school is considerably compounded by differences in social and family background.

Chart A7.1.

Variation in student performance between schools and within schools on the PISA reading literacy scale (2000)

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



Countries are ranked in descending order of the total between-school variation in student performance on the PISA reading literacy scale.
Source: OECD PISA database, 2001. Table A7.1. See Annex 3 for notes on methodology *(www.oecd.org/els/education/eag2002)* and *www.pisa.oecd.org*.

A7

Policy context

Many factors account for the performance differences observed by PISA…

Indicators A5 and A6 have shown that, in most countries, there are considerable differences in performance within each education system. This variation may result from the background of students and schools, from the human and financial resources available to schools, from curricular differences, from selection policies and practices and from the way in which teaching is organised and delivered.

…and the organisation of the education system can play a significant part in this equation.

Some countries have non-selective school systems that seek to provide all students with the same opportunities for learning and that allow each school to cater to the full range of student performance. Other countries respond to diversity explicitly by forming groups of students of similar performance levels through selection either within or between schools, with the aim of serving students according to their specific needs. And in yet other countries, combinations of the two approaches occur. Even in comprehensive school systems, there may be significant variation between schools due to the socio-economic and cultural characteristics of the communities that the schools serve or due to geographical differences (such as differences between regions, provinces or states in federal systems, or differences between rural and urban areas). Finally, there may be significant variation between individual schools that cannot be easily quantified or otherwise described, part of which could result from differences in the quality or effectiveness of the teaching that those schools provide.

To shed light on this, this indicator examines performance differences between schools.

To examine the impact of such policies and practices, this indicator examines differences between schools in reading literacy performance. The results for mathematical and scientific literacy are broadly similar and therefore not shown in this indicator.

Evidence and explanations

Chart A7.1 compares the extent of variation in student performance within countries…

Chart A7.1 and Table A7.1 show the extent of variation attributable to different factors in each country. The length of the bars indicates the total observed variation in student performance on the reading literacy scale. Note that the values are expressed as percentages of the average variation between OECD countries in student performance on the reading literacy scale. If the sum of the two bars for each country is larger than 100, this indicates that variation in student performance is greater in the corresponding country than in a typical OECD country. Similarly, a combined value smaller than 100 indicates below-average variation in student performance.

…and breaks it down into between-school and within-school differences.

The bar for each country is aligned so that variation between schools is represented by the length to the left of the vertical line down the centre of the chart, and variation within schools is represented by the length to the right of that vertical line. Longer segments to the left of the vertical line indicate greater variation in the mean performance of schools. Longer segments to the right of the vertical line indicate greater variation among students within schools.

On average, differences between schools account for 36 per cent of the OECD average between-student variation, but this proportion varies widely across countries

As shown in Chart A7.1, in most countries a considerable portion of the variation in student performance lies between schools. On average, across the 26 OECD countries included in this comparison, differences between schools account for 36 per cent of the OECD average between-student variation. In Austria, Belgium, the Czech Republic, Germany, Greece, Hungary, Italy and Poland, more than 50 per cent of the OECD average between-student variation is between schools (see Column 3 in Table A7.1). Where there is substantial variation between schools and less variation between students within schools, students will generally be in schools in which other students perform at levels similar to their own. This selectivity may reflect family choice of school or residential location, or policies on school enrolment, allocation of students or the curriculum.

Some countries have low variation between schools and within schools…

In Korea, overall variation in student performance on the reading literacy scale is about half the OECD average variation, and Korea's variation between schools is only about 20 per cent of the OECD average variation between schools. Korea thus not only achieves high average performance in reading and low overall disparity between students, but does so with relatively little variation in mean performance between schools. Spain also shows low overall variation (around three-quarters of the OECD average) and low between-school variation (16 per cent of the OECD average variation in student performance) but, unlike Korea, has a mean score significantly below the OECD average.

…particularly those with the lowest overall variation.

The smallest variation in reading performance among schools occurs in Finland, Iceland and Sweden, where the differences account for only between 7 and 11 per cent of the average between-student variation in OECD countries. In these countries performance is largely unrelated to the schools in which students are enrolled. They are thus likely to encounter a similar learning environment in terms of the ability distribution of students. It is noteworthy that overall variation in student performance in these countries is below the OECD average. These education systems succeed both in minimising differences between schools and in containing the overall variation in student performance in reading literacy.

High overall variation can result from high within-school differences,…

Australia, New Zealand and Norway (with 112, 126 and 116 per cent of the OECD average between-student variation, respectively) are among the countries with the highest overall variation in reading performance, but only a comparatively small proportion (21, 20 and 13 per cent of the OECD average of student performance) results from differences between schools. In these countries, most variation occurs within schools, suggesting that individual schools need to cater to a more diverse client base.

…high between-school differences…

Belgium, Germany and Switzerland (124, 133 and 112 per cent of the average between-student variation in OECD countries) are also countries with comparatively high overall variation in student performance, but a large proportion (76, 75 and 49 per cent of the OECD average variation in student performance) results from differences in performance between schools.

…or a combination of the two.

The United States, another country with comparatively large overall variation in student performance (118 per cent of the average variation between students in OECD countries), is somewhere in the middle, with 35 per cent of the average OECD variation in student performance between schools.

Box A7.1. Factors associated with between-school variation in student performance

Many factors contribute to the variation in average student performance between schools. Some of these are as follows:

- **Sub-national differences:** In several countries school systems operate under sub-national jurisdictions (such as the communities in Belgium, the provinces and territories in Canada, the *Länder* in Germany or the states in Australia and the United States) or vary between a combination of cantons and linguistic communities (as in Switzerland).
- **Rural and urban areas:** Schooling and curricula often differ between urban and rural settings.
- **Publicly and privately managed schools:** In many countries, publicly and privately managed schools compete. In some countries, private schools usually have more selective enrolment policies. In addition, schools that are privately financed may hinder the participation of students from disadvantaged socio-economic backgrounds.
- **Programme type:** Some systems distinguish between types of school, which can differ substantially in the curriculum offered (*e.g.*, preparing students either for university education or for direct entry into the labour market). Even in systems in which differentiation occurs within schools, there may be distinct vocational and general tracks.
- **Level of education:** In a few countries, some 15-years-old students attend upper secondary schools while others attend lower secondary, depending either on their month of birth or on the promotion practices used, or as in the case of Switzerland, because of variation across cantons. In other countries, the same school may host more than one level of education. This means that the variation in student performance attributable to the difference in curriculum between lower and upper secondary education is included in the between-school variation in the former case, and in the within-school between-student variation in the latter.
- **Socio-economic intake:** The socio-economic characteristics of the communities served by schools often vary, although the size of this variation differs greatly between countries. The variation in school intake can affect the performance of the students enrolled.

Some of the variation between schools is attributable to geography, institutional factors or selection of students by ability…

Where does this variation in student performance on the reading literacy scale originate? The answer will vary between countries (see also Box A7.1). Many participating countries provided an indication of those geographical, systemic or institutional aspects of their education systems captured by PISA that they considered most likely to account for differences in performance between schools. The variation in student performance accounted for by these variables is indicated in Chart A7.1 in lighter shading on the left-hand side of the bar.

- In Australia, discounting differences between states and territories reduces the between-school variation in student performance from 21 to 19 per cent of the OECD average between-student variation.

- In Austria, discounting the differences between the various tracks to which students are allocated across six school types reduces the between-school variation from 68 to 8 per cent. In Belgium, discounting differences between the linguistic communities and between school type reduces the between-school variation from 76 to 25 per cent. Discounting differences between school and programme types reduces the between-school variation in Germany from 75 to 10 per cent, in Hungary from 71 to 19, in Poland from 67 to 14 and in Korea from 20 to 9 per cent over the OECD average between-student variation.

- Discounting differences between general and vocational schools, and between upper secondary and lower secondary programmes, reduces the between-school variation from 52 to 7 per cent in the Czech Republic, and in Greece from 54 to 21 per cent.

- In Ireland, discounting differences between school types, between regular schools and schools designated as educationally disadvantaged, and between rural and urban areas, reduces between-school variation from 17 to 7 per cent.

- Discounting level of education and programme type reduces the between-school variation in Italy (*Licei* versus vocational and technical schools) from 51 to 23 per cent, and in Mexico from 43 to 16 per cent.

- In Canada, discounting differences between provinces reduces between-school variation in student performance from 17 to 16 per cent.

- In Iceland, discounting school size and level of urbanisation reduces between-school variation from 7 to 6 per cent.

- In New Zealand, discounting school intake (including average socio-economic status and the proportion of Maori and Pacific students) reduces variation between schools from 20 to 7 per cent.

- Discounting immigrant students reduces variation between schools in Norway from 13 to 12 per cent and in Sweden from 9 to 6 per cent.

- In Spain, discounting differences between publicly and privately managed schools reduces between-school variation from 16 to 10 per cent.

- In Switzerland, discounting differences between programme types and levels of education, and between the linguistic communities in which schools are located, reduces the between-school variation from 49 to 27 per cent.

- In the United Kingdom, discounting differences between schools managed by local authorities versus other bodies such as self-governing trusts and church foundations, between co-educational and single-gender schools, and between regions, reduces the between-school variation from 22 to 15 per cent.

…which can be compounded by the bunching of socially privileged students, particularly in countries with different types of secondary schools…

Broadly, the data also suggest that, in school systems with differentiated school types, the clustering of students with particular socio-economic characteristics in certain schools is greater than in systems where the curriculum does not vary significantly between schools. In Austria, Belgium, the Czech Republic, Germany, Italy and the Netherlands, for example, the between-school variation associated with the fact that students attend different types of school is considerably compounded by differences in social and family background. This may be a consequence of selection or self-selection: when the school market provides some differentiation, students from lower social backgrounds may tend to be directed to, or choose for themselves, less demanding study programmes, or may opt not to participate in the selection procedures of the education system.

…since students' results are associated not only with their own individual backgrounds but – to a greater extent – with the backgrounds of others at their school.

The fuller analysis in the report *Knowledge and Skills for Life* (OECD, 2001) suggests that the overall social background of a school's intake on student performance tends to be greater than the impact of the individual student's social background. Students from a lower socio-economic background attending schools in which the average socio-economic background is high tend to perform much better than when they are enrolled in a school with a below-average socio-economic intake – and the reverse is true for more advantaged students in less advantaged schools. This suggests that institutional differentiation in education systems, often compounded by the social background of a school's intake, self-selection by students and/or their parents as well as judgements on prior achievement, can have a major impact on an individual student's success at school.

Definitions and methodologies

The achievement scores are based on assessments administered as part of the Programme for International Student Assessment (PISA) undertaken by the OECD during 2000.

The target population studied for this indicator was 15-year-old students. Operationally, this refers to students aged between 15 years and 3 (completed) months and 16 years and 2 (completed) months at the beginning of the testing period and enrolled in an educational institution, irrespective of the grade level or type of institutions in which they were enrolled and of whether they participated in school full-time or part-time.

To facilitate the interpretation of the scores assigned to students in PISA, the mean score for reading literacy performance across OECD countries was set at 500 and the standard deviation at 100, with the data weighted so that each OECD country contributed equally. These reference points anchor PISA's measurement of student proficiency.

Variation in Table A7.1 is expressed by statistical variance. This is obtained by squaring the standard deviation referred to earlier in this chapter. The statistical variance rather than the standard deviation is used for this comparison to allow for the decomposition of the components of variation in student performance. The average is calculated over the OECD countries included in the table. Owing to the sampling methods used in Japan, the between-school variation in Japan includes variation between classes within schools.

For notes on standard errors, significance tests, and multiple comparisons see Annex 3 at *www.oecd.org/els/education/eag2002*.

A7

Table A7.1.
Sources of variation in performance in reading literacy of 15-year-old students (2000)
Between-school and within-school variation in student performance on the PISA reading literacy scale

			Variation expressed as a percentage of the average variation in student performance (SP) across the OECD countries											
						Variation explained by the international socio-economic index of occupational status of students		Variation explained by the international socio-economic index of occupational status of students and schools		Variation explained by geographical/ systemic/ institutional factors		Variation explained by geographical/ systemic/institutional factors and the international socio-economic index of occupational status of students and schools		
		Total variation in SP[1]	Total variation in SP expressed as a percentage of the average variation in student performance across OECD countries	Total variation in SP between schools	Total variation in SP within schools	Between-school variation explained	Within-school variation explained	Between-school variation explained	Within-school variation explained	Between-school variation explained	Within-school variation explained	Between-school variation explained	Within-school variation explained	Total variation between schools expressed as a percentage of the total variation within the country[2]
OECD COUNTRIES	Australia	10 357	111.6	20.9	90.6	8.3	6.7	14.2	6.9	1.8	0.1	15.0	7.0	18.8
	Austria	8 649	93.2	68.6	45.7	10.4	0.4	42.6	0.3	60.4	0.0	61.6	0.5	60.0
	Belgium	11 455	123.5	76.0	50.9	11.0	1.8	44.2	1.9	50.7	0.0	61.9	1.9	59.9
	Canada	8 955	96.5	17.1	80.1	4.6	5.0	7.8	5.1	1.1	0.0	8.4	5.1	17.6
	Czech Republic	9 278	100.0	51.9	45.3	8.8	1.8	34.4	1.8	44.5	0.0	46.8	1.8	53.4
	Denmark	9 614	103.6	19.6	85.9	10.2	8.0	11.6	8.1	m	m	m	m	18.6
	Finland	7 994	86.2	10.7	76.5	1.5	4.6	1.7	4.6	m	m	m	m	12.3
	France	m	m	m	m	m	m	m	m	m	m	m	m	m
	Germany	12 368	133.3	74.8	50.2	11.7	2.3	51.5	2.3	65.2	0.0	66.9	2.3	59.8
	Greece	9 436	101.7	53.8	52.9	7.0	1.1	25.0	1.1	33.3	0.0	40.1	0.4	50.4
	Hungary	8 810	95.0	71.2	34.8	8.3	0.3	49.4	0.2	52.5	0.0	58.7	0.1	67.2
	Iceland	8 529	91.9	7.0	85.0	1.6	5.0	1.7	5.0	0.9	0.0	2.3	5.0	7.6
	Ireland	8 755	94.4	17.1	79.2	5.5	5.7	10.1	5.7	9.7	0.0	12.7	5.5	17.8
	Italy	8 356	90.1	50.9	43.4	3.4	0.5	23.8	0.5	27.6	0.0	30.1	0.5	54.0
	Japan[3]	7 358	79.3	36.5	43.9	m	m	m	m	m	m	m	m	45.4
	Korea	4 833	52.1	19.7	33.0	1.0	0.2	7.1	0.2	10.9	0.0	12.0	0.2	37.4
	Luxembourg	10 088	108.7	33.4	74.9	11.1	8.3	26.7	8.2	m	m	m	m	30.8
	Mexico	7 370	79.4	42.9	37.4	5.2	0.1	25.7	0.1	26.5	0.0	35.3	0.1	53.4
	New Zealand	11 701	126.1	20.1	103.9	7.3	10.9	11.6	11.0	12.9	0.0	14.8	11.0	16.2
	Norway	10 743	115.8	12.6	102.4	3.7	8.7	4.9	8.7	0.5	3.8	5.2	10.1	10.9
	Poland	9 958	107.3	67.0	38.9	6.3	1.1	42.4	1.1	53.0	0.0	55.9	1.1	63.2
	Portugal	9 436	101.7	37.5	64.3	10.6	4.6	23.8	4.6	m	m	m	m	36.8
	Spain	7 181	77.4	15.9	60.9	5.4	3.0	9.1	3.1	6.2	0.0	10.9	3.1	20.7
	Sweden	8 495	91.6	8.9	83.0	4.5	6.9	5.8	6.9	2.7	2.6	6.9	8.1	9.7
	Switzerland	10 408	112.2	48.7	63.7	12.7	4.0	24.3	3.9	22.1	0.0	29.7	4.1	43.4
	United Kingdom	10 098	108.9	22.4	82.3	9.6	8.4	16.0	8.7	7.3	0.0	17.1	6.7	21.4
	United States	10 979	118.3	35.1	83.6	12.0	5.6	25.5	5.8	m	m	m	m	29.6
NON-OECD COUNTRIES	Brazil	7 427	80.1	35.8	47.1	6.5	1.9	19.7	2.1	5.3	0.0	21.7	2.1	43.1
	Latvia	10 435	112.5	35.1	77.5	4.9	4.4	16.7	4.5	m	m	m	m	31.2
	Liechtenstein	m	m	m	m	m	m	m	m	m	m	m	m	43.9
	Russian Federation	8 466	91.3	33.6	57.1	4.8	2.4	15.4	2.3	16.6	0.0	21.0	2.3	37.1

1. The total variation in student performance is obtained as the square of the standard deviation shown in Table A5.2. 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. For reasons explained in the *PISA 2000 Technical Report*, the sum of the between and within-school variance components may, for some countries, differ slightly from the square of the standard deviation shown in Table A5.2.
2. This index is often referred to as the intra-class correlation (rho).
3. Due to the sampling methods used in Japan, the between-school variance in Japan includes variation between classes within schools.
Source: OECD PISA database, 2001. See Annex 3 for notes on methodology (*www.oecd.org/els/education/eag2002*) and *www.pisa.oecd.org*.

CIVIC KNOWLEDGE AND ENGAGEMENT

- Within the frame of reference of the IEA Civic Education Study, 14-year-olds in most OECD countries typically demonstrate a solid understanding of fundamental democratic values and institutions and skills in interpreting civic-related material such as political cartoons or a mock election leaflet and in distinguishing between statements of opinion and of fact.

- 14-year-olds generally view obeying the law and voting as very important adult responsibilities and also value activities that promote human rights, protect the environment and benefit the community. They value engaging in political discussions or joining a political party less.

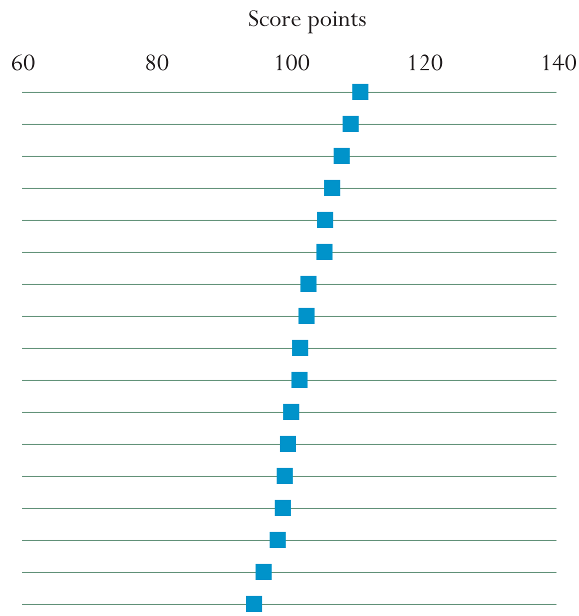
Chart A8.1.

Civic knowledge of 14-year-olds (1999)

Mean score and significance of the mean score compared to the international mean on the IEA Civic Education sub-scales of content knowledge and interpretative skills, and the IEA Civic Education total civic score

■ Mean scale score statistically significantly higher than the country mean[4]
■ No statistically significant difference from the country mean[4]
■ Mean scale score statistically significantly lower than the country mean[4]

Country	Mean scale score: Content knowledge	Mean scale score: Interpretative skills	Mean scale score: Total civic score
Poland	112 (1.3)	106 (1.7)	111 (1.7)
Finland	108 (0.7)	110 (0.6)	109 (0.7)
Greece	109 (0.7)	105 (0.7)	108 (0.8)
United States[1]	102 (1.1)	114 (1.0)	106 (1.2)
Italy	105 (0.8)	105 (0.7)	105 (0.8)
Slovak Republic	107 (0.7)	103 (0.7)	105 (0.7)
Norway[2]	103 (0.5)	103 (0.4)	103 (0.5)
Czech Republic	103 (0.8)	102 (0.8)	103 (0.8)
Australia	99 (0.7)	107 (0.8)	102 (0.8)
Hungary	102 (0.6)	101 (0.7)	102 (0.6)
Denmark[2]	100 (0.5)	100 (0.5)	100 (0.5)
Germany[3]	99 (0.5)	101 (0.5)	100 (0.5)
England[1]	96 (0.6)	105 (0.7)	99 (0.6)
Sweden[1]	97 (0.8)	102 (0.7)	99 (0.8)
Switzerland	96 (0.8)	102 (0.8)	98 (0.8)
Portugal	97 (0.7)	95 (0.7)	96 (0.7)
Belgium (Fr.)[2]	94 (0.9)	96 (0.9)	95 (0.9)



1. Date of testing at beginning of school year.
2. Countries' overall participation rate after replacement is less than 85 per cent.
3. Does not cover all of the national population.

Countries are ranked in descending order of the mean scale score on the total IEA Civic Education total civic knowledge scale.
Source: IEA Civic Education Study (2001).

A8

Policy context

Democratic societies rely not just on a solid foundation of knowledge and skills in subject matter areas such as reading, mathematics and science, but also on the continual preparation of informed citizens who have the knowledge and skills to understand basic forms of political communication. They also rely on individuals who will be engaged in participation as citizens.

This indicator shows 14-year-olds' knowledge of civic-related content, their skills in understanding political communication and their attitudes towards government.

How can schools nurture young people's knowledge of, and engagement in, the civil society and the governmental sphere. To ascertain what students in different countries understand and believe about citizenship, government, and the law, the International Association for the Evaluation of Educational Achievement (IEA) Civic Education Study was designed to identify and examine the ways in which young people are prepared to undertake their role as citizens in democracies, both inside and outside the school. In this study, 14-year-olds in 28 countries, including 17 OECD countries, were tested on their knowledge of civic-related content, their skills in understanding political communication, their concepts and attitudes towards civic issues, and their participation or practice in this area.

Evidence and explanations

Civic knowledge and skills

The IEA Civic Education Study distinguishes between content knowledge and interpretative skills when comparing civic knowledge across countries.

Chart A8.1 shows the mean Civic Knowledge scores of 14-year-olds. The total score is composed of two subscores, entitled "content knowledge" (knowledge of fundamental democratic principles) and "interpretative skills" (skills in interpreting civic-related information, such as political cartoons, election leaflets or newspaper articles). The total scale as well as the two subscales were adjusted to have a mean of 100 and a standard deviation of 20 across all 28 countries participating in the IEA Civic Education study.

The results suggest that the average 14-year-old in most OECD countries has a solid understanding of fundamental democratic values and institutions…

The results suggest that the average student across the participating countries has a solid understanding of fundamental democratic values and institution, within the frame of reference that was established for this by the IEA Civic Education Study. The test results indicate that internationally a majority of students recognise essential functions of laws, private civil society associations and political parties (out of the 38 questions used in the test, 25 were answered correctly by at least 60 per cent of the combined student population across participating countries and 13 questions by more than 70 per cent).

…as well as a substantial level of skills in interpreting civic-related material such as political cartoons or a mock election leaflet and in distinguishing between statements of opinion and of fact.

The average student demonstrated a substantial level of skills in interpreting civic-related material such as political cartoons or a mock election leaflet and in distinguishing between statements of opinion and of fact. Among 14-year-olds, high average skills in interpreting civic and political information are found *primarily* in countries where democracy has been the form of government for more than 40 years. Australia, England, Greece, Finland, Italy, Norway, Poland, the Slovak Republic, Sweden, and the United States all scored above the international mean in the IEA Civic Education Study's sub-scale on Interpretative Skills.

There are no simple explanations for the differences among countries in civic content knowledge and interpretative skills. The high performing countries include not only long standing democracies but also nations that have experienced massive political transitions during the lifetimes of the 14-year-olds that were assessed (*e.g.*, the Czech Republic, Poland and the Slovak Republic). The Czech Republic, Greece, Finland, Hungary, Italy, Norway, Poland and the Slovak Republic all scored above the country mean (which includes all participating countries, not just those that are members of the OECD) in the IEA Civic Education Study's sub-scale on Content Knowledge.

There are wide differences among countries for which there are no simple explanations…

Comparing performance on the two subscales shows some interesting patterns. Students in Australia, England, Sweden, Switzerland and the United States ranked higher in their performance on the items measuring skills in understanding civic-related information than on the items measuring content knowledge of fundamental democratic principles. By contrast, students in the Czech Republic and Hungary ranked higher on the items measuring content knowledge than on the items assessing interpretative skills.

…but some may mirror differences in curricular emphases.

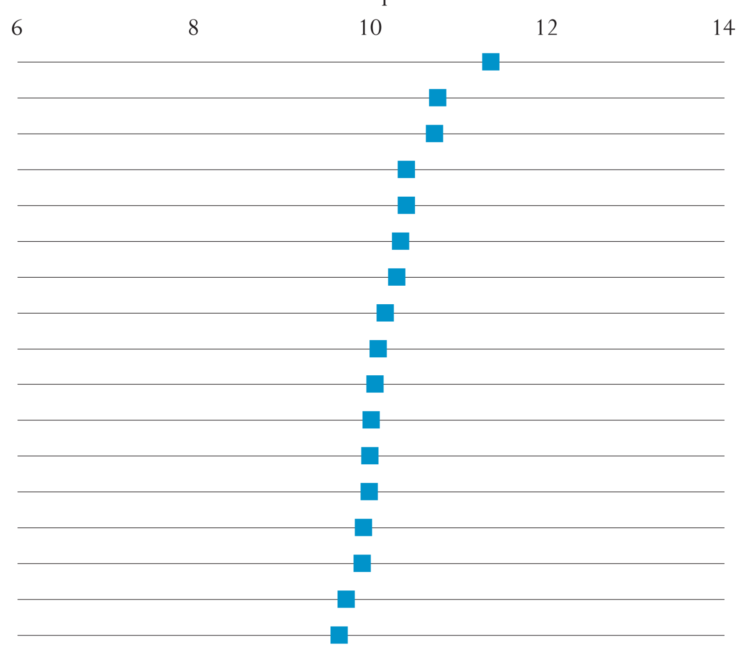
Chart A8.2.

Trust in government-related institutions of 14-year-olds (1999)

Mean score and significance of the mean score compared to the country mean on the IEA Civic Education scale of trust in government-related institutions

- Mean scale score statistically significantly higher than the country mean[4]
- No statistically significant difference from the country mean[4]
- Mean scale score statistically significantly lower than the country mean[4]

Country	Mean scale score
Denmark[1]	11.4 (0.04)
Norway[1]	10.8 (0.04)
Switzerland	10.7 (0.04)
Greece	10.4 (0.05)
United States[2]	10.4 (0.07)
Australia	10.3 (0.06)
Slovak Republic	10.3 (0.05)
Sweden[2]	10.2 (0.06)
Finland	10.1 (0.05)
Hungary	10.1 (0.05)
Italy	10.1 (0.03)
England[2]	10.0 (0.04)
Germany[3]	10.0 (0.04)
Belgium (Fr.)[1]	9.9 (0.07)
Poland	9.9 (0.05)
Czech Republic	9.7 (0.05)
Portugal	9.6 (0.04)



1. Countries' overall participation rate after replacement is less than 85 per cent.
2. Date of testing at beginning of school year.
3. Does not cover all of the national population.
Countries are ranked in descending order of the country mean on the IEA Civic Education scale of trust in government-related institutions.

A8

Patterns of trust in government and civic engagement

Students were also asked about their trust in government and what they believe is important for adults to be good citizens.

In the Civic Education Study, students were also asked to what extent certain types of government institutions – national government, local council or government in the town or city in which the student lives, courts, the police, political parties and National Parliament – can be trusted. Chart A8.2 shows the results, with a scale that has a mean of 10 and a standard deviation of 2 across all 28 countries participating in the IEA Civic Education Study. Australia, Denmark, Greece, Norway, the Slovak Republic, Switzerland, and the United States all scored above the international mean, the Czech Republic and Portugal below it. A number of countries with low trust scores were non-OECD countries, which are not included in the chart.

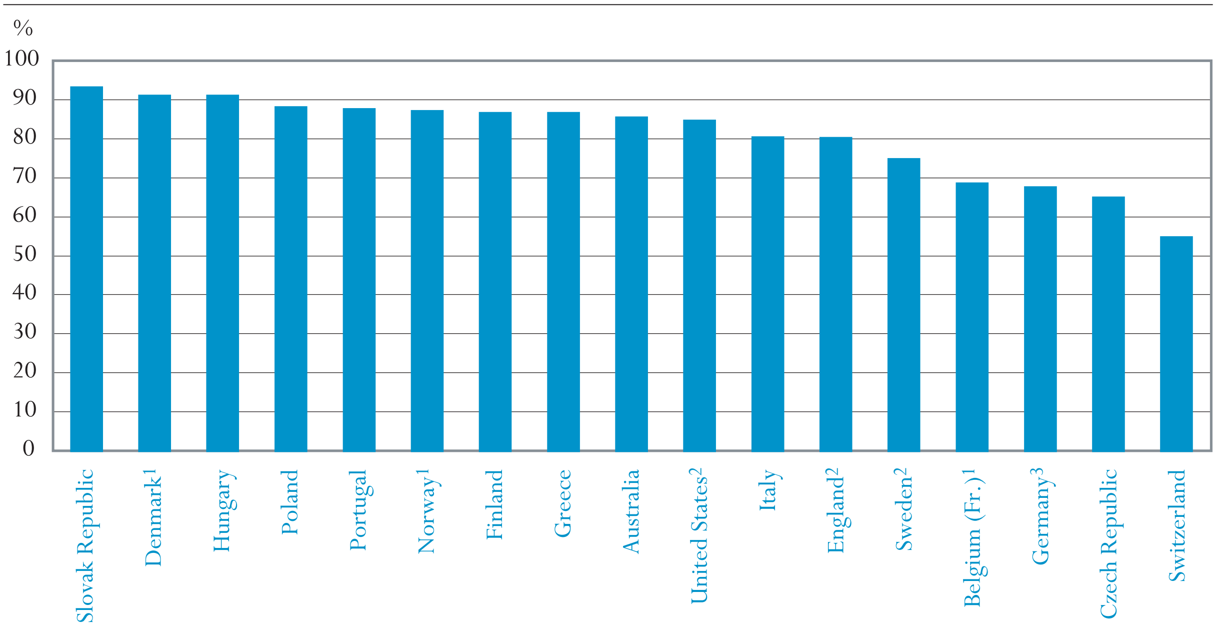
14-year-olds generally view obeying the law and voting as very important adult responsibilities.

Students were also asked questions assessing what they believe is important for adults to do as good citizens. Table A8.1 shows selected responses (for other items see *Citizenship and Education in Twenty-Eight Countries,* IEA 2001). 14-year-olds generally view obeying the law as a very important responsibility of adult citizenship and voting as important.

Chart A8.3.

Likelihood of voting of 14-year-olds (1999)

Percentage of 14-year-olds who say that they are very likely or likely to vote in national elections



1. Countries' overall participation rate after replacement is less than 85 per cent.
2. Date of testing at beginning of school year.
3. National Desired Population does not cover all International Desired Population.

Countries are ranked in descending order of the percentage of 14-year-old students who say that they are very likely or likely to vote in national elections.

Source: IEA Civic Education Study (2001). Table A8.1.

They also believe that the responsibilities of adult citizens include taking part in activities that promote human rights, protect the environment and benefit the community. In some countries, following political issues in the media is also considered important.

They also highly rate activities that promote human rights, protect the environment and benefit the community but far less so engaging in political discussions or joining a political party.

Finally, students were asked to estimate the kinds of political participation they expected to undertake as adults. Only about 20 per cent of the respondents across countries said that they intended to participate in those activities usually associated with conventional adult political involvement, for example joining a political party, writing to newspapers about social and political concerns, or being a candidate for a local or city-wide office. Substantial proportions of 14-year-olds say, however, that they expect that they will vote and think that it is important for adult citizens to vote. In some countries this is considerably higher than the proportion of young adults who actually vote (see Chart A8.3).

Definitions and methodologies

This indicator was derived from the International Association for the Evaluation of Educational Achievement's (IEA) Civic Education Study, which tested nationally representative samples of 90 000 students from 28 countries in 1999. The target population is defined as the students enrolled in the grade level in which the majority of 14-year-olds are enrolled (8th or 9th grade). In a survey portion of the IEA instrument students were asked to indicate how likely they were to vote and how important they believed it was for good adult citizens to engage in a number of political and civic activities. Those percentages are presented along with standard errors appropriate to the sampling method.

This indicator is based on the IEA Civic Education Study for which data were collected by the IEA in 1999.

For further information see *Citizenship and Education across Countries: Civic Knowledge and Engagement at Age Fourteen* (Torney-Purta, Lehmann, Oswald, and Schulz, published by IEA Amsterdam).

Table A8.1.

Civic attitudes and civic engagement of 14-year-olds (1999)

Percentage of students who say that they are very likely or likely to vote in national elections and percentage of students who believe that it is very important or important that a good citizen participates in selected civic activities

	Percentage of students who say that they are very likely or likely to vote in national elections		Percentage of students who believe that it is very important or important that a good citizen ... votes in every election		joins a political party		engages in political discussions		participates in activities to benefit people in the community		takes part in activities to protect the environment	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
OECD COUNTRIES												
Australia	85	(1.0)	89	(0.8)	17	(1.0)	34	(1.1)	80	(1.0)	74	(1.1)
Belgium (Fr.)[1]	69	(2.0)	82	(1.4)	24	(1.0)	39	(1.4)	54	(2.0)	71	(1.7)
Czech Republic	65	(1.7)	66	(1.1)	18	(1.0)	29	(1.4)	78	(0.9)	84	(1.0)
Denmark[1]	91	(0.7)	60	(1.0)	17	(0.8)	44	(0.9)	86	(0.8)	83	(0.7)
England[2]	80	(1.0)	76	(1.1)	20	(0.9)	42	(1.3)	78	(1.0)	76	(1.1)
Finland	87	(0.7)	59	(1.2)	13	(0.8)	23	(1.1)	60	(1.0)	74	(1.0)
Germany[3]	67	(1.1)	69	(0.9)	18	(0.7)	43	(1.2)	85	(0.9)	72	(1.2)
Greece	86	(0.9)	94	(0.6)	49	(1.0)	59	(1.0)	90	(0.7)	89	(0.7)
Hungary	91	(0.7)	81	(0.9)	29	(0.9)	21	(0.8)	89	(0.6)	77	(1.0)
Italy	80	(1.1)	84	(0.7)	32	(1.0)	49	(1.0)	82	(0.7)	79	(0.8)
Norway[1]	87	(0.7)	71	(0.9)	21	(0.8)	37	(1.0)	83	(0.8)	91	(0.6)
Poland	88	(1.2)	91	(0.8)	35	(1.2)	53	(1.4)	90	(0.8)	77	(0.8)
Portugal	88	(0.8)	71	(0.9)	36	(1.1)	40	(1.0)	94	(0.6)	92	(0.6)
Slovak Republic	93	(0.6)	91	(0.7)	23	(1.3)	51	(1.0)	87	(0.8)	87	(0.8)
Sweden[2]	75	(1.4)	78	(1.0)	21	(0.9)	37	(1.5)	83	(1.2)	81	(1.3)
Switzerland	55	(1.3)	68	(1.2)	23	(1.1)	42	(1.2)	76	(0.9)	70	(1.2)
United States[2]	85	(1.0)	83	(0.9)	48	(1.4)	58	(1.1)	88	(0.8)	83	(0.8)

1. Countries' overall participation rate after replacement is less than 85 per cent.
2. National Desired Population does not cover all International Desired Population.
3. Countries with testing date at beginning of school year.
Source: IEA Civic Education Study (2001).

OCCUPATIONAL STATUS OF PARENTS AND STUDENT PERFORMANCE

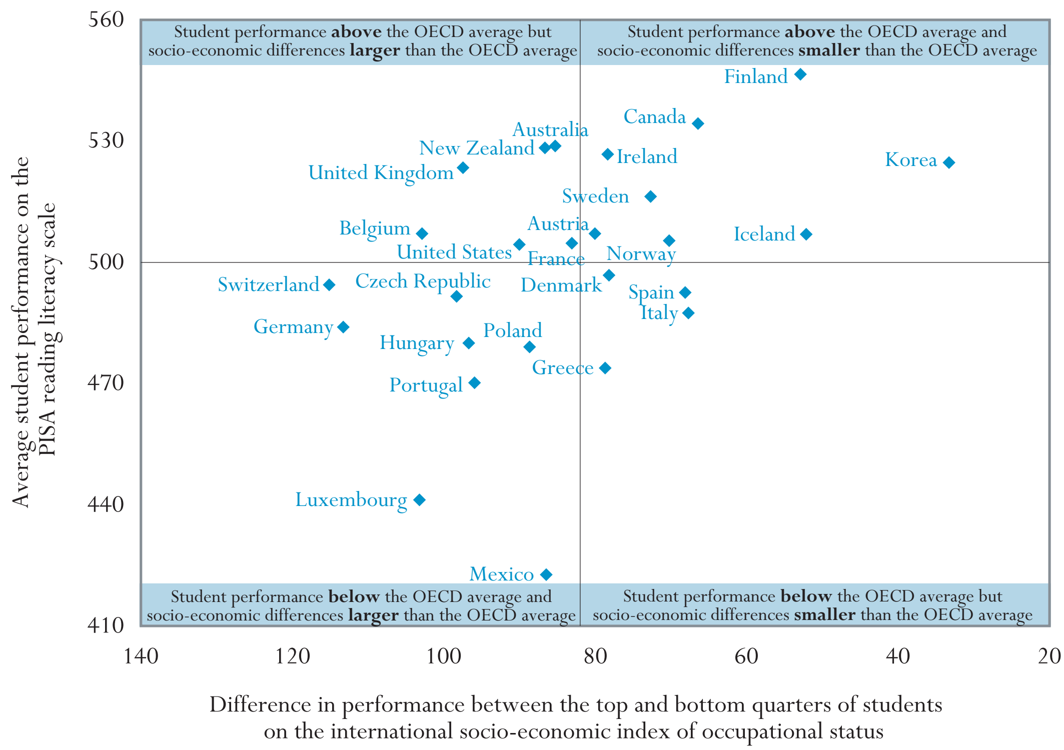
- 15-year-olds whose parents have higher-status jobs show higher literacy performance on average but the advantage is much greater in some countries than in others, particularly in Belgium, Germany, Luxembourg and Switzerland.

- While socio-economic background remains one of the most powerful factors influencing performance, some countries demonstrate that high average quality and social equity in educational outcomes can go together.

Chart A9.1.

Student performance and equity (2000)

Relationship between average student performance on the PISA reading literacy scale and difference in student performance between the top and bottom quarters of students on the international socio-economic index of occupational status



Source: OECD PISA database, 2001. Table A9.1. See Annex 3 for notes on methodology *(www.oecd.org/els/education/eag2002)* and *www.pisa.oecd.org.*

Policy context

Schools need to cater to children from all backgrounds…

Students come from a variety of family, socio-economic and cultural backgrounds. As a result, schools need to provide appropriate and equitable opportunities for a diverse student body. The learning environment can be enhanced by the variety of students' backgrounds and interests. However, heterogeneous levels of ability and differences in school preparedness increase the challenges that schools face in meeting the needs of students from widely varying socio-economic backgrounds.

…and looking at links between background and performance can help educators to do so more effectively.

Identifying the characteristics of the students most likely to perform poorly can help educators and policy-makers to locate areas for policy intervention. Similarly, identifying the characteristics of students who may flourish academically can assist policy-makers to promote high levels of performance. If it can be shown that some countries find it easier than others to accommodate both groups, this would suggest that it is feasible to foster equity and high performance simultaneously.

To shed light on this, this indicator examines the relationship between 15-year-olds' performance and socio-economic background.

To pursue this question, this indicator examines the relationship between students' performance in reading literacy and one important aspect of their home backgrounds, namely their parents' level of occupational status. The relationship between mathematical and scientific literacy and socio-economic background is similar and therefore not shown in this indicator.

Evidence and explanations

Parental occupation is a measure of socio-economic status and can influence students' aspirations and attitudes.

Higher parental occupational status can influence students' occupational aspirations and expectations and, in turn, their commitment to learning as the means of satisfying those aspirations. High parental occupational status can also increase the range of options of which children are aware. PISA captures this aspect of students' home backgrounds through information on parents' occupations and the activities associated with those occupations in a way that is internationally comparable. The resulting *socio-economic index of occupational status*, which has values ranging from 0 to 90, measures the attributes of occupation that convert a person's education into income. As the required skills increase, so also does the status of the occupation. Therefore, the higher the value on the index, the higher the occupational status of a student's parents. On average across OECD countries, the value of the index is 49 and its standard deviation is 16. Typical occupations among parents of 15-year-olds with between 16 and 35 points on the index include small-scale farming, metalworking, motor mechanics, taxi and lorry-driving, and waiting. Between 35 and 53 index points, the most common occupations are book-keeping, sales, small business management and nursing. Between 54 and 70 index points, typical occupations are marketing management, teaching, civil engineering and accountancy. Finally, between 71 and 90 points, the top international quarter of the index, occupations include medicine, university teaching and law.

Students whose parents have higher-status jobs show higher literacy performance on average…

As can be seen in Table A9.1, differences in the socio-economic index of occupational status are associated with large differences in reading literacy performance within countries. For those students in the top national quarters of students on the socio-economic index, the mean score of OECD countries on the reading literacy scale is 545 points, or 45 points about the OECD average for all students. By contrast, the average score among the bottom national quarters of students on the socio-economic index is only 463 points. The average gap between the two groups is more than the magnitude of an entire proficiency level in reading.

…but in some countries the advantage is much greater than in others.

The largest differences, of 100 points or more, are found in Belgium, Germany, Luxembourg and Switzerland. In Germany, the difference is particularly striking. Students whose parents have the highest status jobs (the top quarter on the occupational index) score on average about as well as the average student in Finland, the best-performing country in PISA; those whose parents have the lowest-status jobs score about the same as students in Mexico, the OECD country with the lowest performance.

While socio-economic background remains one of the most powerful factors influencing performance…

The Czech Republic, Hungary, the United Kingdom and the United States also have differences of more than 90 points for students in the top and bottom quarters of the socio-economic index, well above the equivalent of one proficiency level. As in Belgium, Germany and Switzerland, students in these countries who are in the bottom quarter of the occupational index are more than twice as likely as other students also to be among the bottom 25 per cent of their country's performers on the reading literacy scale.

Although PISA shows that poor performance in school does not automatically follow from a disadvantaged socio-economic background, this still appears to be one of the most powerful factors influencing performance on the PISA reading literacy scale. This represents a significant challenge for public policy, which strives to provide learning opportunities for all students irrespective of their home backgrounds. National research evidence from various countries has generally been discouraging. Schools have appeared to make little difference. Either because privileged families are better able to reinforce and enhance the effect of schools, or because schools are better able to nurture and develop young people from privileged backgrounds, it has often been apparent that schools reproduce existing patterns of privilege rather than delivering equal opportunities in a way that can distribute outcomes more equitably.

…some countries demonstrate that high average quality and social equity in educational outcomes can go together.

The international evidence of PISA is more encouraging. While all countries show a clear positive relationship between home background and educational outcomes, some countries demonstrate that high average quality and equality of educational outcomes can go together. Canada, Finland, Iceland, Korea and Sweden all display above-average levels of student performance on the reading literacy scale and, at the same time, below-average disparities between students from advantaged and disadvantaged socio-economic backgrounds (Chart A9.1).

Conversely, average performance in reading literacy in the Czech Republic, Germany, Hungary, Luxembourg, Poland and Portugal is significantly below the OECD average while, at the same time, there are above-average disparities between students from advantaged and disadvantaged socio-economic backgrounds.

It cannot be assumed, however, that all of these differences are a direct result of the home advantages and higher expectations conferred by parents in higher occupations. Many factors affect students' performance. For example, socio-economic status may be related to where students live and the quality of the schools to which they have access (this would be important in school systems that are dependent on local taxes), to the likelihood that they are enrolled in private schools, to the level of parental support and involvement, etc.

Definitions and methodologies

The achievement scores are based on assessments administered as part of the Programme for International Student Assessment (PISA) undertaken by the OECD during 2000.

The target population studied for this indicator was 15-year-old students. Operationally, this refers to students aged between 15 years and 3 (completed) months and 16 years and 2 (completed) months at the beginning of the testing period and enrolled in an educational institution, regardless of the grade level or type of institutions in which they were enrolled and of whether they participated in school full-time or part-time.

The PISA Socio-Economic Index of Occupational Status was derived from students' responses on parental occupation. The index captures the attributes of occupations that convert parents' education into income. The index was derived by the optimal scaling of occupation groups to maximise the indirect effect of education on income through occupation and to minimise the direct effect of education on income, net of occupation (both effects being net of age). The index is based on either the father's or mother's occupations, whichever is the higher. Values on the index range from 0 to 90; low values represent low socio-economic status and high values represent high socio-economic status. For more information on the methodology, see the *PISA 2000 Technical Report* (OECD, 2002).

For notes on standard errors and significance tests see Annex 3 at *www.oecd.org/els/education/eag2002*.

Table A9.1.

Student performance and socio-economic status (2000)

International socio-economic index of occupational status (ISEI) and performance on the PISA reading literacy scale, by national quarters of the index, based on students' self-reports

		International socio-economic index of occupational status										Performance on the PISA reading literacy scale, by national quarters of the international socio-economic index of occupational status[1]								Change in the PISA reading literacy score per 16.3 units of the international socio-economic index of occupational status[1]		Increased likelihood of students in the bottom quarter of the ISEI distribution scoring in the bottom quarter of the national reading literacy performance distribution[2]	
		All students		Bottom quarter		Second quarter		Third quarter		Top quarter		Bottom quarter		Second quarter		Third quarter		Top quarter					
		Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Mean index	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Change	S.E.	Ratio	S.E.
OECD COUNTRIES	Australia	52.3	(0.5)	31.1	(0.2)	46.3	(0.1)	58.4	(0.2)	73.2	(0.3)	**490**	(3.8)	523	(4.5)	538	(4.2)	**576**	(5.4)	**31.7**	(2.1)	**1.9**	(0.1)
	Austria	49.7	(0.3)	32.9	(0.2)	44.7	(0.1)	52.2	(0.1)	69.1	(0.3)	**467**	(3.9)	500	(3.3)	522	(3.4)	**547**	(3.5)	**35.2**	(2.1)	**2.1**	(0.1)
	Belgium	49.0	(0.4)	28.4	(0.1)	42.1	(0.1)	53.5	(0.1)	71.8	(0.2)	**457**	(6.2)	497	(4.5)	537	(3.2)	**560**	(3.4)	**38.2**	(2.2)	**2.4**	(0.1)
	Canada	52.8	(0.2)	31.3	(0.1)	48.1	(0.1)	58.9	(0.1)	72.9	(0.1)	**503**	(2.2)	529	(1.9)	545	(1.9)	**570**	(2.0)	**25.7**	(1.0)	**1.9**	(0.1)
	Czech Republic	48.3	(0.3)	31.2	(0.2)	44.4	(0.1)	51.5	(0.0)	66.1	(0.3)	**445**	(3.1)	487	(2.8)	499	(3.5)	**543**	(2.9)	**43.2**	(1.7)	**2.3**	(0.1)
	Denmark	49.7	(0.4)	29.0	(0.2)	44.0	(0.1)	54.9	(0.2)	71.1	(0.3)	**465**	(3.3)	490	(3.3)	511	(3.2)	**543**	(3.6)	**29.1**	(1.9)	**1.8**	(0.1)
	Finland	50.0	(0.4)	29.7	(0.2)	43.4	(0.1)	55.1	(0.1)	71.8	(0.2)	**524**	(4.5)	535	(3.3)	555	(3.1)	**576**	(3.3)	**20.8**	(1.8)	**1.5**	(0.1)
	France	48.3	(0.4)	27.7	(0.2)	41.1	(0.2)	53.1	(0.1)	71.2	(0.3)	**469**	(4.3)	496	(3.2)	520	(3.1)	**552**	(3.6)	**30.8**	(1.9)	**2.2**	(0.1)
	Germany	48.9	(0.3)	30.0	(0.2)	42.6	(0.1)	52.5	(0.1)	70.2	(0.2)	**427**	(5.4)	471	(4.0)	513	(3.4)	**541**	(3.5)	**45.3**	(2.1)	**2.6**	(0.2)
	Greece	47.8	(0.6)	25.6	(0.3)	40.2	(0.2)	53.0	(0.1)	72.3	(0.4)	**440**	(5.6)	460	(7.2)	486	(5.5)	**519**	(5.5)	**28.1**	(2.5)	**1.8**	(0.2)
	Hungary	49.5	(0.5)	30.4	(0.2)	42.6	(0.1)	53.7	(0.1)	71.5	(0.2)	**435**	(4.9)	461	(4.5)	504	(3.8)	**531**	(5.9)	**39.2**	(2.4)	**2.2**	(0.2)
	Iceland	52.7	(0.3)	31.4	(0.2)	47.3	(0.1)	58.6	(0.2)	73.8	(0.2)	**487**	(3.1)	496	(3.2)	513	(3.2)	**540**	(2.6)	**19.3**	(1.5)	**1.5**	(0.1)
	Ireland	48.4	(0.5)	28.5	(0.2)	42.7	(0.2)	53.2	(0.1)	69.4	(0.2)	**491**	(4.3)	520	(4.3)	535	(3.7)	**570**	(3.7)	**30.3**	(1.8)	**1.9**	(0.1)
	Italy	47.1	(0.3)	28.5	(0.1)	40.6	(0.1)	50.3	(0.1)	68.9	(0.4)	**457**	(4.3)	481	(3.3)	494	(3.6)	**525**	(3.9)	**26.4**	(1.8)	**1.8**	(0.1)
	Japan[3]	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Korea	42.8	(0.4)	26.5	(0.1)	35.9	(0.1)	46.0	(0.1)	62.9	(0.5)	**509**	(4.5)	524	(2.9)	531	(2.8)	**542**	(3.4)	**14.6**	(2.1)	**1.5**	(0.1)
	Luxembourg	44.8	(0.3)	25.1	(0.1)	37.5	(0.1)	50.6	(0.1)	66.1	(0.4)	**394**	(4.1)	428	(3.4)	473	(3.3)	**497**	(2.8)	**39.2**	(2.0)	**2.5**	(0.1)
	Mexico	42.5	(0.7)	24.4	(0.1)	32.3	(0.1)	46.8	(0.2)	66.5	(0.5)	**385**	(4.1)	408	(3.7)	435	(4.0)	**471**	(5.9)	**31.8**	(2.3)	**1.9**	(0.2)
	New Zealand	52.2	(0.4)	30.5	(0.3)	47.1	(0.1)	57.7	(0.2)	73.6	(0.2)	**489**	(4.3)	523	(3.8)	549	(3.4)	**574**	(4.5)	**31.9**	(2.1)	**2.0**	(0.1)
	Norway	53.9	(0.4)	35.6	(0.2)	47.1	(0.1)	59.0	(0.2)	73.9	(0.2)	**477**	(4.1)	494	(3.8)	514	(3.8)	**547**	(4.2)	**29.7**	(2.0)	**1.6**	(0.1)
	Poland	46.0	(0.5)	27.3	(0.2)	40.0	(0.1)	49.8	(0.1)	67.0	(0.4)	**445**	(5.6)	472	(4.8)	493	(5.3)	**534**	(6.4)	**35.4**	(2.7)	**2.0**	(0.2)
	Portugal	43.9	(0.6)	26.8	(0.2)	34.5	(0.1)	48.4	(0.1)	65.7	(0.5)	**431**	(4.9)	452	(4.9)	485	(4.3)	**527**	(5.0)	**38.4**	(2.1)	**2.0**	(0.1)
	Spain	45.0	(0.6)	26.8	(0.1)	36.2	(0.1)	49.6	(0.1)	67.3	(0.5)	**461**	(3.5)	482	(3.6)	507	(2.7)	**529**	(3.0)	**26.5**	(1.6)	**1.9**	(0.1)
	Sweden	50.6	(0.4)	30.4	(0.2)	44.1	(0.1)	55.7	(0.1)	72.1	(0.2)	**485**	(2.9)	509	(3.2)	522	(3.1)	**558**	(3.3)	**27.1**	(1.5)	**1.8**	(0.1)
	Switzerland	49.2	(0.5)	29.3	(0.2)	42.5	(0.1)	53.2	(0.1)	71.9	(0.3)	**434**	(4.3)	492	(4.6)	513	(4.3)	**549**	(5.3)	**40.2**	(2.2)	**2.7**	(0.2)
	United Kingdom	51.3	(0.3)	30.7	(0.2)	45.7	(0.1)	56.9	(0.2)	71.8	(0.2)	**481**	(3.1)	513	(3.1)	543	(3.5)	**579**	(3.6)	**38.4**	(1.6)	**2.1**	(0.1)
	United States	52.4	(0.8)	30.3	(0.2)	47.4	(0.2)	59.5	(0.2)	72.5	(0.3)	**466**	(7.5)	507	(5.9)	528	(6.1)	**556**	(5.9)	**33.5**	(2.7)	**2.1**	(0.2)
	OECD total	*49.0*	*(0.2)*	*29.1*	*(0.1)*	*42.5*	*(0.1)*	*54.0*	*(0.1)*	*70.3*	*(0.1)*	*462*	*(2.3)*	*492*	*(1.7)*	*515*	*(1.9)*	*543*	*(2.1)*	*34.0*	*(0.9)*	*2.0*	*(0.1)*
	OECD average	*48.9*	*(0.1)*	*29.3*	*(0.0)*	*42.4*	*(0.0)*	*53.6*	*(0.0)*	*70.2*	*(0.1)*	*463*	*(0.9)*	*491*	*(0.8)*	*515*	*(0.7)*	*545*	*(0.9)*	*33.6*	*(0.4)*	*2.0*	*(0.0)*
NON-OECD COUNTRIES	Brazil	43.9	(0.6)	24.6	(0.2)	34.5	(0.2)	49.6	(0.2)	67.1	(0.4)	**368**	(3.9)	387	(3.8)	413	(4.0)	**435**	(4.5)	**26.1**	(1.9)	**1.9**	(0.1)
	Latvia	50.2	(0.5)	27.7	(0.1)	40.4	(0.2)	58.5	(0.3)	74.1	(0.3)	**428**	(6.4)	449	(5.0)	479	(6.7)	**492**	(6.6)	**21.3**	(2.2)	**1.8**	(0.1)
	Liechtenstein	47.5	(0.9)	28.0	(0.6)	41.8	(0.4)	52.1	(0.2)	68.2	(0.9)	**437**	(11.0)	491	(11.9)	495	(9.1)	**523**	(9.3)	**32.6**	(5.2)	**2.1**	(0.4)
	Russian Federation	49.4	(0.5)	30.0	(0.2)	40.3	(0.1)	53.4	(0.2)	73.9	(0.2)	**429**	(5.5)	450	(3.8)	472	(4.7)	**502**	(3.9)	**26.5**	(1.9)	**1.8**	(0.1)
	Netherlands[4]	50.9	(0.5)	29.5	(0.2)	45.3	(0.2)	57.3	(0.3)	71.3	(0.2)	**495**	(5.6)	525	(5.2)	555	(3.6)	**566**	(4.4)	**29.9**	(2.4)	**2.2**	(0.2)

1. Unit changes marked in bold are statistically significant. Where bottom and top quarters are marked in bold this indicates that their difference is statistically significant. 16.3 units on the index corresponds to one international standard deviation.
2. Ratios statistically significantly greater than 1 are marked in bold.
3. Japan was excluded from this comparison because of a high proportion of missing data.
4. Response rate is too low to ensure comparability (see Annex 3 at *www.oecd.org/els/education/eag2002*).

Source: OECD PISA database, 2001. See Annex 3 for notes on methodology (*www.oecd.org/els/education/eag2002*) and *www.pisa.oecd.org*.

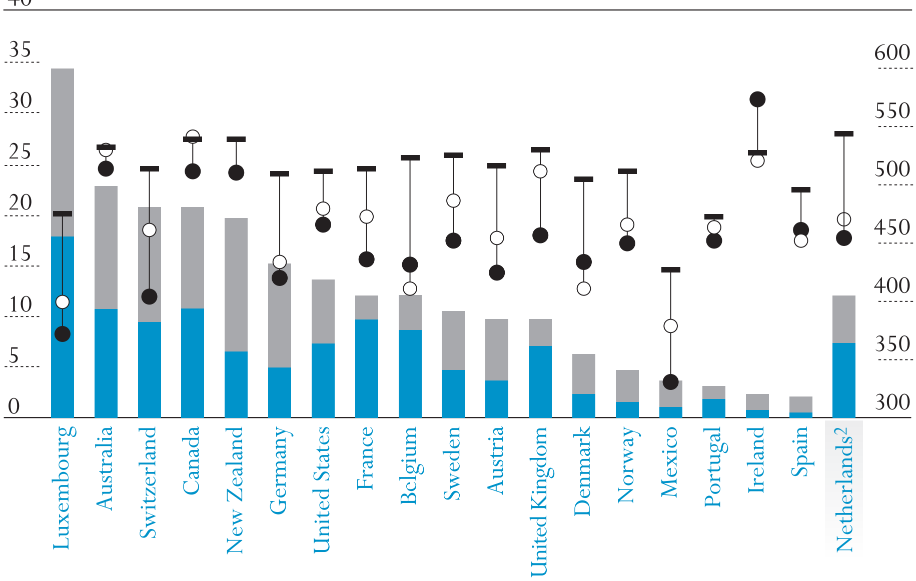
A10

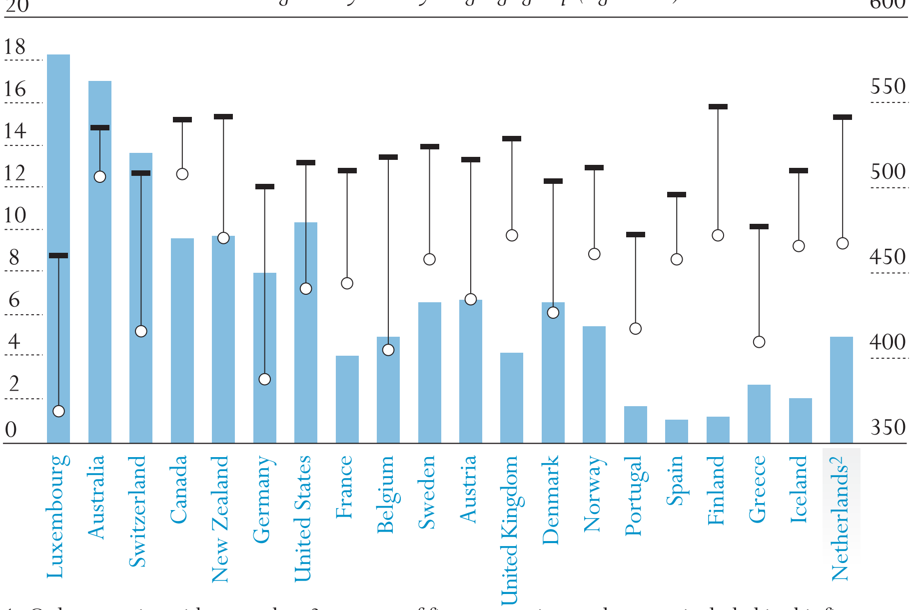
PLACE OF BIRTH, LANGUAGE SPOKEN AT HOME, AND READING LITERACY OF 15-YEAR-OLDS

- In most countries with significant immigrant populations, first-generation 15-year-olds read well below the level of native students even if they were themselves born in the country.
- Not surprisingly, students not speaking the majority language at home perform much less well than those who do and are much more likely to score among the lowest quarter of students in each country.
- Students born abroad lag behind even more, although to widely varying degrees in different countries.
- In some countries, students in families that do not speak the test language at home most of the time still do relatively well in reading. For instance, students in Australia and Canada score similarly to the OECD average and similar to the averages in many countries that have few minority-language students.

Chart A10.1.

Place of birth and home language, and student performance on the PISA reading literacy scale (2000)





1. Only countries with more than 3 per cent of first-generation students are included in this figure.
2. Response rate is too low to ensure comparability (see Annex 3).
3. Only countries with more than 3 per cent of students who speak a language at home most of the time that is different from the language of assessment, from other official languages or from other national dialects are included in this figure.

Countries are ranked in descending order of the total percentage of non-native and first-generation students.
Source: OECD PISA database, 2001. Tables A10.1 and A10.2. See Annex 3 for notes on methodology (*www.oecd.org/els/education/eag2002*) and *www.pisa.oecd.org*.

Policy context

Increased migration poses challenges for education systems and comparing how successfully countries address these, as done by this Indicator, can provide important policy insights.

Migration from one country to another is increasingly common as international trade expands, as employment opportunities attract people to better or different livelihoods, and as nations find themselves providing sanctuary for refugees from political and economic turmoil. For whatever reasons people migrate from one country to another, their school-aged children often find themselves in a new environment in which the language of instruction may be unfamiliar to them. Compelled to learn in a non-native language, and perhaps required to adjust to a new socio-cultural environment, some of these sons and daughters of immigrant parents can be expected to lag academically behind their peers whose first language is also the language of instruction.

Cross-national analysis can provide some insight into the characteristics that help some countries to succeed better than others in accommodating these differences.

Evidence and explanations

PISA allows to relate student performance to their migration status and home language…

To examine the effects of immigrant and language status on proficiency in reading literacy, PISA asked students to indicate whether each of their parents was born in the country in which the students live or in another country, as well as where they themselves were born. In addition, students were asked what language they speak at home most of the time.

…but there are limits to the interpretation of these data.

It is important to recognise the limits of the available data. PISA did not ask students how long they had lived in the country where the assessment took place. Some or even many of the students who were born outside the country may have lived inside the country for most of their lives and be fluent in the language of instruction. Others, by contrast, may be recent arrivals in the midst of their second year of schooling in their "new" country. When interpreting these results, it also needs to be taken into account that students who were unable to read or speak the test language because they had received less than one year of instruction in the language of the assessment were excluded. Likewise, there is no information available about how similar or different a student's first language might be from the language of instruction, which conceivably could have an impact on second language abilities. And finally, the socio-economic composition of the immigrant population may vary across countries.

Place of birth

The analysis compares…

To assess the effect of place of birth on performance, three categories of students are compared:

…"native" students,…

- those students born in the country where the assessment took place and who have at least one parent born in that country (referred to here as "native" students);

- those students born in the country where the assessment took place but both of whose parents were born in another country (referred to here as "first-generation" students); and

…"first-generation" students…

- those students born outside the country where the assessment took place and whose parents were also born in another country (referred to here as "non-native" students).

…and "non-native" students.

For many non-native students, the test language will be a second language (note that the second half of this indicator deals with students' home language), and some will not have many years of experience in the educational system of the country in which they are tested. First-generation students also may be in families in which the first language, or the language spoken at home, is not the language of instruction. Regardless of their place of birth, students in these two categories need to acquire the same knowledge and skills that native-born students are expected to have as they move toward the completion of their formal education.

Language is a key issue for many students born abroad or with immigrant parents.

A comparison of the reading literacy of first-generation students with that of native students in the 14 countries in which first-generation students represent at least 3 per cent of students assessed in PISA 2000, reveals significant differences in favour of native students in ten of the 14 countries (see Chart A10.1). The differences between these students' performance on the reading literacy scale range from 31 to 41 points in France, New Zealand, Sweden and the United States; to about 53 to 62 points in Austria, Liechtenstein and Switzerland in the middle; and to more than 70 points, or nearly a full proficiency level in the Belgium, Germany, Luxembourg and Netherlands, which has the largest difference at 112 points.

In most countries with significant immigrant populations, first-generation students read at levels that are well below the level of native students…

These are troubling differences because both groups of students were born in the country of the test and, presumably, have experienced the same curriculum and benefits that their national education systems offer to all students. Despite the possible similarities in their educational "histories", first-generation students are at a relative disadvantage in these countries in terms of reading literacy. In countries in which first-generation students perform significantly lower than native students and in which there are proportionately large numbers of first-generation students – including Liechtenstein (about 10 per cent), Luxembourg (about 18 per cent) and Switzerland (about 9 per cent) – this may be a particular concern.

…even though they were themselves born in the country – which is disturbing.

A further comparison can be made between non-native and native students. In view of the differences between native and first-generation students in many countries and the differences between first-generation and non-native students in some countries, one would expect the largest overall differences to be between non-native and native students. In 13 of 14 countries, data support this expectation. On average, native students outscore their non-native peers in these 14 countries in reading literacy by 73 points, or by a full proficiency level. The differences range from 103 to 112 points in Liechtenstein, Luxembourg

Students born abroad lag behind even more, although to widely varying degrees in different countries.

and Switzerland and from 72 to 93 points in Austria, Belgium, France, Germany, the Netherlands, Sweden and the United Kingdom. The smallest significant differences are in Canada (27 points), New Zealand (30 points) and the United States (45 points). Australia, with a difference of 19 points, is the only country in which differences between these two groups of students are not significant.

Differences between first-generation and non-native students tend to be smaller.

Comparing first-generation students with non-native students among the same 14 countries reveals no statistically significant differences in reading literacy performance in six of the countries: Australia, Belgium, Germany, the Netherlands, New Zealand and the United States. In other words, in these six countries, PISA does not detect a performance-related disadvantage in reading literacy associated with place of birth (*i.e.*, in or outside the country) among students whose parents were not born in the country. The remaining eight countries in which the differences between first-generation and non-native students *are* statistically significant are Austria, Canada, France, Liechtenstein, Luxembourg, Sweden, Switzerland and the United Kingdom. In these countries, non-native students score from 28 to 58 points lower on the reading literacy scale than do first-generation students, although, in absolute terms, they still score well when compared with non-native students in other countries. Non-native students represent about 2 per cent of students who participated in PISA 2000 in France and the United Kingdom, slightly less than 6 per cent of students in Austria and Sweden, and between 9 and 16 per cent of students in the four other countries in which differences between these groups of students are significant.

Language spoken at home

Not surprisingly, students not speaking the majority language at home perform much less well than those who do…

Another way to examine the immigration issue is to examine what language students speak at home. To assess the effect of language on students' performance in reading literacy, two categories of students are compared.

- those students who speak the language of the test or another national language or dialect most of the time (referred to here as "majority-language students"); and

- those students who routinely converse with their parents and siblings in another language (referred to here as "minority-language" students).

Across the 17 countries in which at least 3 per cent of all students taking the PISA assessments are in the latter group, majority-language students outperform minority-language students (see Chart A10.1). The average difference between the two groups in reading literacy is 66 points. The differences range from about 30 to 34 points in Australia, Canada and the Russian Federation to around 114 points in Belgium and Germany.

One consequence of these differences is that the 15-year-old-students in Belgium, Denmark, Germany, Luxembourg and Switzerland who do not speak the test language at home are at least two and one-half times more likely to be among the lowest 25 per cent of performers in reading literacy as those students who speak the test language most of the time. In Austria, France, Greece, the Netherlands, New Zealand, Sweden and the United States, minority-language students are more than twice as likely as are majority-language students to be in the bottom quarter of performance in reading literacy.

…and are much more likely to score among the lowest quarter of students in each country…

However, in some countries, students in families that do not speak the test language at home most of the time still do relatively well in reading. For instance, students in Australia and Canada score similarly to the OECD average and similar to the averages in many countries that have few minority-language students.

…with the exception of English-speaking countries where those differences tend to be smaller.

One interesting observation is that minority-language students tend to do relatively well in English-speaking countries. The average difference between minority- and majority-language students in the five predominantly English-speaking countries (Australia, Canada, New Zealand, United Kingdom and the United States) is 54 points in reading literacy. Minority-language students also do reasonably well, with a mean difference of 66 points in reading literacy, in Denmark, the Netherlands, Norway and Sweden, with large proportions of such students. By contrast, minority-language students display the largest deficits, an average of 95 points, in the OECD's German-speaking countries.

Definitions and methodologies

The target population studied for this indicator was 15-year-old students. Operationally, this refers to students aged between 15 years and 3 (completed) months and 16 years and 2 (completed) months at the beginning of the testing period and enrolled in an educational institution, regardless of the grade level or type of institutions in which they were enrolled and of whether they participated in school full-time or part-time.

The achievement scores are based on assessments administered as part of the Programme for International Student Assessment (PISA) undertaken by the OECD during 2000.

To address the language issue, PISA's context questionnaire asked students "what language do you speak at home most of the time", to which they could indicate that they speak the language in which the assessment was undertaken, an "other official national language", "other national dialects or languages," or "other languages." The data presented in this indicator compare students in the last group (*i.e.*, "other languages") with students in the first three groups.

In Table A10.2 a measure of the increased likelihood that a student with a particular characteristic will be in the bottom quarter of the distribution on the reading literacy scale is shown. This is a measure of relative probability. For example, the value "2" for the increased likelihood of a student who does not speak the language of assessment at home most of the time to score in the bottom quarter of the achievement distribution says that students from another language background are twice as likely to be among the lowest performers as students who speak the language of the assessment at home most of the time.

For notes on standard errors, significance tests, and multiple comparisons see Annex 3 at *www.oecd.org/els/education/eag2002*.

Table A10.1.
Performance in reading literacy and country of birth of 15-year-olds and their parents (2000)
Percentage of students and performance on the PISA reading literacy scale, by students' country of birth and the place of birth of their parents, based on students' self-reports

	Native students *(students who were born in the country of assessment with at least one of their parents born in the same country)*				First-generation students *(students who were born in the country of assessment but whose parents were foreign-born)*				Non-native students *(students who were foreign-born and whose parents were also foreign-born)*			
			Performance on the PISA reading literacy scale[2]				Performance on the PISA reading literacy scale[2]				Performance on the PISA reading literacy scale	
	Percentage of students[1]	S.E.	Mean score	S.E.	Percentage of students[1]	S.E.	Mean score	S.E.	Percentage of students[1]	S.E.	Mean score	S.E.
OECD COUNTRIES												
Australia	77.4	(1.8)	532	(3.6)	10.7	(1.1)	528	(7.1)	11.9	(1.2)	513	(9.3)
Austria	90.4	(0.9)	**515**	(2.4)	3.7	(0.4)	**453**	(9.4)	5.9	(0.6)	422	(8.2)
Belgium	88.0	(1.1)	**522**	(3.8)	8.6	(0.9)	**411**	(8.7)	3.4	(0.4)	431	(9.5)
Canada	79.5	(1.0)	538	(1.5)	10.8	(0.5)	539	(3.1)	9.8	(0.6)	511	(4.9)
Czech Republic	98.9	(0.2)	501	(2.1)	0.6	(0.1)	c	c	0.5	(0.1)	c	c
Denmark	93.8	(0.6)	**504**	(2.2)	2.4	(0.4)	**409**	(13.9)	3.8	(0.4)	433	(7.6)
Finland	98.7	(0.2)	548	(2.6)	0.2	(0.1)	c	c	1.0	(0.2)	468	(12.9)
France	88.0	(0.9)	**512**	(2.8)	9.8	(0.7)	**471**	(6.2)	2.2	(0.3)	434	(11.5)
Germany	84.8	(0.8)	**507**	(2.3)	5.1	(0.5)	**432**	(9.0)	10.1	(0.6)	419	(7.5)
Greece	95.2	(0.9)	478	(4.7)	0.5	(0.1)	c	c	4.3	(0.9)	403	(17.5)
Hungary	98.3	(0.2)	482	(4.0)	0.1	(0.0)	c	c	1.6	(0.2)	486	(11.6)
Iceland	99.2	(0.2)	509	(1.5)	0.2	(0.1)	c	c	0.6	(0.1)	c	c
Ireland	97.7	(0.3)	528	(3.2)	0.9	(0.2)	519	(20.2)	1.4	(0.3)	573	(9.2)
Italy	99.1	(0.2)	489	(2.9)	0.2	(0.1)	c	c	0.8	(0.2)	445	(15.1)
Japan	99.9	(0.1)	525	(5.1)	0.0	(0.0)	c	c	0.1	(0.1)	c	c
Korea[3]	a	a	a	a	a	a	a	a	a	a	a	a
Luxembourg	65.8	(0.7)	**474**	(1.7)	17.8	(0.7)	**399**	(4.6)	16.4	(0.6)	370	(4.7)
Mexico	96.4	(0.4)	**427**	(3.3)	1.1	(0.2)	**378**	(15.3)	2.5	(0.3)	329	(8.2)
New Zealand	80.4	(1.1)	**538**	(2.7)	6.4	(0.5)	**507**	(10.3)	13.2	(0.8)	507	(7.6)
Norway	95.4	(0.4)	**510**	(2.7)	1.5	(0.2)	**464**	(10.6)	3.1	(0.3)	449	(8.5)
Poland	99.7	(0.1)	482	(4.4)	0.0	(0.0)	c	c	0.2	(0.1)	c	c
Portugal	96.9	(0.3)	472	(4.5)	1.8	(0.2)	463	(14.3)	1.4	(0.2)	450	(15.8)
Spain	98.0	(0.4)	**494**	(2.6)	0.6	(0.1)	**450**	(15.9)	1.4	(0.3)	460	(17.8)
Sweden	89.5	(0.9)	**523**	(2.1)	4.7	(0.6)	**485**	(7.3)	5.9	(0.6)	450	(7.2)
Switzerland	79.3	(0.9)	**514**	(4.0)	9.3	(0.6)	**460**	(6.8)	11.4	(0.7)	402	(6.1)
United Kingdom	90.4	(1.2)	528	(2.6)	7.0	(0.9)	510	(9.4)	2.6	(0.4)	456	(15.1)
United States	86.4	(2.1)	511	(6.5)	7.4	(1.4)	478	(19.4)	6.1	(0.9)	466	(10.0)
OECD total	91.3	(0.6)	503	(1.9)	4.6	(0.4)	479	(9.1)	4.1	(0.3)	452	(4.9)
OECD average	91.0	(0.2)	506	(0.6)	4.3	(0.1)	467	(2.8)	4.7	(0.1)	446	(2.5)
NON-OECD COUNTRIES												
Brazil	99.6	(0.1)	398	(3.0)	0.3	(0.1)	c	c	0.1	(0.1)	c	c
Latvia	77.9	(2.4)	**462**	(6.0)	1.5	(0.3)	**423**	(15.1)	20.6	(2.4)	454	(7.3)
Liechtenstein	79.4	(2.1)	**500**	(5.0)	10.2	(1.8)	**446**	(14.8)	10.4	(1.6)	392	(21.4)
Russian Federation	95.4	(0.6)	463	(4.3)	1.8	(0.3)	452	(9.9)	2.8	(0.4)	458	(9.6)
Netherlands[4]	88.1	(1.8)	**542**	(3.0)	7.4	(1.2)	**470**	(14.2)	4.5	(0.8)	453	(15.6)

1. Percentage of students participating in the assessment of reading literacy in the respective category.
2. Mean scores marked in bold indicate that the difference in performance between native and first-generation students is statistically significant.
3. This question was not asked in Korea.
4. Response rate is too low to ensure comparability (see Annex 3 at *www.oecd.org/els/education/eag2002*).
Source: OECD PISA database, 2001. See Annex 3 for notes on methodology *(www.oecd.org/els/education/eag2002)* and *www.pisa.oecd.org.*

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Table A10.2.

Performance in reading literacy and language spoken at home of 15-year-olds (2000)

Student performance on the PISA reading literacy scale, by language spoken at home, and increased likelihood of students who do not speak the language of assessment at home scoring in the bottom quarter of the national reading literacy performance distribution, based on students' self-reports

		Language spoken at home most of the time IS DIFFERENT from the language of assessment, from other official languages or from other national dialects				Language spoken at home most of the time IS THE SAME as the language of assessment, other official languages or another national dialects				Increased likelihood of students who do not speak the language of assessment at home scoring in the bottom quarter of the national reading literacy performance distribution[3]	
				Performance on the PISA reading literacy scale[2]				Performance on the PISA reading literacy scale[2]			
		Percentage of students[1]	S.E.	Mean score	S.E.	Percentage of students[1]	S.E.	Mean score	S.E.	Ratio	S.E.
OECD COUNTRIES	Australia	17.0	(1.6)	**504**	(7.6)	83.0	(1.6)	**534**	(3.6)	**1.6**	(0.1)
	Austria	6.7	(0.7)	**434**	(7.2)	93.3	(0.7)	**515**	(2.4)	**2.3**	(0.2)
	Belgium	4.9	(0.6)	**403**	(8.6)	95.2	(0.6)	**518**	(3.7)	**2.8**	(0.2)
	Canada	9.4	(0.6)	**506**	(3.8)	90.6	(0.6)	**540**	(1.5)	**1.6**	(0.1)
	Czech Republic	0.8	(0.2)	c	c	99.2	(0.2)	494	(2.2)	c	c
	Denmark	6.7	(0.4)	**425**	(8.1)	93.3	(0.4)	**503**	(2.2)	**2.5**	(0.2)
	Finland	1.3	(0.2)	470	(12.5)	98.7	(0.2)	548	(2.6)	c	c
	France	4.0	(0.5)	**442**	(7.7)	96.0	(0.5)	**510**	(2.6)	**2.3**	(0.2)
	Germany	7.9	(0.8)	**386**	(13.9)	92.1	(0.8)	**500**	(2.9)	**2.9**	(0.3)
	Greece	2.8	(0.6)	**407**	(18.3)	97.2	(0.6)	**477**	(4.8)	**2.3**	(0.4)
	Hungary	m	m	m	m	m	m	m	m	m	m
	Iceland	1.9	(0.3)	**463**	(13.4)	98.1	(0.3)	**509**	(1.5)	c	c
	Ireland	0.9	(0.2)	c	c	99.1	(0.2)	527	(3.2)	c	c
	Italy	0.7	(0.2)	c	c	99.3	(0.2)	491	(3.0)	c	c
	Japan	0.3	(0.1)	c	c	99.7	(0.1)	525	(5.2)	c	c
	Korea[4]	a	a	a	a	a	a	a	a	a	a
	Luxembourg	18.3	(0.7)	**367**	(4.1)	81.7	(0.7)	**460**	(1.6)	**2.8**	(0.1)
	Mexico	0.2	(0.1)	c	c	99.8	(0.1)	422	(3.4)	c	c
	New Zealand	9.6	(0.6)	**469**	(9.6)	90.4	(0.6)	**541**	(2.6)	**2.1**	(0.2)
	Norway	5.3	(0.4)	**459**	(8.4)	94.7	(0.4)	**510**	(2.8)	**1.8**	(0.1)
	Poland	0.5	(0.2)	c	c	99.5	(0.2)	482	(4.4)	c	c
	Portugal	1.5	(0.2)	**416**	(13.8)	98.5	(0.2)	**471**	(4.6)	c	c
	Spain	1.2	(0.2)	**456**	(16.0)	98.8	(0.2)	**495**	(2.6)	c	c
	Sweden	6.7	(0.6)	**456**	(7.1)	93.3	(0.6)	**523**	(2.0)	**2.1**	(0.2)
	Switzerland	13.6	(0.6)	**414**	(6.1)	86.4	(0.6)	**509**	(4.1)	**2.8**	(0.2)
	United Kingdom	4.1	(0.7)	**470**	(12.8)	95.9	(0.7)	**528**	(2.5)	**1.9**	(0.2)
	United States	10.8	(2.4)	**438**	(13.1)	89.2	(2.4)	**514**	(5.8)	**2.1**	(0.2)
	OECD total	5.5	(0.7)	443	(8.2)	94.5	(0.7)	503	(1.8)	2.0	(0.1)
	OECD average	5.5	(0.2)	440	(2.6)	94.5	(0.2)	506	(0.6)	2.1	(0.0)
NON-OECD COUNTRIES	Brazil	0.8	(0.2)	c	c	99.2	(0.2)	397	(3.0)	c	c
	Latvia	0.0	(0.0)	a	a	100.0	(0.0)	460	(5.2)	a	a
	Liechtenstein	20.7	(2.2)	**441**	(14.3)	79.3	(2.2)	**494**	(5.1)	c	c
	Russian Federation	7.3	(2.1)	**432**	(9.3)	92.7	(2.1)	**465**	(4.3)	**1.5**	(0.2)
	Netherlands[5]	6.3	(1.1)	**466**	(13.1)	93.7	(1.1)	**539**	(2.7)	**2.2**	(0.3)

1. Percentage of students participating in the assessment of reading literacy in the respective category.
2. Mean scores marked in bold indicate that the difference in performance between students who do not speak the language of assessment at home and those who do is statistically significant.
3. Ratios statistically significantly greater than 1 are marked in bold.
4. This question was not asked in Korea.
5. Response rate is too low to ensure comparability (see Annex 3 at *www.oecd.org/els/education/eag2002*).

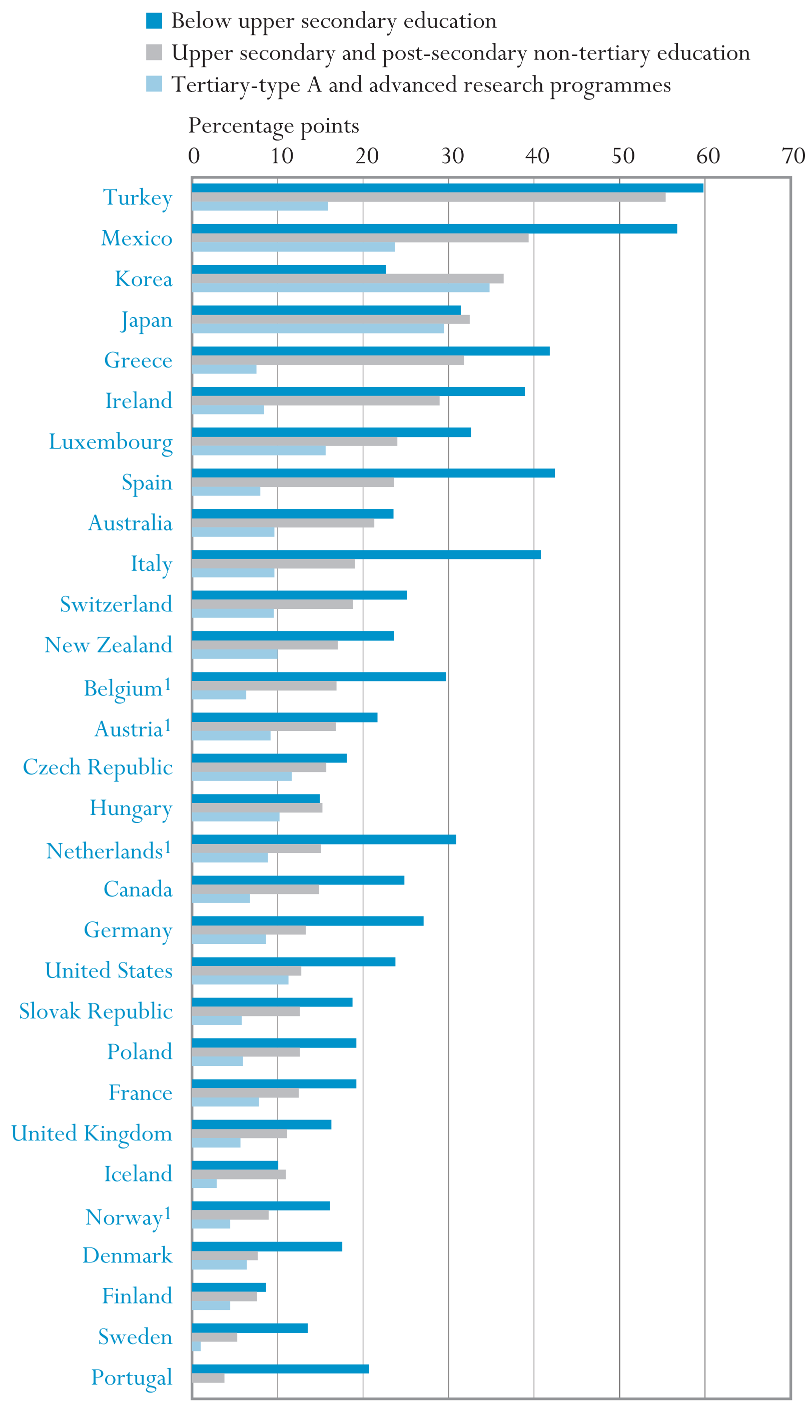
Source: OECD PISA database, 2001. See Annex 3 for notes on methodology (*www.oecd.org/els/education/eag2002*) and *www.pisa.oecd.org*.

LABOUR FORCE PARTICIPATION BY LEVEL OF EDUCATIONAL ATTAINMENT

- Labour force participation rates rise with educational attainment in most OECD countries. With very few exceptions, the participation rate for graduates of tertiary education is markedly higher than that for upper secondary graduates. The gap in male participation rates is particularly wide between upper secondary graduates and those without an upper secondary qualification.
- The labour force participation rate for women with less than upper secondary attainment is particularly low. Rates for women with tertiary attainment approach or exceed 80 per cent in all but four countries, but remain below those of men in all countries except one.
- The gender gap in labour force participation decreases with increasing educational attainment. Although a gender gap in labour force participation remains among those with the highest educational attainment, it is much narrower than among those with lower qualifications.

Chart A11.1.

Differences between labour force participation rates of males and females, by level of educational attainment for 25 to 64-year-olds (2001)



1. Year of reference 2000.

Countries are ranked in descending order of the difference between labour force participation rates of males and females who have upper secondary education and post-secondary non-tertiary education.

Source: OECD. Table 11.1. See Annex 3 for a description of ISCED-97 levels, ISCED-97 country mappings and national data sources *(www.oecd.org/els/education/eag2002)*.

Policy context

This indicator examines the relationship between educational attainment and labour-market status.

OECD economies and labour markets are becoming increasingly dependent on a stable supply of well-educated workers to further their economic development and to maintain their competitiveness. As levels of skill tend to rise with educational attainment, the costs incurred when those with higher levels of education do not work also rise; and as populations in OECD countries age, higher and longer participation in the labour force can lower dependency ratios and help to alleviate the burden of financing public pensions.

This indicator examines the relationship between educational attainment and labour force activity, comparing rates of participation in the labour force first, and then rates of unemployment. The adequacy of workers' skills and the capacity of the labour market to supply jobs that match those skills are important issues for policy-makers.

Evidence and explanations

Labour force participation

Labour force participation rates for men vary less between countries than those for women.

Variation between countries in participation by women is a primary factor in the differences in overall participation rates between OECD countries. The overall labour force participation rates for men aged 25 to 64 range from 81 per cent or less in Hungary and Italy to 94 per cent and above in Iceland, Japan, Mexico and Switzerland (Chart A11.1). By contrast, labour force participation among women ranges from 55 per cent or less in Greece, Italy, Mexico, Spain and Turkey, to over 77 per cent in the Nordic countries. Prolonged education and non-employment are two factors which contribute to these disparities, generally increasing the number of people not in the labour force.

Labour force participation rates for men rise with educational attainment in most OECD countries.

Labour force participation rates for men are generally higher among those with higher educational qualifications. With the exception of Mexico, Spain and Turkey, where the trend is less pronounced, the participation rate for graduates of tertiary education is markedly higher than that for upper secondary graduates. The difference ranges from a few percentage points to between 8 and 10 per cent in Austria, Denmark, Germany and Poland. It is very small between the ages of 35 and 44, when most people are in employment, and may stem mainly from the fact that the less skilled leave the labour market earlier. After 55, those with higher educational attainment tend to remain in employment longer than others (Table A11.1).

The gap in male participation rates is particularly wide between those with and those without an upper secondary qualification.

The gap in participation rates of 25 to 64 year-old males is particularly wide between upper secondary graduates and those who have not completed an upper secondary qualification. In 14 out of 29 OECD countries, the difference in the rate of participation between upper secondary graduates and those without such a qualification exceeds ten percentage points. The most extreme case is Hungary, where only half of the male population without upper secondary education, but over 80 per cent with such attainment, participate in the labour force. The gap in participation rates between men with low and men with high educational attainment is small in Iceland, Korea, Mexico, Portugal, Switzerland and Turkey.

Among women, the difference in labour force participation by level of educational attainment is even wider.

Labour force participation rates for women aged 25 to 64 years show yet more marked differences, not only between those with below upper secondary and those with upper secondary attainment (around 20 percentage points or more in 15 out of the 30 OECD countries) but also between those with upper secondary and those with tertiary attainment (around 10 percentage points or more in 22 countries). Particular exceptions are Japan, Korea and Sweden where participation rates for women with upper secondary qualifications approach those for women with a tertiary qualification (a difference of around 5 to 7 percentage points).

Labour force participation among women with qualifications below upper secondary is particularly low…

Participation rates for women with less than upper secondary attainment are particularly low, averaging about 50 per cent over all OECD countries and around one-third or below in Hungary, Italy and Turkey. Rates for women with tertiary attainment approach or exceed 80 per cent everywhere except Hungary, Japan, Korea, Luxembourg, Mexico and Turkey, but remain below those of men in all countries (Table A11.1).

…but the gender gap in labour force participation decreases with increasing educational attainment.

Although the gender gap in labour force participation remains among those with the highest educational attainment, it is much narrower than among those with lower qualifications. On average across OECD countries, with each additional level attained, the difference between the participation of men and women decreases by 10 percentage points: from not far from 30 percentage points at below upper secondary level, to 20 percentage points at upper secondary and 10 percentage points at tertiary level.

The education gap in male participation in the labour force is strongly influenced by differences among the older population.

Much of the overall gap between the labour force participation rates of men with differing educational attainment is explained by larger differences in the older populations, particularly among men between the ages of 55 and 64 (Table A11.1). More than 70 per cent of 55 to 64-year-olds with a tertiary-level qualification are active in the labour force in 20 out of 29 countries. Only Greece, Korea, Mexico and Turkey have participation rates as high among those who have not completed upper secondary education. By contrast, the education gap in female labour force participation is relatively wide in all age groups.

The patterns observed here reflect a number of underlying causes. Since earnings tend to increase with educational attainment, the monetary incentive to participate is greater for individuals with higher qualifications. In addition, those individuals often work on more interesting and stimulating tasks, and hold functions of higher responsibility, which increase their motivation to remain in the labour force. Conversely, hard physical work, generally associated with rather low levels of education, can lead to a need for early retirement. Moreover, industrial restructuring in many countries has reduced job opportunities for unskilled workers, or for workers with particular skills that have been made obsolete by new technologies. A sizeable number of these people have left the

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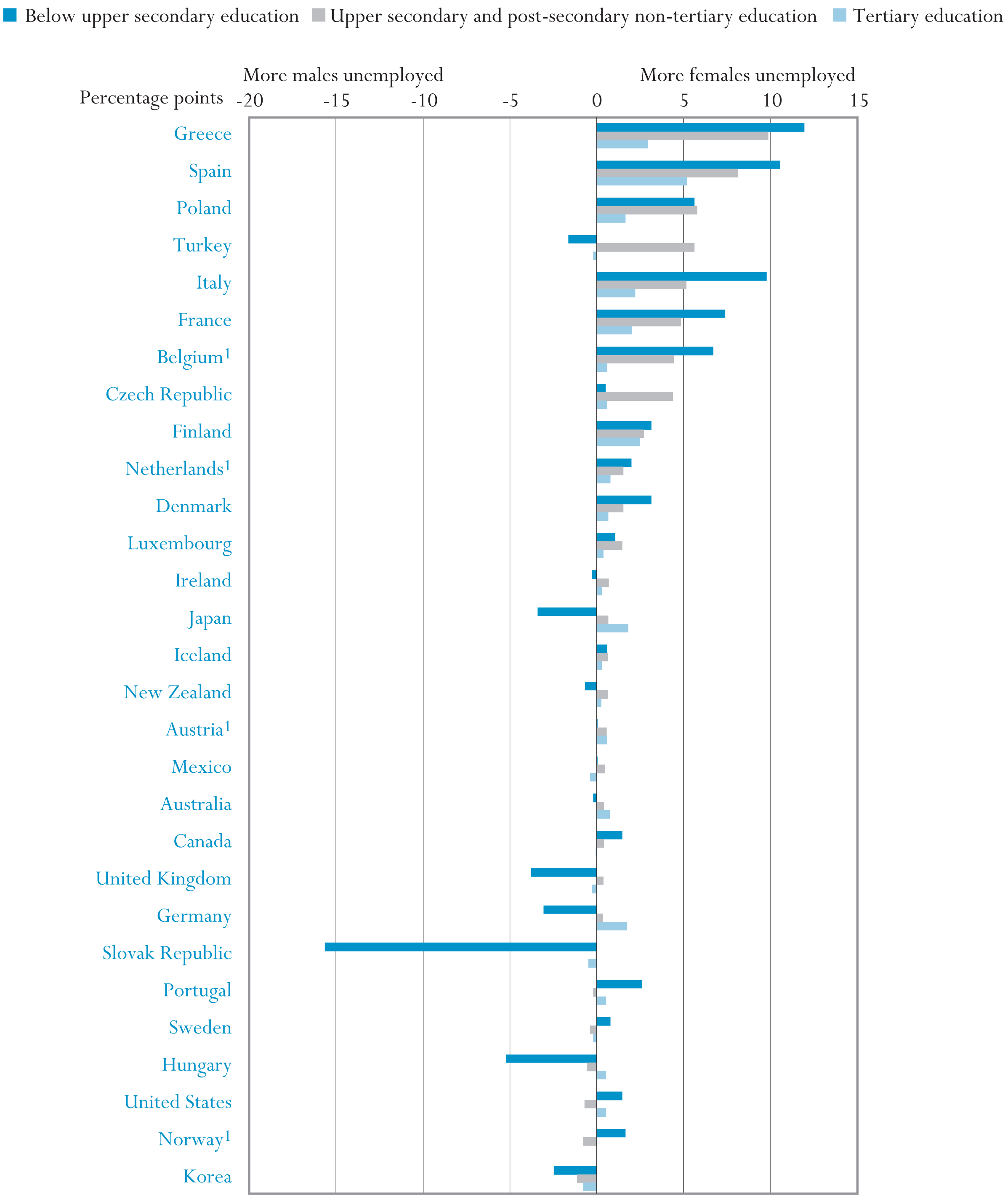
Chart A11.2.

Differences between unemployment rates of females and males, by level of educational attainment, for 30 to 44-year-olds (2001)



1. Year of reference 2000.

Countries are ranked in descending order of the difference between unemployment rates of females and males who have completed upper secondary education or post-secondary non-tertiary education.

Source: OECD. Table A11.2. See Annex 3 for a description of ISCED-97 levels, ISCED-97 country mappings and national data sources *(www.oecd.org/els/education/eag2002)*.

labour market either through early retirement schemes or because there are only limited job opportunities. The educational attainment of women and their participation rates in the labour market have been lower historically than those of men, and in spite of considerable advances over the last few decades, current participation rates continue to show the impact of these historical factors.

Unemployment rates by level of educational attainment

Those with low educational attainment are both less likely to be labour force participants and more likely to be unemployed.

The unemployment rate is a measure of a particular economy's ability to supply a job to everyone who wants one. To the extent that educational attainment is assumed to be an indicator of skill, it can signal to employers the potential knowledge, capacities and workplace performance of candidates for employment. The employment prospects of individuals of varying educational attainment will depend both on the requirements of labour markets and on the supply of workers with differing skills. Those with low educational qualifications are at particular risk of economic marginalisation since they are both less likely to be labour force participants and more likely to be without a job if they are actively seeking one.

Unemployment rates fall with higher educational attainment.

In 19 out of the 30 OECD countries, male labour force participants aged 25 to 64 with a qualification below upper secondary education are more than 1.5 times as likely to be unemployed as their counterparts who have completed upper secondary education (Chart A11.2). In 17 countries, the unemployment rate for male upper secondary graduates is at least 1.5 times the unemployment rate among tertiary graduates. At the tertiary level, completion of shorter vocationally-oriented programmes (ISCED 5B) is associated with unemployment rates for the adult population which are higher than those for graduates of more theoretical, longer programmes at ISCED level 5A in about half of the countries, but significantly lower in the others (Table A11.2).

In most countries, the disparities in unemployment rates between levels of educational attainment are particularly strong among men between 30 and 44 years of age. The association between unemployment rates and educational attainment is similar among women, although the gap between upper secondary and tertiary attainment is even wider in many countries. The disadvantage for women is visible for one-third of countries, but the unemployment rates are similar in the others, independently of the levels of attainment. At the tertiary level, the gap is much less obvious, even in the countries where it is a general phenomenon (Chart A11.2).

A number of factors contribute to the variation between countries in the association between unemployment rates and educational attainment.

The wide variation between countries in unemployment rates observed among those with low educational attainment is attributable to a number of factors. In some countries (especially those facing a transition process: the Czech Republic, Hungary, Poland and the Slovak Republic), the high unemployment rates of the poorly educated reflect generally difficult labour market conditions, which affect these individuals in particular. To a lesser extent, this is also the case in Finland, France and Germany. Unemployment rates among those without an upper secondary qualification are also relatively high in some countries where labour markets are less regulated (Canada, the United Kingdom and the United States). On the other hand, in countries where agriculture is still an important sector of employment (Mexico and Portugal), unemployment rates of persons without upper secondary education tend to be low. Finally, where overall labour market conditions are particularly favourable (Austria, Iceland, Luxembourg, the Netherlands, Norway and Switzerland), jobs appear to be available for workers with low as well as high educational attainment (Table A11.2).

Definitions and methodologies

Data are derived from national labour force surveys.

The labour force participation rate for a particular age group is equal to the percentage of individuals in the population of the same age group who are either employed or unemployed, as defined according to the guidelines of the International Labour Office (ILO).

The unemployed are defined as individuals who are without work, actively seeking employment and currently available to start work. The employed are defined as those who during the survey reference week: *i)* work for pay (employees) or profit (self-employed and unpaid family workers) for at least one hour, or *ii)* have a job but are temporarily not at work (through injury, illness, holiday, strike or lock-out, educational or training leave, maternity or parental leave, etc.) and have a formal attachment to their job.

The unemployment rate is the number of unemployed persons divided by the number of labour force participants (expressed as a percentage). The level of educational attainment is based on the definitions of ISCED-97.

Table A11.1.

Labour force participation rates (2001)

By level of educational attainment and gender for 25 to 64-year-olds and 55 to 64-year-olds

OECD COUNTRIES

		25 to 64-year-olds					55 to 64-year-olds			
		Below upper secondary education	Upper secondary and post-secondary non-tertiary education	Tertiary-type B education	Tertiary-type A and advanced research programmes	All levels of education	Below upper secondary education	Upper secondary and post-secondary non-tertiary education	Tertiary education	All levels of education
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Australia	Males	79	89	89	92	86	54	67	74	62
	Females	55	68	77	83	66	30	42	61	38
Austria[1]	Males	71	85	87	95	83	32	41	65	42
	Females	49	68	83	86	64	15	18	43	17
Belgium[1]	Males	71	87	92	92	82	29	42	58	38
	Females	41	71	82	86	62	13	22	31	17
Canada	Males	73	88	91	90	86	52	64	66	61
	Females	48	73	81	83	72	28	46	51	41
Czech Republic	Males	70	88	x(4)	94	87	35	55	79	55
	Females	52	73	x(4)	83	70	13	27	61	25
Denmark	Males	75	87	91	96	86	55	65	81	66
	Females	57	79	88	90	77	31	60	67	52
Finland	Males	70	86	90	93	83	43	54	65	51
	Females	61	79	86	88	77	40	53	67	49
France	Males	76	88	92	92	85	36	44	66	44
	Females	57	76	85	84	70	29	36	51	34
Germany	Males	77	84	88	92	84	44	49	67	53
	Females	50	70	81	83	68	26	35	53	34
Greece	Males	82	88	85	90	85	60	48	57	57
	Females	40	57	79	83	52	25	16	30	24
Hungary	Males	50	83	x(4)	89	75	22	46	64	36
	Females	35	67	x(4)	79	58	8	21	43	16
Iceland	Males	95	95	97	98	96	91	92	99	93
	Females	85	84	91	95	87	81	83	82	82
Ireland	Males	79	93	95	94	87	61	72	80	66
	Females	40	64	74	85	60	21	35	50	29
Italy	Males	74	86	x(4)	91	80	36	49	71	41
	Females	34	67	x(4)	81	50	12	29	41	16
Japan	Males	87	95	98	97	95	80	86	86	84
	Females	56	63	66	68	63	48	49	47	49
Korea	Males	84	89	94	91	88	74	67	70	71
	Females	61	53	58	56	57	51	25	42	48
Luxembourg	Males	79	87	92	92	85	22	35	73	36
	Females	46	63	80	77	56	9	20	48	14
Mexico	Males	94	96	97	94	94	81	78	79	80
	Females	37	56	61	70	43	27	37	37	28
Netherlands[1]	Males	77	89	90	92	86	42	53	64	51
	Females	46	73	80	83	64	19	32	45	26
New Zealand	Males	80	91	89	93	89	66	79	80	75
	Females	56	74	77	83	71	41	58	65	52
Norway[1]	Males	75	89	95	94	89	62	75	87	74
	Females	59	80	88	89	80	47	63	86	62
Poland	Males	64	83	x(4)	92	81	35	41	68	41
	Females	45	71	x(4)	86	67	20	24	45	24
Portugal	Males	87	87	94	94	87	63	57	78	64
	Females	66	84	88	95	71	41	32	60	42
Slovak Republic	Males	62	88	89	93	86	25	46	64	43
	Females	43	76	90	88	71	3	12	52	11
Spain	Males	83	90	93	91	86	59	62	73	61
	Females	41	66	77	83	54	20	38	58	24
Sweden	Males	79	88	89	91	87	68	74	82	74
	Females	66	83	86	90	82	56	69	82	68
Switzerland	Males	87	93	96	96	94	78	82	85	83
	Females	62	74	85	86	74	41	58	68	54
Turkey	Males	82	87	x(4)	87	84	52	25	43	49
	Females	22	32	x(4)	71	27	14	5	15	14
United Kingdom	Males	67	88	93	93	86	51	67	73	64
	Females	51	77	85	87	74	44	65	69	58
United States	Males	75	86	90	92	87	55	66	77	68
	Females	52	73	80	81	73	33	54	66	54
Country mean	*Males*	*77*	*88*	*92*	*93*	*86*	*52*	*59*	*72*	*60*
	Females	*50*	*70*	*80*	*83*	*65*	*30*	*39*	*54*	*37*

Note: x indicates that data are included in another column. The column reference is shown in brackets after "x". *e.g.*, x(2) means that data are included in column 2.

1. Year of reference 2000.

Source: OECD. See Annex 3 for a description of ISCED-97 levels, ISCED-97 country mappings and national data sources (*www.oecd.org/els/education/eag2002*).

Table A11.2.
Unemployment rates (2001)
By level of educational attainment and gender of 25 to 64-year-olds and 30 to 44-year-olds

OECD COUNTRIES

		25 to 64-year-olds					30 to 44-year-olds			
		Below upper secondary education	Upper secondary and post-secondary non-tertiary education	Tertiary-type B education	Tertiary-type A and advanced research programmes	All levels of education	Below upper secondary education	Upper secondary and post-secondary non-tertiary education	Tertiary education	All levels of education
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Australia	Males	8.1	4.5	4.5	2.5	5.2	8.6	4.6	2.8	5.3
	Females	7.0	5.2	3.9	2.6	5.1	8.4	5.0	3.5	5.7
Austria[1]	Males	6.9	2.8	1.1	1.8	3.2	6.2	2.3	1.2	2.6
	Females	5.9	3.2	1.3	2.5	3.6	6.2	2.8	1.8	3.3
Belgium[1]	Males	7.7	3.9	2.2	2.4	4.8	8.1	3.2	2.2	4.5
	Females	13.5	7.0	3.0	3.3	7.4	14.8	7.6	2.7	7.6
Canada	Males	10.2	6.2	4.8	4.4	6.2	10.8	6.3	4.8	6.3
	Females	10.2	6.2	4.5	4.4	5.8	12.3	6.7	4.8	6.2
Czech Republic	Males	19.3	4.7	x(4)	1.9	5.4	23.4	4.5	1.8	5.3
	Females	19.1	8.0	x(4)	2.2	8.9	24.0	8.9	2.4	9.7
Denmark	Males	4.0	2.7	3.3	3.5	3.1	4.0	2.3	3.2	2.8
	Females	6.2	4.0	3.1	3.1	4.1	7.2	3.9	3.9	4.3
Finland	Males	10.5	7.9	4.7	3.0	7.2	11.9	7.1	2.8	6.5
	Females	12.7	9.2	5.9	3.6	8.1	15.0	9.8	5.3	8.2
France	Males	9.7	5.1	4.3	4.1	6.2	10.7	4.7	3.5	6.1
	Females	14.4	9.3	5.0	5.6	9.8	18.1	9.5	5.5	10.6
Germany	Males	15.6	8.1	4.4	3.4	7.7	14.2	7.0	2.6	6.5
	Females	11.5	8.4	5.8	4.4	8.1	11.2	7.4	4.4	7.2
Greece	Males	4.9	6.2	4.9	4.5	5.3	4.7	5.1	4.2	4.7
	Females	12.3	15.1	8.3	9.6	12.5	16.7	14.9	7.1	13.2
Hungary	Males	12.5	4.8	x(4)	1.1	5.5	15.1	4.6	0.7	5.6
	Females	7.6	4.2	x(4)	1.3	4.3	9.9	4.1	1.2	4.5
Iceland	Males	2.3	1.2	0.8	1.0	1.5	1.7	1.4	0.6	1.3
	Females	2.4	2.8	2.4	0.2	2.1	2.3	2.0	0.9	1.8
Ireland	Males	5.5	2.3	1.9	1.1	3.3	6.3	2.0	1.6	3.4
	Females	5.1	2.8	2.3	1.0	2.9	6.1	2.7	1.9	3.1
Italy	Males	6.9	4.9	x(4)	3.8	5.8	7.1	3.8	3.9	5.4
	Females	14.0	9.3	x(4)	7.2	10.7	16.8	8.9	6.1	11.1
Japan	Males	6.9	4.8	3.2	2.8	4.4	7.5	3.6	2.0	3.1
	Females	4.3	4.7	3.8	3.1	4.2	4.2	4.2	3.8	4.0
Korea	Males	4.3	3.7	5.0	3.2	3.8	4.9	3.5	2.7	3.4
	Females	1.8	2.7	3.3	2.0	2.3	2.5	2.4	1.9	2.3
Luxembourg	Males	1.5	0.7	0.9	1.1	1.1	1.0	0.6	1.2	0.9
	Females	2.3	1.5	0.4	2.6	1.9	2.1	2.0	1.6	2.0
Mexico	Males	1.4	1.9	2.1	2.2	1.6	1.3	1.2	2.0	1.5
	Females	1.4	1.6	1.8	2.2	1.6	1.3	1.7	1.7	1.5
Netherlands[1]	Males	3.0	1.6	1.5	1.8	2.0	3.0	1.4	1.6	1.9
	Females	5.0	3.1	2.6	2.1	3.4	5.7	3.1	1.7	3.4
New Zealand	Males	7.4	3.0	4.4	2.8	4.0	8.1	3.2	3.4	4.1
	Females	5.9	3.6	2.9	3.2	3.9	7.5	3.8	3.6	4.4
Norway[1]	Males	2.3	3.0	1.9	2.0	2.6	2.3	3.1	1.8	2.7
	Females	2.2	2.2	3.7	1.6	2.0	4.0	2.4	1.8	2.3
Poland	Males	21.7	14.0	x(4)	4.0	13.9	26.3	13.5	1.8	13.7
	Females	23.7	18.3	x(4)	5.9	17.0	31.9	19.3	3.4	18.1
Portugal	Males	2.7	3.1	2.6	2.0	2.7	2.4	3.0	1.4	2.4
	Females	4.6	3.3	2.9	3.3	4.3	5.0	2.8	1.9	4.2
Slovak Republic	Males	44.3	14.8	5.3	4.5	15.7	55.1	14.8	3.9	16.1
	Females	34.6	14.8	11.0	3.4	15.7	39.5	14.8	3.4	15.8
Spain	Males	7.3	5.4	4.1	4.7	6.2	7.6	4.6	3.4	5.8
	Females	16.1	12.8	13.0	8.8	13.3	18.1	12.7	8.6	13.5
Sweden	Males	5.6	5.0	3.4	2.6	4.5	6.3	4.7	2.9	4.3
	Females	6.4	4.2	2.5	2.2	3.8	7.0	4.3	2.7	3.9
Switzerland	Males	m	1.1	m	m	1.1	m	m	m	m
	Females	m	2.9	m	m	3.1	m	3.4	m	3.4
Turkey	Males	9.2	8.0	x(4)	5.6	8.6	9.3	5.5	3.4	7.9
	Females	6.9	13.5	x(4)	6.1	7.7	7.7	11.2	3.2	7.3
United Kingdom	Males	9.4	4.1	2.7	2.0	4.1	11.9	3.9	2.2	4.2
	Females	5.7	3.7	1.7	1.9	3.4	8.2	4.3	2.0	4.0
United States	Males	7.5	4.2	2.5	1.9	3.7	7.4	4.4	1.8	3.7
	Females	8.9	3.4	2.3	2.0	3.3	8.9	3.7	2.3	3.6
Country mean	*Males*	*8.9*	*4.8*	*3.3*	*2.8*	*5.0*	*9.9*	*4.5*	*2.4*	*4.9*
	Females	*9.4*	*6.4*	*4.0*	*3.5*	*6.1*	*11.1*	*6.3*	*3.3*	*6.3*

Note: x indicates that data are included in another column. The column reference is shown in brackets after "x". *e.g.*, x(2) means that data are included in column 2.
1. Year of reference 2000.
Source: OECD. See Annex 3 for a description of ISCED-97 levels, ISCED-97 country mappings and national data sources (*www.oecd.org/els/education/eag2002*).

A12

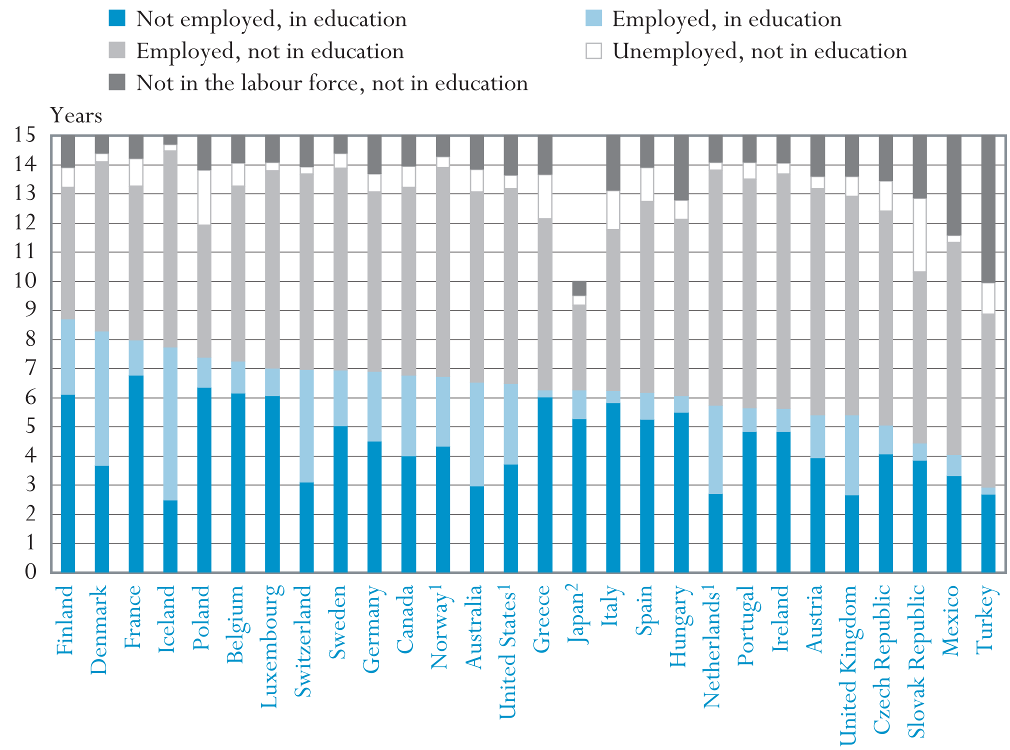
EXPECTED YEARS IN EDUCATION, EMPLOYMENT AND NON-EMPLOYMENT BETWEEN THE AGES OF 15 AND 29

- On average across countries, a young person aged 15 in 2001 can expect to be in education for a little over six years. In 12 of the 29 countries studied, the figure ranges from six to seven years.
- A young person aged 15 can expect to hold a job for 6.5 of the 15 years to come, to be unemployed for a total of 0.8 years and to be out of the labour market for 1.4 years. It is in the average duration of spells of unemployment that countries vary most, which primarily reflects differences in youth employment rates.
- In absolute terms, young people today can expect to spend less time in unemployment after completing their initial education than they did ten years ago.

Chart A12.1.

Expected years in education and not in education (2001)

By work status for 15 to 29-year-olds



1. Year of reference 2000.
2. Data refer to 15 to 24-year-olds.

Countries are ranked in descending order of the expected years in education of the youth population.

Source: OECD. Table A12.1. See Annex 3 for national data sources *(www.oecd.org/els/education/eag2002)*.

Policy context

This indicator shows the expected years young people spend in education, employment and non-employment.

During the past decade, young people have spent longer in initial education, with the result that they delay their entry into the world of work (see the 1998 edition of *Education at a Glance*). Some of this additional time is spent combining work and education, a practice that is widespread in some countries. Once young people have completed their education, access to the labour market is often impeded by spells of unemployment or non-employment, although this situation affects men and women differently. In absolute terms, however, young people today can expect to spend less time in unemployment after completing initial education than they did ten years ago.

Evidence and explanations

On the basis of the current situation of persons between the ages of 15 and 29, this indicator gives a picture of the major trends affecting the transition from school to work.

On average, a 15-year-old can expect to be in the education system for about another six years.

On average, a young person aged 15 in 2001 can expect to be in education for a little over six years (Table A12.1). Between 1985 and 1996, this figure rose by almost 1.5 years. Since 1996, the overall increase has been slower. Countries where young people used to spend relatively little time in education have made up some ground, whereas those in which they stayed in education longest are now recording little increase.

In 12 of the 28 countries studied, a 15-year-old can expect to spend from six to seven years in education. There is, however, a gap of around four years separating the two extreme groups: Denmark, Finland, Iceland and France (eight years on average) on the one hand and Mexico, the Slovak Republic and Turkey (four years on average) on the other.

The average overall figure is marginally higher for women (6.4 compared with 6.2 years). In many countries, the figures are about the same, but Turkey stands out as an exception, with only 2.4 years of expected education for young women aged 15 years. At the other end of the scale, a longer average period of education often goes hand in hand with a relatively higher average for women (Table A12.1).

The figure for expected years of education covers some very different combinations of education and work.

The figure for expected years of education covers some very different combinations of education and work. Employment combined with education includes work-study programmes and part-time jobs. While such combinations are rare in half of the countries studied, in the other half they account for between one and four of the additional six to seven years that young people expect to spend in education.

In addition to the average six years spent in education, a young person aged 15 can expect to hold a job for 6.5 of the 15 years to come, to be unemployed for a total of 0.8 years and to be out of the labour market for 1.4 years, neither in education nor seeking work. It is worth noting that, in absolute terms, young people can expect to spend less time in unemployment after completion of initial education than they could ten years ago.

Today a 15-year-old can expect to hold a job for 6.5 years, to be unemployed for almost one year and to be out of the labour force for 1.3 years until the age of 29.

It is in the average duration of spells of unemployment that countries vary most, which mainly reflects differences in youth employment rates. The cumulative average duration of unemployment is four months or below in Denmark, Iceland, Luxembourg, Mexico, the Netherlands and Switzerland, but more than 18 months in Greece, Poland, the Slovak Republic and Turkey.

By and large, men and women differ very little in terms of the expected number of years in unemployment. However, while the situation is similar for both genders in many countries, women appear to be at a disadvantage in Greece, Portugal and Spain and at an advantage in Australia, Canada, Germany, Hungary, the Slovak Republic, Turkey and the United Kingdom. In some of the latter countries, however, notably in Australia, the United Kingdom, and in particular Turkey, the lower expectancy for women is largely influenced by the fact that many women leave the labour market, thereby reducing pressure on jobs.

Whereas young men can expect to spend little more than six months neither in education nor in the labour force between the ages of 15 and 29, the average figure for women is near two years. In the Nordic countries (Iceland, Finland and Sweden), young men and young women do not differ in this measure. Conversely, in the Czech Republic, Hungary, Mexico and Turkey there is a much stronger tendency for young women to leave the labour market. In all of the other countries, women between the ages of 15 and 29 spend an average of about one year more than men outside the labour market.

Definitions and methodologies

The statistics presented here are calculated from labour force survey data on age-specific proportions of young people in each of the specified categories. These proportions are then totalled over the 15 to 29 age group to yield the expected number of years spent in various situations. The calculation thus assumes that young persons currently aged 15 years will show the same pattern of education and work between the ages of 15 and 29 as the population between those age limits in the given data year.

Data are derived from national labour force surveys.

Persons in education may include those attending part-time as well as full-time. The definitions of the various labour force statuses are based on the ILO guidelines, except for the category 'youth in education and employed', which includes all work-study programmes whatever their classification according to the ILO guidelines. The data for this indicator were obtained from a special collection with a reference period in the early part of the calendar year, usually the first quarter or the average of the first three months.

Table A12.1.
Expected years in education and not in education for 15 to 29-year-olds, by gender and work status (2001)

		Expected years in education			Expected years not in education			
		Not employed	Employed (including work study programmes)	Sub-total	Employed	Unemployed	Not in the labour force	Sub-total
OECD COUNTRIES								
Australia	Males	3.0	3.6	6.6	6.9	0.9	0.5	8.4
	Females	2.9	3.5	6.4	6.1	0.7	1.8	8.6
	M+F	3.0	3.5	6.5	6.5	0.8	1.2	8.5
Austria	Males	3.6	1.8	5.4	7.9	0.5	1.3	9.6
	Females	4.3	1.1	5.4	7.6	0.4	1.6	9.6
	M+F	3.9	1.5	5.4	7.7	0.4	1.4	9.6
Belgium	Males	5.9	1.3	7.3	6.4	0.8	0.5	7.7
	Females	6.4	0.8	7.2	5.6	0.8	1.4	7.8
	M+F	6.2	1.1	7.2	6.0	0.8	0.9	7.8
Canada	Males	4.0	2.5	6.5	6.8	1.0	0.7	8.5
	Females	4.0	3.0	7.0	6.0	0.5	1.4	8.0
	M+F	4.0	2.8	6.8	6.4	0.8	1.0	8.2
Czech Republic	Males	3.7	1.2	5.0	8.6	1.1	0.3	10.0
	Females	4.4	0.7	5.1	6.0	1.1	2.8	9.9
	M+F	4.1	1.0	5.1	7.3	1.1	1.6	9.9
Denmark	Males	3.4	4.7	8.1	6.2	0.3	0.3	6.9
	Females	4.0	4.5	8.4	5.3	0.3	0.9	6.6
	M+F	3.7	4.6	8.3	5.8	0.3	0.6	6.7
Finland	Males	5.8	2.3	8.1	5.0	0.7	1.1	6.9
	Females	6.3	2.8	9.1	3.9	0.7	1.2	5.9
	M+F	6.1	2.6	8.6	4.5	0.7	1.2	6.4
France	Males	6.6	1.3	7.8	5.9	0.9	0.3	7.2
	Females	7.0	1.2	8.1	4.6	1.0	1.2	6.9
	M+F	6.8	1.2	8.0	5.3	1.0	0.8	7.0
Germany	Males	4.4	2.5	6.9	6.6	0.8	0.8	8.1
	Females	4.6	2.3	6.9	5.7	0.5	1.9	8.1
	M+F	4.5	2.4	6.9	6.1	0.6	1.3	8.1
Greece	Males	6.0	0.3	6.2	6.9	1.3	0.6	8.8
	Females	6.1	0.2	6.3	4.8	1.8	2.1	8.7
	M+F	6.0	0.2	6.3	5.8	1.6	1.3	8.7
Hungary	Males	5.4	0.6	5.9	7.0	0.9	1.2	9.1
	Females	5.6	0.6	6.2	5.1	0.5	3.2	8.8
	M+F	5.5	0.6	6.1	6.0	0.7	2.2	8.9
Iceland	Males	2.6	5.8	8.4	5.8	0.2	0.5	6.6
	Females	2.3	4.7	7.1	7.6	0.3	0.1	7.9
	M+F	2.5	5.2	7.7	6.7	0.3	0.3	7.3
Ireland	Males	4.5	0.7	5.2	8.8	0.5	0.5	9.8
	Females	5.2	0.9	6.0	7.2	0.3	1.4	9.0
	M+F	4.8	0.8	5.6	8.0	0.4	0.9	9.4
Italy	Males	5.6	0.4	6.0	6.4	1.3	1.3	9.0
	Females	6.1	0.4	6.5	4.6	1.4	2.5	8.5
	M+F	5.8	0.4	6.2	5.5	1.4	1.9	8.8
Japan[1]	Males	5.6	1.0	6.6	2.8	0.4	0.3	3.4
	Females	5.0	0.9	5.9	3.0	0.4	0.7	4.1
	M+F	5.3	1.0	6.3	2.9	0.4	0.5	3.7
Luxembourg	Males	6.1	1.1	7.2	7.1	0.4	0.4	7.8
	Females	6.1	0.8	6.8	6.4	0.2	1.5	8.2
	M+F	6.1	0.9	7.0	6.8	0.3	0.9	8.0
Mexico	Males	3.3	0.9	4.2	9.9	0.3	0.6	10.8
	Females	3.3	0.5	3.9	4.9	0.2	6.1	11.1
	M+F	3.3	0.7	4.0	7.3	0.3	3.4	11.0
Netherlands[2]	Males	2.7	3.1	5.8	8.5	0.3	0.5	9.2
	Females	2.7	3.0	5.7	7.6	0.3	1.4	9.3
	M+F	2.7	3.0	5.7	8.0	0.3	0.9	9.3
Norway[2]	Males	4.1	2.0	6.1	7.9	0.5	0.5	8.9
	Females	4.6	2.8	7.3	6.4	0.3	1.0	7.7
	M+F	4.3	2.4	6.7	7.2	0.4	0.7	8.3
Poland	Males	6.2	1.0	7.2	5.2	2.0	0.6	7.8
	Females	6.5	1.0	7.5	3.8	1.9	1.8	7.5
	M+F	6.4	1.0	7.4	4.5	1.9	1.2	7.6
Portugal	Males	4.5	0.8	5.3	8.7	0.4	0.6	9.7
	Females	5.2	0.8	6.0	7.0	0.7	1.3	9.0
	M+F	4.8	0.8	5.6	7.8	0.6	0.9	9.4
Slovak Republic	Males	3.6	0.8	4.3	6.2	3.0	1.5	10.7
	Females	4.1	0.4	4.5	5.5	2.1	2.9	10.5
	M+F	3.8	0.6	4.4	5.9	2.6	2.2	10.6
Spain	Males	4.8	0.9	5.7	7.7	1.0	0.6	9.3
	Females	5.7	1.0	6.7	5.3	1.3	1.6	8.3
	M+F	5.2	0.9	6.2	6.5	1.2	1.1	8.8
Sweden	Males	4.9	1.7	6.6	7.3	0.6	0.5	8.4
	Females	5.2	2.1	7.3	6.5	0.5	0.7	7.7
	M+F	5.0	1.9	6.9	6.9	0.5	0.6	8.1
Switzerland	Males	3.0	4.3	7.3	6.7	0.2	0.8	7.7
	Females	3.2	3.4	6.6	6.7	0.3	1.4	8.4
	M+F	3.1	3.9	7.0	6.7	0.3	1.1	8.0
Turkey	Males	3.1	0.3	3.4	8.2	1.5	1.9	11.6
	Females	2.3	0.2	2.4	3.4	0.6	8.6	12.6
	M+F	2.7	0.2	2.9	5.9	1.1	5.0	12.1
United Kingdom	Males	2.6	2.6	5.2	8.3	0.9	0.7	9.8
	Females	2.7	2.9	5.6	6.7	0.5	2.2	9.4
	M+F	2.7	2.7	5.4	7.5	0.7	1.4	9.6
United States[2]	Males	3.8	2.6	6.4	7.3	0.5	0.8	8.6
	Females	3.7	2.9	6.6	6.1	0.4	1.9	8.4
	M+F	3.7	2.8	6.5	6.7	0.5	1.4	8.5
Country mean	*Males*	*4.3*	*1.9*	*6.2*	*7.2*	*0.8*	*0.7*	*8.8*
	Females	*4.6*	*1.8*	*6.4*	*5.8*	*0.7*	*2.1*	*8.6*
	M+F	*4.5*	*1.8*	*6.3*	*6.5*	*0.8*	*1.4*	*8.7*

1. Data refer to 15 to 24-year-olds.
2. Year of reference 2000.
Source: OECD. See Annex 3 for national data sources (*www.oecd.org/els/education/eag2002*).

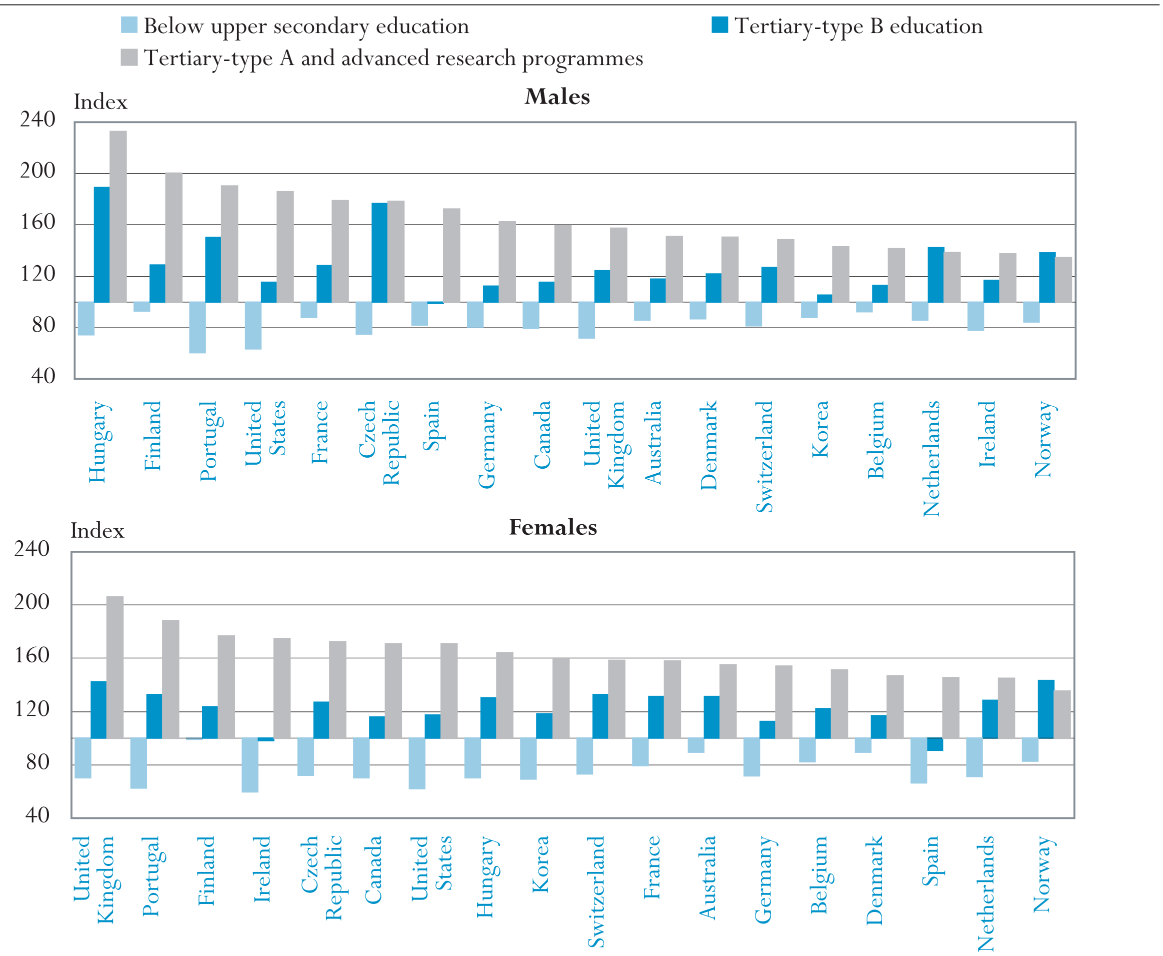
THE RETURNS TO EDUCATION: PRIVATE AND SOCIAL RATES OF RETURN TO EDUCATION AND THEIR DETERMINANTS

- Education and earnings are positively linked. Upper secondary and post-secondary non-tertiary education form a break point in many countries beyond which additional education attracts a particularly high premium. In all countries, graduates of tertiary-level education earn substantially more than upper secondary and post-secondary non-tertiary graduates. Earnings differentials between tertiary and upper secondary education are generally more pronounced than those between upper secondary and lower secondary or below.
- Earnings of people with below upper secondary education tend to be 60 to 90 per cent of those of upper secondary and post-secondary non-tertiary graduates.
- Women still earn less than men with similar levels of educational attainment.

Chart A13.1.

Relative earnings with income from employment (2001)

By level of educational attainment and gender for 25 to 64-year-olds (upper secondary and post-secondary non-tertiary education =100)



Countries are ranked in descending order of relative earnings for the population having attained the level of tertiary-type A and advanced research programmes.
Source: OECD. Table A13.1. See Annex 3 for national data sources *(www.oecd.org/els/education/eag2002)*.

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Policy context

This indicator examines the earnings of workers with differing educational attainment…

One way in which markets provide incentives for individuals to develop and maintain appropriate levels of skills is through wage differentials, in particular through the enhanced earnings accorded to persons completing additional education. The pursuit of higher levels of education can also be viewed as an investment in human capital. Human capital includes the stock of skills that individuals maintain or develop, usually through education or training, and then offer in return for earnings in the labour market. The higher the earnings that result from increases in human capital, the higher the returns on that investment and the premium paid for enhanced skills and/or for higher productivity.

…as well as the returns to educational investment and the various costs and benefits influencing them.

At the same time, education involves costs which need to be considered when examining the returns to investment in education. This indicator examines the returns and the various costs and benefits that influence them.

Evidence and explanations

Education and earnings

Earnings differentials are a measure of the current financial incentives in a particular country for an individual to invest in further education.

Earnings differentials according to educational attainment are a measure of the current financial incentives in a particular country for an individual to invest in further education. Earnings differentials may also reflect differences in the supply of educational programmes at different levels or the barriers in access to those programmes. The earnings benefit of completing tertiary education can be seen by comparing the ratio of the mean annual earnings of those who graduated from tertiary education with the mean annual earnings of upper secondary and post-secondary non-tertiary graduates. The earnings disadvantage from not completing upper secondary or post-secondary non-tertiary education is apparent from a similar comparison. Variations in relative earnings (before taxes) between countries reflect a number of factors, including skill demands in the labour force, minimum wage legislation, the strength of unions, the coverage of collective bargaining agreements, the supply of workers at the various levels of educational attainment, the range of work experience of workers with high and low educational attainment, the distribution of employment between occupations and the relative incidence of part-time and part-year work among workers with varying levels of educational attainment.

Education and earnings are positively linked, whatever the type of socio-economic system or the degree of economic development.

Chart A13.1 shows a strong positive relationship between educational attainment and earnings. In all countries, graduates of tertiary-level education earn substantially more than upper secondary and post-secondary non-tertiary graduates. Earnings differentials between tertiary and upper secondary and post-secondary non-tertiary education are generally more pronounced than those between upper secondary and lower secondary or below, suggesting that upper secondary and post-secondary non-tertiary education form a break-point in many countries, beyond which additional education attracts a particularly high premium. Among those countries which report gross earnings, the earnings premium for males aged 25 to 64 years with tertiary-level education ranges from 33 per cent or less in Italy, New Zealand and Norway, to 80 per cent or more in the Czech Republic, Finland, Hungary and Portugal.

The earnings data shown in this indicator differ between countries in a number of ways. Caution should therefore be exercised in interpreting the results. In particular, in countries reporting annual earnings, differences in the incidence of part-year work among individuals with different levels of educational attainment will have an effect on relative earnings that is not reflected in the data for countries reporting weekly or monthly earnings (see definitions below).

Education and gender disparity in earnings

Tertiary education enhances earnings relative to upper secondary and post-secondary non-tertiary education more for females than for males in Australia, Belgium, Canada, Ireland, Korea, the Netherlands, New Zealand, Norway, Switzerland and the United Kingdom, whereas the reverse is true in the remaining countries (Table A13.1).

Earnings differentials between males and females with the same educational attainment remain substantial…

Although both males and females with upper secondary, post-secondary non-tertiary or tertiary attainment have substantial earnings advantages compared with those of the same gender who do not complete upper secondary education, earnings differentials between males and females with the same educational attainment remain substantial, reinforced by the frequency of part-time work for females.

When all levels of education are taken together, the earnings of females between 30 and 44 range from less than 55 per cent of those of males in Switzerland and the United Kingdom to over 75 per cent of those of males in Hungary and Spain (Table A13.2).

…with some of the differences explained by career and occupational choices, the amount of time that males and females spend in the labour force, and the relatively high incidence of part-time work among females.

Some of the gap in earnings between males and females may be explained by different choices of career and occupation, differences in the amount of time that males and females spend in the labour force, and the relatively high incidence of part-time work among females. Furthermore, earnings data by age suggest that there may be a movement towards more equality of average earnings between males and females across all levels of education, a result which might also be influenced by the increased proportion of females among younger tertiary graduates. In six out of 20 countries, the ratio of female to male earnings at the tertiary-type A and advanced research programmes levels is at least 10 percentage points higher among 30 to 44-year-olds than among 55 to 64-year-olds (Table A13.2).

Private internal rates of return to investment in education

The overall incentives to invest in human capital that are embedded in labour market benefits and financing arrangements can be summarised in estimates of the private internal rates of return (Chart A13.2 and Table A13.3). The rate of return represents a measure of the returns obtained, over time, relative to the cost of the initial investment in education. It is expressed as a percentage

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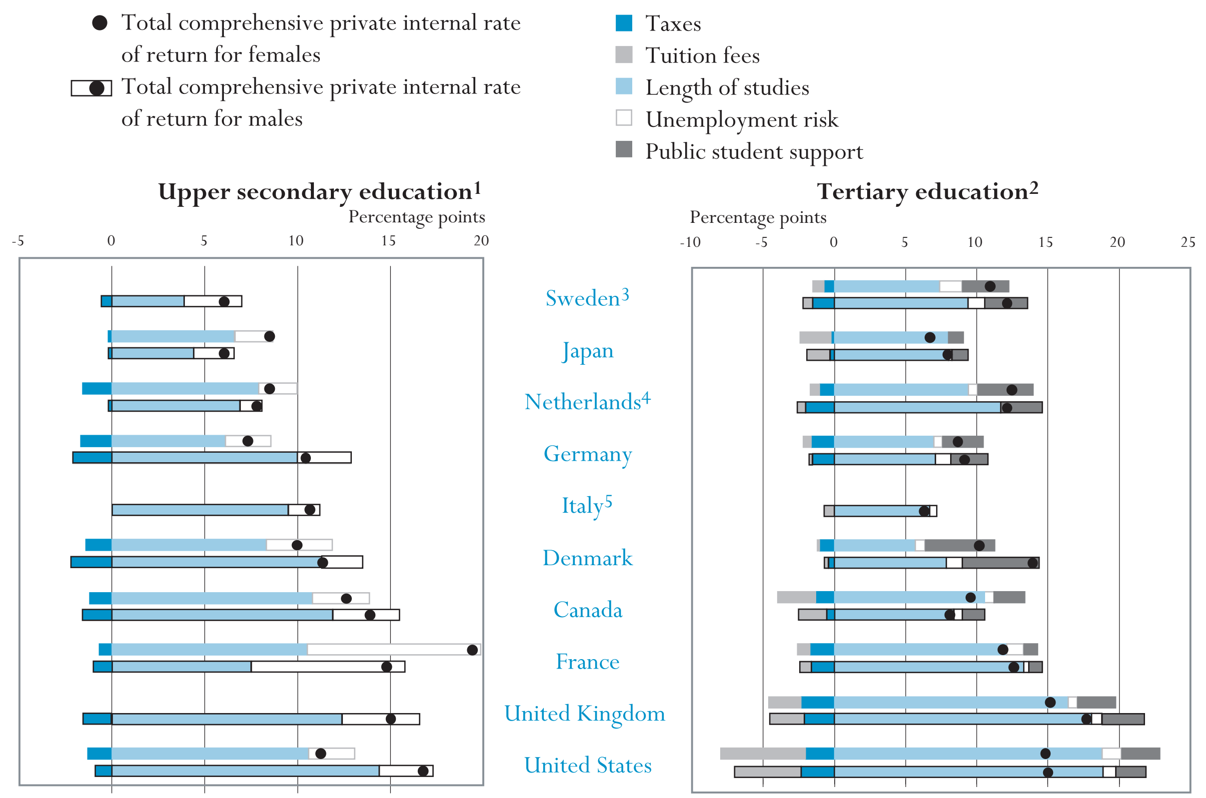
and is analogous to percentage returns from investing in a savings account (see Annex 3 for an explanation of the methodology at *www.oecd.org/els/education/eag2002*). In its most comprehensive form, the costs equal tuition fees, foregone earnings net of taxes adjusted for the probability of being in employment less the resources made available to students in the form of grants and loans. The benefits are the gains in post-tax earnings adjusted for higher employment probability less the repayment, if any, of public support during the period of study. The calculations assume that the student is full-time in education and has no work activity, hence no earnings while studying. The calculated rates of

Chart A13.2.

Comprehensive private internal rates of return to education (1999-2000)

Impact of length of studies, taxes, unemployment risk, tuition fees and public student support in upper secondary and tertiary education, by gender (in percentage points)



1. The rate of return to upper secondary education is calculated by comparing the benifits and costs with those of lower secondary education.
2. The rate of return to tertiary education is calculated by comparing the benifits and costs with those of upper secondary education.
3. In tertiary education, the theoretical length of standard tertiary courses is used in the calculations rather than the average theoretical length of different programmes for men and women. For women, earnings differentials between upper and lower secondary levels are not large enough to permit a positive rate of return calculation.
4. Year of reference 1997.
5. Data for males derive from 1998 post-tax earnings data.

Countries are ranked in descending order of the total comprehensive rates of return to education of males in upper secondary education.

Source: OECD. Table A13.3.

return are, however, likely to be biased upwards as unemployment, retirement and early retirement benefits are not taken into account. The rate-of-return calculations reported in this indicator do not take into account the non-monetary benefits of education.

In all countries, the private rate of return is higher than real interest rates, and often significantly so.

The estimated private internal rates of return to upper secondary and university education differ significantly across the countries listed in Table A13.3 but are in all cases higher than the real interest rate, and often significantly so, suggesting that human capital investment is an attractive way for the average person to build up wealth. For tertiary studies, three groups of countries can be identified depending on the estimated values of the internal rate of return, which includes the combined effect of earnings, length of studies, taxation, unemployment risk, tuition fees and public student support.

- First, with its very high rewards from tertiary education, the United Kingdom is in a group of its own.
- Second, Denmark, France, the Netherlands, Sweden and the United States have relatively high internal rates of return, ranging from 10 to 15 per cent.
- Third, in the remaining countries, rates are below 10 per cent, with the lowest rates recorded for Italy and Japan.

For upper secondary education, the internal rate is calculated to exceed 10 per cent in countries listed in Table A13.3 with the exceptions of Germany (females), Japan, the Netherlands and Sweden.

At the tertiary level, the gender differential in rates of return calculations is limited in most countries. However, at the upper secondary level, gender differences are more marked in Germany and in the United States with returns cut by one-quarter to one-third for females, due to relatively narrow earnings differentials.

Earnings differentials and the length of education tend to be the prime determinants of the returns…

As can be seen from Table A13.3, earnings differentials and the length of education are generally the prime determinants of the private internal rates of return. Thus, countries with strong overall incentives to invest in human capital are typically characterised by high education-earnings differentials and/or relatively short education programmes, and *vice versa*. The calculated high rates of return to tertiary education in the United Kingdom, for example, are to an important extent due to relatively short standard university studies, whereas the low rates of return in Germany are strongly influenced by comparatively long study periods. Indeed, if the average length of tertiary studies were shortened by one year without compromising quality, the internal rate of return for males in the countries under review would increase by 1 to 5 percentage points, if all other factors were held constant. To put such a hypothetical shortening of tertiary studies into perspective, it should be noted that to achieve the same increase via wider wage differentiation would require an increase in the tertiary wage premium by 5 to 14 percentage points.

There are, however, notable exceptions to this general pattern. Despite narrow wage differentials and long study periods, Denmark and, to a lesser extent, Sweden offer comparatively strong incentives to acquire university education. And France has strong incentives for young people to invest in upper secondary education despite relatively small wage gains compared to the length of such education.

…but there are other factors, including…

The contribution of the various factors to the difference between the narrow internal rate of return, comprising only earnings differentials and the length of education, and the comprehensive rate can be evaluated by adding them successively to the rate-of-return formula:

…taxes, which reduce the returns,…

- *Taxes* reduce the internal rate of return derived from pre-tax earnings and study periods by 1.3 percentage points on average for tertiary education and 1.1 percentage point for upper secondary education in the countries under review. At the tertiary level, the impact of taxes is particularly strong in the United Kingdom and in the United States, mainly reflecting large education-earnings differentials combined with progressive tax systems, but also in the Netherlands and France. At the upper secondary level, the depressing effect of the tax system is most notable in Germany, due to the strong degree of progressivity of the tax system over the relevant earnings range, and in Denmark, while it is the smallest in Japan.

…lower risks of unemployment, which increase the returns,…

- *Unemployment* risk differentials increase the internal rate of return compared with rates based only on pre-tax earnings and the length of study. Reflecting the large differential in unemployment rates between people with lower and upper secondary education, the increase in the internal rate is particularly large for upper secondary education, averaging 3.6 percentage points for males and females for the countries under review. The relatively high unemployment differential in France adds as much as 8.3 to 9.4 percentage points to the internal rate of return. For tertiary education, the differential employment prospects have much less effect on the rates of return, adding on average 0.7 to 0.9 percentage points for males and females, respectively, in the countries included in Table A13.3.

…tuition fees, which reduce the returns…

- *Tuition fees* have a particularly important negative impact on rates of return to tertiary education in the United States, and, to a lesser extent, in Canada and the United Kingdom. In the continental European countries, the impact is significantly smaller due to the much lower level of tuition fees.

…and public grant or loan arrangements, which boost returns.

- *Public student grant and loan arrangements* at the tertiary level give a significant boost to incentives, averaging 2.5 to 3 percentage points in the countries under review, compared with rates of returns excluding such support. The impact is particularly strong in Denmark, the Netherlands and Sweden, while it is weak in France, and absent in Italy.

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Social rates of return of investment in education

The benefits to society of additional education can be assessed on the basis of social rates of return. The social internal rate of return needs to reflect the costs and benefits to society of investment in education, which can differ significantly from private costs and benefits. The social cost includes the opportunity cost of having people not participating in the production of output and the full cost of the provision of education rather than only the cost borne by the individual. The social benefit includes the increased productivity associated with the investment in education and a host of possible non-economic benefits, such as lower crime, better health, more social cohesion and more informed and effective citizens. While data on social costs are available for most OECD countries, information about the full range of social benefits is less readily available. To the extent that productivity gains are reflected in labour cost differentials, the latter can be used as a measure of the economic gains for society of education activity. However, the possibility of externalities associated with education suggests that the observed earnings differentials might not fully account for the economy-wide efficiency gains. On the other hand, studies suggest that a (small) part of the wage premia received by better educated individuals is due to educational attainments, signalling inherent abilities to employers rather than productivity differentials due to investment in human capital. And while the non-economic benefits of education are found to be important, it is often difficult to translate them into monetary values for inclusion in rate-of-return calculations.

The benefits to society of additional education can be assessed on the basis of a social rate of return…

In view of the difficulty of constructing comprehensive social rates of return, Table A13.4 presents estimates of a "narrow" definition that abstracts from any externality effects and non-economic benefits. To the extent that there are sizeable positive externalities related to human capital investment by the average student, these estimates will thus be biased downwards.

…which can, however, currently only be estimated in a narrow sense excluding non-economic benefits.

The estimates suggest that the social internal rate of return is particularly high at both the upper secondary and tertiary levels in the United Kingdom and the United States , while it is the lowest in Denmark at both of these education levels. In France, it is moderate for upper secondary education but comparatively high at the tertiary level.

Social returns are still well above risk-free real interest rates, but tend to be lower than private returns, due to the significant social costs of education.

Primarily reflecting that the social cost of education is typically much higher than the private cost, the "narrow" social internal rates of return are significantly lower than the private internal rates of return. At the tertiary level, the differences are particularly large in Denmark and Sweden, with gaps ranging from 4 to almost 7.5 percentage points. At the upper secondary level, differentials between the private and social rates of return are notably wide in France, but comparatively small in Germany and the Netherlands.

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The interpretation of the internal rates of return

The high rates of return can be interpreted as indicating…

The private and social internal rates of return reported above are generally well above the risk-free real interest rate. Given that the return on human capital accumulation is subject to considerable uncertainty (as indicated by the wide dispersion of earnings among the better educated), investors are likely to require a compensating risk premium. However, the size of the premium of the internal rates of return over the real interest rate is higher than would seem to be warranted by considerations of risk alone. The high internal rates of return can be interpreted in two different ways.

…a disequilibrium in the market for educated workers, which calls for increasing educational capacity…

One interpretation is that the high rates indicate a serious shortage of better-educated workers driving up their earnings. This might imply a transitory situation, where high returns to education would subsequently generate enough supply response to push the rates into line with returns available on other productive assets. However, the adjustment period could be protracted and the speed of adjustment would depend largely on the capacity of the education system to respond to the derived increase in demand and the capacity of the labour market to absorb the changing relative supplies of labour. The re-balancing mechanism could also be accelerated by better availability of information to students about the returns to different courses of study, thereby helping them to make more informed choices.

…or significantly lower marginal returns than average returns…

Part of the high returns may also be compatible with market equilibrium. This would be the case if the marginal rates are significantly lower than the average rates. The marginal rate would indeed be lower than the average rate if the students at the margin are of lower ability and motivation than the average students, and thus unlikely to be able to command the average wage premium. According to this interpretation, the high internal rates of return would partly reflect economic rents on a scarce resource, namely ability and motivation.

…which would lessen the case for public intervention.

If the returns to education at the margin are lower, the case for public intervention to stimulate human capital accumulation is lessened if the quality of the marginal student cannot be improved. On the other hand, to the extent that the education system can improve cognitive and non-cognitive skills of young people, education policy could make a significant contribution to efficiency and equity in the longer run.

Definitions and methodologies

Data are derived from national labour force surveys and other surveys.

Relative earnings from employment are defined as the mean earnings (income from work before taxes) of persons at a given level of educational attainment divided by the mean earnings of persons with upper secondary education. This ratio is then multiplied by 100. The estimates are restricted to individuals with income from employment during the reference period.

Earnings data in Table A13.1 are annual for most countries but for France, Spain and Switzerland they are monthly. In Belgium and France, data cover the earnings of employees only. The Spanish data exclude people who work fewer than fifteen hours a week. The observed differences in relative earnings between countries therefore reflect variations not only in wage rates but also in coverage, in the number of weeks worked per year and in hours worked per week. Since lower educational attainment is associated with fewer hours of work (in particular with part-time work) and with less stable employment (more likelihood of temporary employment or more susceptibility to unemployment over the course of a year), the relative earnings charts shown for higher educational attainment in the tables and charts will be greater than what would be evident from an examination of relative rates of pay. The observed differences in relative earnings of males and females within a country can likewise be affected by some of these factors.

For the methods employed for the calculation of the rates of return in Tables A13.3 and A13.4, see Annex 3 at *www.oecd.org/els/education/eag2002*.

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Table A13.1.

Relative earnings of the population with income from employment

By level of educational attainment and gender for 25 to 64-year-olds and 30 to 44-year-olds (upper secondary and post-secondary non-tertiary education = 100)

			Below upper secondary education		Tertiary-type B education		Tertiary-type A and advanced research programmes		Tertiary education	
			25-64	30-44	25-64	30-44	25-64	30-44	25-64	30-44
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
OECD COUNTRIES										
Australia	1999	Males	86	83	118	120	151	149	139	139
		Females	89	88	131	130	155	155	146	146
		M+F	80	78	116	115	144	143	134	133
Belgium	2000	Males	93	x(1)	113	x(3)	141	x(5)	128	x(7)
		Females	82	x(1)	122	x(3)	151	x(5)	132	x(7)
		M+F	92	x(1)	112	x(3)	146	x(5)	128	x(7)
Canada	1999	Males	79	78	116	117	159	159	137	137
		Females	70	69	116	118	171	189	140	148
		M+F	79	79	112	113	162	167	135	138
Czech Republic	1999	Males	75	77	177	182	178	176	178	177
		Females	72	75	127	124	172	176	170	174
		M+F	68	70	151	151	180	182	179	181
Denmark	1999	Males	87	85	122	118	150	145	133	129
		Females	90	90	117	112	147	146	123	120
		M+F	86	85	112	108	151	146	124	120
Finland	1999	Males	93	90	129	125	200	188	167	159
		Females	99	96	124	123	176	172	145	141
		M+F	96	94	120	115	190	179	153	144
France	1999	Males	88	86	128	137	178	181	159	163
		Females	79	81	131	139	158	165	145	152
		M+F	84	84	125	133	169	174	150	155
Germany	2000	Males	80	87	112	110	162	160	141	139
		Females	72	71	113	114	154	153	137	137
		M+F	75	78	115	114	163	160	143	141
Hungary	2001	Males	75	76	189	170	233	237	232	237
		Females	71	74	130	119	164	163	164	162
		M+F	71	73	151	136	194	191	194	190
Ireland	1998	Males	78	84	117	126	137	143	131	136
		Females	59	60	98	83	175	170	145	136
		M+F	79	81	111	117	157	157	142	140
Italy	1998	Males	54	55	x(5)	x(6)	138	142	138	142
		Females	61	56	x(5)	x(6)	115	114	115	114
		M+F	58	57	x(5)	x(6)	127	126	127	126
Korea	1998	Males	88	90	105	109	143	136	132	129
		Females	69	75	118	138	160	181	141	164
		M+F	78	80	106	113	147	142	135	134
Netherlands	1997	Males	86	85	142	128	138	130	139	130
		Females	71	71	128	133	145	150	143	148
		M+F	83	83	136	129	141	136	141	135
New Zealand	2001	Males	76	74	x(7)	x(8)	x(7)	x(8)	130	122
		Females	72	72	x(7)	x(8)	x(7)	x(8)	136	135
		M+F	74	75	x(7)	x(8)	x(7)	x(8)	133	128
Norway	1999	Males	85	88	138	141	134	136	135	137
		Females	83	87	144	150	135	137	135	138
		M+F	84	89	153	153	131	131	133	133
Portugal	1999	Males	60	57	150	155	190	194	180	185
		Females	63	58	133	139	188	206	170	185
		M+F	62	58	141	146	192	202	178	187
Spain	1998	Males	82	76	99	103	172	155	152	138
		Females	66	56	91	89	145	138	137	130
		M+F	80	72	99	101	157	144	144	133
Sweden	1999	Males	87	86	x(7)	x(8)	x(7)	x(8)	138	140
		Females	88	87	x(7)	x(8)	x(7)	x(8)	126	122
		M+F	89	88	x(7)	x(8)	x(7)	x(8)	131	131
Switzerland	2001	Males	81	81	127	128	148	144	139	138
		Females	73	74	133	142	158	167	150	158
		M+F	78	78	144	147	164	162	157	156
United Kingdom	2001	Males	72	67	124	126	157	162	147	151
		Females	70	74	142	133	206	216	183	183
		M+F	67	68	128	124	174	181	159	161
United States	2001	Males	64	63	116	115	186	183	178	175
		Females	62	61	117	119	171	173	164	166
		M+F	65	64	114	113	181	178	172	169

Note: x indicates that data are included in another column. The column reference is shown in brackets after "x". *e.g.*, x(2) means that data are included in column 2.
Source: OECD. See Annex 3 for national data sources (*www.oecd.org/els/education/eag2002*).

Table A13.2.
Differences in earnings between women and men
Average annual earnings of women as a percentage of men by level of educational attainment of 30 to 44-year-olds and 55 to 64-year-olds

OECD COUNTRIES		Below upper secondary education		Upper secondary and post-secondary non-tertiary education		Tertiary-type B education		Tertiary-type A and advanced research programmes		All levels of education	
		30-44	55-64	30-44	55-64	30-44	55-64	30-44	55-64	30-44	55-64
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Australia	1999	66	67	63	75	68	66	65	58	65	66
Canada	1999	51	61	58	66	59	57	69	65	63	62
Czech Republic	1999	66	58	67	64	45	62	67	63	63	61
Denmark	1999	76	67	72	67	68	65	72	71	73	65
Finland	1999	74	78	69	77	68	73	63	65	70	70
France	1999	70	62	75	69	76	72	68	64	74	60
Germany	2000	51	49	62	59	64	65	59	62	60	53
Hungary	2001	83	81	84	94	59	48	58	69	77	78
Ireland	1998	50	36	70	55	46	43	83	60	66	43
Italy	1998	71	70	69	43	x(7)	x(8)	56	45	73	57
Korea	1998	57	62	69	70	87	96	92	99	67	50
Netherlands	1997	46	43	55	50	57	39	63	50	55	45
New Zealand	2001	59	57	61	70	x(7)	x(8)	68	54	62	62
Norway	1999	60	61	61	63	64	65	61	61	62	61
Portugal	1999	72	70	70	67	63	57	75	68	73	66
Spain	1998	61	x(1)	81	x(3)	70	x(5)	73	x(7)	79	x(9)
Sweden	1999	74	73	74	69	x(9)	x(10)	x(9)	x(10)	71	70
Switzerland	2001	50	50	55	52	61	42	63	66	54	47
United Kingdom	2001	55	43	50	53	53	81	66	66	54	54
United States	2001	58	65	60	54	62	57	57	50	60	51

Note: x indicates that data are included in another column. The column reference is shown in brackets after "x". *e.g.*, x(2) means that data are included in column 2.
Source: OECD. See Annex 3, Table 6 for national data sources (*www.oecd.org/els/education/eag2002*).

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Table A13.3.
Private internal rates of return to education (1999-2000)
The impact of length of studies, taxes, unemployment risk, tuition fees and public student support in upper secondary and tertiary education, by gender (in percentage points)

OECD COUNTRIES	Return on upper secondary education (in percentage points)[1]								Return on tertiary education (in percentage points)[2]											
	Comprehensive private internal rate of return		Impact of: Length of studies		Impact of: Taxes		Impact of: Unemployment risk		Comprehensive private internal rate of return		Impact of: Length of studies		Impact of: Taxes		Impact of: Unemployment risk		Impact of: Tuition fees		Impact of: Public student support	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Canada	13.6	12.7	11.9	10.8	-1.6	-1.2	3.6	3.1	8.1	9.4	8.4	10.6	-0.5	-1.3	0.6	0.6	-2.0	-2.7	1.6	2.2
Denmark	11.3	10.5	11.3	8.3	-2.2	-1.4	2.2	3.6	13.9	10.1	7.9	5.7	-0.4	-1.0	1.1	0.7	-0.1	-0.2	5.4	4.9
France	14.8	19.2	7.5	10.5	-1.0	-0.7	8.3	9.4	12.2	11.7	13.3	12.1	-1.6	-1.7	0.4	1.2	-0.8	-0.9	0.9	1.0
Germany	10.8	6.9	10.0	6.1	-2.1	-1.7	2.9	2.5	9.0	8.3	7.1	7.0	-1.5	-1.6	1.1	0.6	-0.3	-0.6	2.6	2.9
Italy[3]	11.2	m	9.5	m	m	m	1.7	m	6.5	m	6.7	m	m	m	0.5	m	-0.7	m	n	m
Japan	6.4	8.5	4.4	6.6	-0.2	-0.2	2.2	2.1	7.5	6.7	8.0	8.0	-0.3	-0.2	0.3	0.0	-1.6	-2.2	1.1	1.1
Netherlands[4]	7.9	8.4	6.9	7.9	-0.2	-1.6	1.2	2.1	12.0	12.3	11.7	9.4	-2.0	-1.0	n	0.7	-0.6	-0.7	2.9	3.9
Sweden[5]	6.4	m	3.9	m	-0.6	m	3.1	m	11.4	10.8	9.4	7.4	-1.5	-0.7	1.2	1.6	-0.7	-0.8	3.0	3.3
United Kingdom	15.1	m	12.4	m	-1.5	m	4.2	m	17.3	15.2	18.1	16.4	-2.1	-2.3	0.7	0.7	-2.4	-2.3	3.0	2.7
United States	16.4	11.8	14.4	10.6	-0.9	-1.3	2.9	2.5	14.9	14.7	18.9	18.8	-2.3	-2.0	0.9	1.4	-4.7	-6.0	2.1	2.7
Country mean[6]	*11.4*	*11.1*	*9.2*	*8.7*	*-1.1*	*-1.1*	*3.6*	*3.6*	*11.8*	*11.3*	*11.4*	*10.6*	*-1.3*	*-1.3*	*0.7*	*0.9*	*-1.5*	*-1.8*	*2.5*	*2.9*

1. The rate of return to upper secondary education is calculated by comparing the benefits and costs with those of lower secondary education.
2. The rate of return to tertiary education is calculated by comparing the benefits and costs with those of upper secondary education.
3. Data for males derive from 1998 post-tax earnings data.
4. Year of reference 1997.
5. In tertiary education, the theoretical length of standard tertiary courses is used in the calculations rather than the average theoretical length of different programmes for men and women. For women, earnings differential between upper and lower secondary levels are not large enough to permit a positive rate of return calculation.
6. Data for men exclude Italy; data for women in upper secondary education exclude Sweden and the United Kingdom.

Source: OECD.

Table A13.4.
Social rates of return to education (1999-2000)
Rates of return to upper secondary and tertiary education, by gender (in percentage points)

OECD COUNTRIES	Social return in upper secondary education[1]		Social return in tertiary education[2]	
	Males	Females	Males	Females
Canada[3]	m	m	6.8	7.9
Denmark	9.3	8.7	6.3	4.2
France	9.6	10.6	13.2	13.1
Germany	10.2	6.0	6.5	6.9
Italy[4]	8.4	m	7.0	m
Japan	5.0	6.4	6.7	5.7
Netherlands	6.2	7.8	10.0	6.3
Sweden	5.2	m	7.5	5.7
United Kingdom	12.9	m	15.2	13.6
United States	13.2	9.6	13.7	12.3

1. The rate of return to upper secondary education is calculated by comparing the benefits and costs with those of lower secondary education.
2. The rate of return to tertiary education is calculated by comparing the benefits and costs with those of upper secondary education.
3. In Canada, no data were available on expenditure per student in upper secondary education.
4. In Italy, the sample size of earnings for women was not large enough to allow for the calculation of rates of return.

Source: OECD.

THE RETURNS TO EDUCATION: LINKS BETWEEN HUMAN CAPITAL AND ECONOMIC GROWTH

- The accumulation of physical capital and human capital is important for economic growth, and differences between countries in this respect help significantly to explain the observed differences in growth patterns. In particular, the evidence suggests that investment in education may have beneficial external effects that make social returns to schooling greater than private returns, although improvements to education systems may take time to make significant impacts on average skills in the labour force, especially in ageing populations.

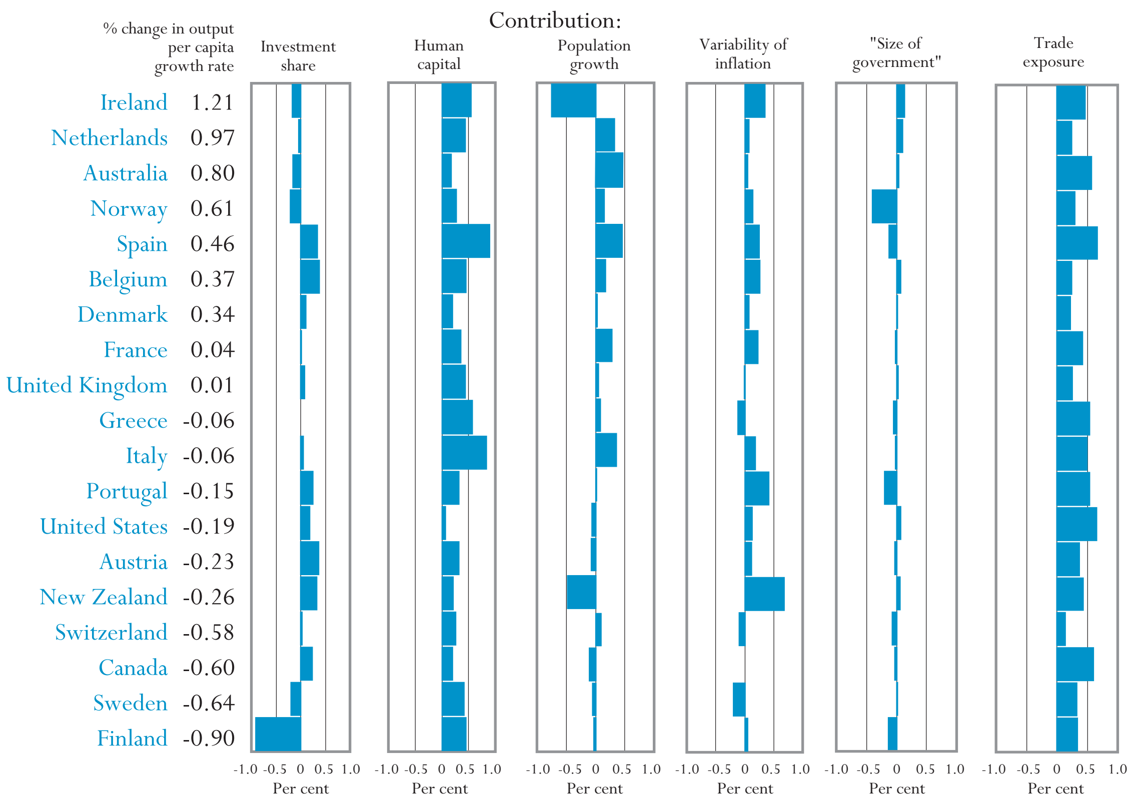
- Public expenditure on health, education and research clearly help to sustain living standards in the long term, and social transfers help to meet social goals, but these must all be financed. The necessary taxation could negatively affect incentives to save and invest.

- Macroeconomic policy geared towards low inflation and stable, sound public finances contributes to growth, for example by encouraging private accumulation of physical capital and a shift in investment towards projects with higher returns.

Chart A14.1.

Decomposition of changes in annual average growth rates of GDP per capita

Estimated effect of changes in explanatory variables to changes in output per capita growth rates over the period 1980s to 1990s



Countries are ranked in descending order of the percentage change in output per capita growth rate.
Source: OECD Economic Outlook, December 2000. Table A14.1.

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Policy context

This indicator estimates the effect of changes in explanatory variables, including human capital, on changes in output per capita growth rates over the period 1980 to 1990.

OECD countries have shown wide disparities in growth in recent decades. The 1990s, in particular, saw some relatively affluent countries (notably the United States) pulling further ahead, while growth in many other countries slowed. Persistent differences in the accumulation of different forms of capital (physical, human), market conditions and technological progress – all of which could be influenced by policy and institutions – are potentially important sources of these growth differences between countries. What is the relative importance of education and human capital in this equation? To address this question, this indicator estimates the effect of changes in explanatory variables, including human capital, on changes in output per capita growth rates over the period 1980 to 1990.

Evidence and explanations

Although there is agreement on the importance of policy and institutions for growth, the precise mechanisms linking policy to capital accumulation, economic efficiency, technical progress and, ultimately, output growth are still the subject of intense debate. In particular, policy and institutions may influence private decisions on savings and investment and the formation of human capital. They can also contribute to the overall efficiency with which resources are allocated in the economy over and above their effects on the accumulation of physical and human capital.

The precise mechanisms linking policy to capital accumulation, economic efficiency, technical progress and, ultimately, output growth are still the subject of an intense debate.

Studies on growth typically assume that formal skills and experience embodied in the labour force represent a form of (human) capital. It can be argued, however, that human capital, like physical capital, is subject to some kind of diminishing returns, so that a more highly trained and skilled workforce would enjoy higher levels of income in the long term, but not necessarily permanently higher rates of growth in income. Similarly, investment in human capital (*e.g.*, expenditure on education and training) could have a more permanent impact on growth if high skills and training were to go hand in hand with more intensive research and development and a faster rate of technological progress, or if the existence of a highly skilled labour force were to ease the adoption of new technologies.

In order to shed light on the impact of policy and institutions on output growth in OECD countries, an empirical analysis based on growth regressions was undertaken (for details see *Economic Outlook,* No. 68). Chart A14.1 shows the estimated effect of changes in explanatory variables on changes in output per capita growth rates from the 1980s to the 1990s.

The improvement in human capital has been a common factor behind growth in recent decades, and in some countries accounted for more than half a percentage point of growth in the 1990s.

The improvement in human capital seems to be a common factor behind growth in recent decades in all OECD countries, especially in Greece, Ireland, Italy and Spain, where the increase in human capital accounted for more than half an extra percentage point of growth in the 1990s compared with the previous decade. The impact might be seen to be larger if the measure of human capital used went beyond levels of formal educational attainment. However, although average levels of human capital have typically been rising – and continually feeding through into higher growth – the relatively slow rates of increase (half to one percentage point per decade) need to be borne in mind in evaluating this result.

The magnitude of the impact on growth found in this analysis suggests that the social returns to investment in education may be larger than those experienced by individuals

The magnitude of the impact on growth found in this analysis suggests that the social returns to investment in education may be larger than those experienced by individuals. This possibly reflects spill-over effects, such as links between levels of education and advances in technology, and more effective use of natural and physical resources, and implies that incentives for individuals to engage in education may be usefully enhanced by policy to reap maximum benefits for society as a whole. However, there are some caveats to this interpretation of the results. First, the impacts found in the analysis may be over-estimated because the indicator of human capital may be acting partially as a proxy for other variables, an issue also raised in some microeconomic studies. In addition, the empirical analysis suggests that the impact is determined with some imprecision. In any case, the average level of formal education is bound to react only slowly to changes in education policy, as the latter typically affect only young cohorts entering the labour force. Finally, extending the period of formal education may not be the most efficient way of providing workplace skills, and this aspect of education must also be balanced against other (sometimes competing) goals of education systems. Thus, for those countries at the forefront of educational provision, the growth dividend from further increases in formal education may be less marked than that implied in the empirical analysis.

The impact stemming from changes in the investment rate varies.

The contribution stemming from changes in the investment rate is more mixed. Some countries are estimated to have benefited from an increase in the business investment rate in the past decade (*e.g.*, Austria, Belgium, Canada, New Zealand, Portugal and Spain), while others experienced a negative impact from lower investment rates (*e.g.*, Finland, and to a lesser extent Norway and Sweden). There have also been important changes in policy and institutional settings in each country that have contributed to growth, over and above the changes in inputs of physical and human capital. Most countries have benefited, especially in the 1990s, from lower variability in inflation. The most noticeable examples include New Zealand and Portugal, where about half a percentage point of annual output per capita growth is estimated to be due to this factor, other things being equal.

The size of government has contributed to a marginal slowing of growth in many countries.

By contrast, despite greater fiscal discipline, especially in the last decade, the rise in the size of government has contributed to a marginal slowing of growth in many countries. Exceptions include Ireland and the Netherlands, where a reduction in taxes and expenditure as a proportion of GDP marginally boosted output per capita growth in the 1990s.

Finally, the general process of trade liberalisation in which all OECD countries have been involved is estimated to have increased growth by up to two-thirds

A14

The general process of trade liberalisation is estimated to have increased growth by up to two-thirds of a percentage point annually over the past decade.

of a percentage point annually over the past decade. Despite developments in the 1990s, there remain profound differences in the main determinants of economic growth across the OECD countries.

Definitions and methodologies

Human capital is estimated on the basis of completed levels of education and average years of schooling at each level in the working age population. It should be borne in mind that educational attainment is a crude and somewhat narrow proxy for skills and competencies, taking little account of the quality of formal education or of other important dimensions of human capital. It is derived from OECD data combined with data from de la Fuente and Doménech (2000). For a definition of the other factors (investment share, population growth, variability of inflation, trade exposure and size of government), see *Economic Outlook*, No. 68. Note that government consumption as a percentage of GDP is used as a proxy for the size of government for reasons of data availability. This variable is highly correlated in most countries with tax and non-tax receipts (as a proportion of GDP), although country coverage is more limited.

The calculations are from decompositions of differences in growth rates based on the results of multivariate regressions. Note that the sum of the contributions shown does not correspond to the observed change in output per capita growth rates because the estimated impact of initial levels of GDP per capita and the component unexplained by the regressions are not shown.

Chart A14.1 does not report the estimated effect on growth of different initial conditions (*i.e.*, the convergence process) nor does it show the unexplained country-specific effect. The coefficients used to perform the decomposition are from a growth equation that includes variability in inflation, trade exposure and government consumption (as a proportion of GDP) as a proxy for the potential effect of government "size" on growth.

The changes in growth are based on differences in average growth in GDP per person of working age over each decade. The 1980s cover the period 1981 to 1989; the 1990s cover the period up to 1997.

Table A14.1.

Decomposition of changes in annual average growth rates of GDP per capita (1980-1997)

Estimated effect of changes in explanatory variables to changes in output per capita growth rates over the period 1980s to 1990s[1] (in percentage points)

		% change in output per capita growth rate	Contribution from:					
			Investment share	Human capital	Population growth	Variability of inflation	"Size of government"[2]	Trade exposure
OECD COUNTRIES	Australia	0.80	-0.16	0.17	0.46	0.05	0.03	0.57
	Austria	-0.23	0.37	0.31	-0.07	0.12	-0.02	0.37
	Belgium	0.37	0.37	0.45	0.17	0.26	0.06	0.24
	Canada	-0.60	0.24	0.19	-0.10	0.01	-0.02	0.60
	Denmark	0.34	0.10	0.20	0.03	0.07	0.01	0.22
	Finland	-0.90	-0.91	0.44	-0.03	0.05	-0.13	0.33
	France	0.04	0.01	0.35	0.27	0.23	-0.02	0.42
	Greece	-0.06	n	0.57	0.09	-0.12	-0.05	0.54
	Ireland	1.21	-0.17	0.54	-0.75	0.35	0.13	0.46
	Italy	-0.06	0.05	0.84	0.36	0.18	-0.01	0.49
	Netherlands	0.97	-0.04	0.43	0.32	0.07	0.10	0.25
	New Zealand	-0.26	0.33	0.21	-0.47	0.68	0.06	0.44
	Norway	0.61	-0.21	0.27	0.15	0.14	-0.41	0.30
	Portugal	-0.15	0.25	0.32	0.02	0.42	-0.20	0.53
	Spain	0.46	0.33	0.90	0.46	0.25	-0.12	0.67
	Sweden	-0.64	-0.19	0.42	-0.05	-0.20	0.02	0.33
	Switzerland	-0.58	0.02	0.26	0.09	-0.09	-0.07	0.14
	United Kingdom	0.01	0.08	0.44	0.05	n	0.03	0.25
	United States	-0.19	0.19	0.07	-0.06	0.13	0.07	0.65

Note: The calculations are from decompositions of differences in growth rates based on the results of multivariate regressions. The sums of the contributions shown do not correspond to the change in output per capita growth rates because the estimated impact of initial levels of GDP per capita and the component unexplained by the regressions are not shown.

1. Changes in growth are based on differences in average growth in GDP per person of working age over each decade. The 1980s include the period 1981 to 1989; the 1990s cover the period up to 1997.

2. Government consumption as a percentage of GDP is used as a proxy for the size of government due to data inavailability. This variable is highly correlated in most countries with tax and non-tax receipts (as a share of GDP) for which, however, country coverage is more limited.

Source: OECD Economic Outlook, December 2000.

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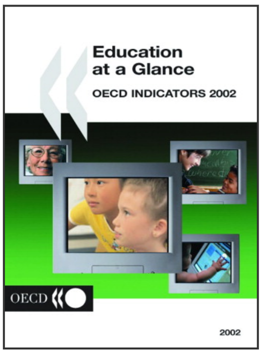

From:
Education at a Glance 2002
OECD Indicators

Access the complete publication at:
https://doi.org/10.1787/eag-2002-en

Please cite this chapter as:

OECD (2002), "The Output of Educational Institutions and the Impact of Learning", in *Education at a Glance 2002: OECD Indicators*, OECD Publishing, Paris.

DOI: https://doi.org/10.1787/eag-2002-3-en