

Comparative Indicators of Education in the United States and Other G-8 Countries: 2006

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SUMMARY

Introduction

This report describes how the education system in the United States compares with education systems in the other Group of Eight (G-8) countries. The G-8 countries—Canada, France, Germany, Italy, Japan, the Russian Federation, the United Kingdom, and the United States—are among the world's most economically developed countries. *Comparative Indicators of Education in the United States and Other G-8 Countries: 2006* draws on the most current information about education from three primary sources: the Indicators of National Education Systems (INES) project, conducted by the Organization for Economic Cooperation and Development (OECD); the 2003 Program for International Student Assessment (PISA 2003), also conducted by the OECD; and the 2003 Trends in International Mathematics and Science Study (TIMSS 2003), conducted by the International Association for the Evaluation of Educational Achievement (IEA). Begun in 2002, the series is published on a biennial basis.

It should be noted that most of the indicators in this report do not contain data for the complete set of G-8 countries. For example, Canada, France, and Germany did not participate in TIMSS 2003; therefore, these countries do not appear in indicators using these data. The United Kingdom is not included in indicators using PISA 2003 data due to low response rates; and in indicators using data from TIMSS 2003, the United Kingdom is represented separately by two of its component jurisdictions, England and Scotland.

The main findings of this report are summarized below. These highlights are organized around the five major sections of the report—population and school enrollment; academic performance; context for learning; expenditure for education; and education returns: educational attainment and income.

Population and School Enrollment

Youth Population

In 2006, the population of 5- to 29-year-olds (roughly the population most likely to be enrolled in education) represented 34 percent of the total population in the United States. In the other G-8 countries, the corresponding percentages ranged from 26 percent in Italy to 34 percent in the Russian Federation. In the past 10 years, the United States had the highest growth among the G-8 countries in the population of 5- to 29-year-olds, which increased by 7 percent between 1996 and 2006 (indicator 1).

Enrollment in Formal Education

In 2004, all or almost all 3- and 4-year-old children were enrolled in preprimary or primary education in France and Italy. In the other G-8 countries, at least three-quarters of 3- and 4-year-olds were enrolled in preprimary or primary education, with the exception of the United States, with 53 percent. Compulsory education, on average, ends at age 18 in Germany; age 17 in the United States; age 16 in Canada, France, and the United Kingdom; and age 15 in Italy, Japan, and the Russian Federation (indicator 2).

Foreign Students in Postsecondary Education

Among the G-8 countries, the United States had the most foreign students (in absolute numbers) enrolled in higher education,¹ but foreign students made up a higher percentage of enrollment in higher education in the United Kingdom (16 percent) as well as in Germany, France, and Canada (11 percent each). The United States was one of the countries with the smallest percentages of foreign students (3 percent); the others were Japan (3 percent), Italy (2 percent), and the Russian Federation (1 percent) (indicator 3).

Academic Performance

Fourth-Grade Mathematics and Science Performance

On the TIMSS 2003 fourth-grade assessment, higher percentages of students in Japan than in the other G-8 countries reached each established international benchmark in mathematics (indicator 4). In the United States and Scotland, fourth-grade males scored higher, on average, than fourth-grade females in both mathematics and science. In Italy, males outperformed females only in mathematics, whereas in England, Japan, and the Russian Federation, there were no significant differences by sex in mathematics or science (indicator 5).

Performance in Mathematics Literacy Among 15-Year-Old Students

On the PISA 2003 assessment, about one-quarter of 15-year-old students in the United States scored at or below the lowest proficiency level on the combined mathematics literacy scale, a higher proportion of students than in Germany, France, Japan, and Canada (indicator 6). Fifteen-year-old students in the United States generally scored lower, on average, than their peers in the same four G-8 countries on each of the four mathematics literacy subscales: space and shape, change and relationships, quantity, and uncertainty (indicator 7).

¹Internationally, education levels are defined according to the International Standard Classification of Education (ISCED). As used in this report, "higher education" refers to ISCED levels 5A (academic higher education below the doctoral level), 5B (vocational higher education), and 6 (academic higher education at the doctoral level) (except where specific data exclusions are noted). For more information on the ISCED levels, see appendix A.

Although U.S. students were generally at an advantage in terms of socioeconomic status (SES) compared to their G-8 peers, low-SES 15-year-old students in the United States were outperformed by their peers in Germany, France, Japan, and Canada in mathematics literacy (indicator 8).

In all G-8 countries, 15-year-old students who spoke the language of assessment, other official languages, or other national dialects at home most of the time scored higher in mathematics literacy than did their peers who spoke another language at home most of the time (indicator 9).

Relationship Between Reading and Mathematics Achievement

In all G-8 countries in PISA 2003, 15-year-old students who scored low in either mathematics or reading tended to score lower than average in the other subject as well. In the majority of the G-8 countries and for both reading and mathematics literacy, average scores in one subject area were at least 100 points lower (i.e., at least one standard deviation lower) than the average score for that country among those students who scored at level 1 or below in the other subject area (indicator 10).

Context for Learning

Mathematics Learning

In 2003, formal classroom instructional time per week on mathematics learning as reported by 15-year-olds ranged from an average of 3.0 hours in Germany to 3.7 hours in Canada and the United States. The number of instructional weeks per year ranged from 33.5 in Italy to 39.7 in Germany; in the United States, the number of instructional weeks per year was 36.0 (indicator 11).

Class Size and Ratio of Students to Teaching Staff

At the primary education level in 2004, two countries had an average class size of less than 20 students—the Russian Federation (16 students) and Italy (18 students). Four countries had an average class size between 20 and 25 students—Germany, with 22 students; France and the United States, both with 23 students; and the United Kingdom, with 24 students. Japan had the largest

average class size in primary education, with 29 students. The U.S. student/teacher ratio at the primary level (15) was lower than the ratio in all but one of the other G-8 countries. At the secondary level, student/teacher ratios ranged from 10 in the Russian Federation to 16 in the United States (indicator 12).

Teacher Professional Development in Mathematics and Science

In 2003, about two-thirds of U.S. fourth-graders had teachers who reported participating in professional development pertaining to mathematics content in the previous 2 years. Teacher participation in this area was lower in Italy, Japan, and Scotland (ranging from 29 to 42 percent), but higher in England (76 percent) (indicator 13).

In England, Italy, and the United States, there was generally more reported participation in professional development in mathematics than in science. Across all four professional development activities examined, no G-8 country had more fourth-graders with teachers reporting professional development participation in science than in mathematics (indicator 13).

School Principals' Uses for Assessments

In 2003, a greater percentage of U.S. 15-year-old students than their peers in all other G-8 countries had principals who reported using assessment results to compare their school's performance to district- or national-level performance. This frequency ranged from about 2 out of 10 students in Japan and Germany, 3 out of 10 students in Italy, and 7 out of 10 students in the Russian Federation and Canada to 9 out of 10 students in the United States. Similarly, a greater percentage of U.S. students than their peers in four other G-8 countries had principals who reported using assessment results to compare their school with other schools (80 percent in the United States vs. 53 percent in Canada, 29 percent in Italy, 17 percent in Germany, and 12 percent in Japan). Assessment results were also more likely to be used in the United States than in the same four G-8 countries to monitor schools' progress from year to year (93 percent in the United States compared to a range from 44 to 79 percent). In the United States, the assessment purpose least frequently cited was making judgments about teachers' effectiveness (55 percent) (indicator 14).

Expenditure for Education

Public School Teachers' Salaries

In 2004, the United States paid the second highest average starting salary to public school teachers at both the primary and upper secondary education levels with minimum training (roughly \$32,000). For public school teachers with minimum training plus 15 years of experience, average salaries were higher in England, Scotland, Japan, and Germany than in the United States at both education levels. In most G-8 countries, public school teachers at both education levels with minimum training earned less than the average gross domestic product (GDP) per capita in their respective countries. On the other hand, in all G-8 countries, public school teachers at both education levels with minimum training plus 15 years of experience earned at least as much as the average GDP per capita in their respective countries (indicator 15).

Expenditure for Education

All of the G-8 countries in 2003 spent more money per student at the higher education level than at the combined primary and secondary education levels; however, more money in total was spent at the combined primary and secondary education levels than at the higher education level, where student enrollment is much lower. The United States spent \$24,074 per student at the higher education level and \$8,943 per student at the combined primary and secondary education levels, with both amounts higher than the corresponding figures in all other G-8 countries. In total dollars as a percentage of GDP, the United States spent 2.9 percent of its GDP on higher education and 4.1 percent of its GDP on primary and secondary education. Considering education expenditure at all levels combined, the United States spent a higher percentage of its GDP on education (7 percent) than did any of the other G-8 countries (indicator 16).

Education Returns: Educational Attainment and Income

In 2004, the Russian Federation had the largest percentage of adults ages 25 to 64 who had completed higher education (55 percent), followed by Canada (45 percent); Italy had the smallest percentage (11 percent).² In the United States, 39 percent of adults ages 25 to 64 had completed higher education. Among 25- to 34-year-olds, 36 percent of U.S. males and 42 percent of U.S. females had completed higher education (indicator 17). In all of the G-8 countries except Germany, a greater percentage of first university degrees³ were awarded in the combined field of social sciences, business, and law than in any other field, with the highest percentage awarded in the United States. In contrast, in science, mathematics, and engineering-related fields, the United States awarded the lowest percentage of first university degrees of all the G-8 countries (indicator 18).

In the United States and all other G-8 countries, higher employment rates were associated with higher levels of educational attainment. For example, among U.S. adults ages 25 to 64 in 2004, 83 percent of those who had completed academic higher education were employed, compared with 73 percent of those whose highest educational attainment was upper secondary education or postsecondary vocational training and 57 percent of those whose highest educational attainment was lower secondary education or below (indicator 19). Eighty-three percent of U.S. adults ages 25 to 64 whose highest educational attainment was at the lower secondary level or below earned at or below the median income of U.S. adults in 2004, while 69 percent who attained at least a first university degree earned above the median income (indicator 20).

²In the Russian Federation, the reference year is 2003 rather than 2004.

³Programs that prepare students for advanced research and highly qualified professions are classified as first university degree programs. First university degree programs vary in duration in different countries in different programs of study. In the United States, the first university degree corresponds to a bachelor's degree; it excludes associate's degrees.

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Introduction

INTRODUCTION

With the emergence and growth of the global economy, many have turned to international comparisons to assess how well national systems of education are performing. These comparisons shed light on a host of issues, from access to education to equity of the resources devoted to educational achievement. They provide the opportunity to compare different aspects of countries' education systems, assess these systems' performance, and identify potential strategies to improve student achievement and system outputs.

Since the 1960s, the United States has participated actively in international projects that are designed to provide key information about the performance of the U.S. education system relative to education systems in other countries. These projects include the Indicators of National Education Systems (INES) at the Organization for Economic Cooperation and Development (OECD); the Trends in International Mathematics and Science Study (TIMSS) and the Progress in International Reading Literacy Study (PIRLS), both conducted by the International Association for the Evaluation of Educational Achievement (IEA); and OECD's Program for International Student Assessment (PISA). This report, *Comparative Indicators of Education in the United States and Other G-8 Countries: 2006*, draws on the most current information available from most of these projects at the time the report was being produced (in the summer and fall of 2006) to present a set of education indicators that describes how the U.S. education system compares with those in other economically developed countries.¹ Updated information from these various projects will be incorporated in subsequent reports.

Although the international education projects cited above involve many countries worldwide, the comparisons in this report focus on the Group of Eight (G-8) countries: Canada, France, Germany, Italy, Japan, the Russian Federation, the United Kingdom, and the United States. These are among the most industrialized countries in the world. The G-8 countries were selected as a comparison group because of the similarities in their economic development and because the other G-8 countries are among the major economic competitors of the United States. The leaders of these countries meet regularly to discuss economic and other policy issues.

What's New in 2006?

Whereas the previous *Comparative Indicators* reports (in 2004 and 2002) were organized largely around levels of education, the current report is organized by topic around the following sections—population and school enrollment; academic performance; context for learning; expenditure for education; and education returns: educational attainment and income. The indicators in this report were prepared using new results from three main sources: PISA 2003, TIMSS 2003, and new data compiled by OECD and reported in the 2006 edition of *Education at a Glance*. Findings from PISA 2003, an

assessment of 15-year-old students, were used to create new indicators on topics such as mathematics achievement and language spoken at home, mathematics achievement and socioeconomic status, time spent on mathematics learning, student perception of teacher support in mathematics lessons, the relationship between reading and mathematics achievement, and school principals' reports of the purposes of assessment. Findings from TIMSS 2003 were used to create new indicators pertaining to fourth-graders in mathematics and science—their overall academic performance based on established international benchmarks, differences by sex in their academic achievement, and reports by their teachers about their professional development in these subject areas. The 2006 edition of *Education at a Glance* was used not only to update many existing indicators, but also to develop several new indicators. These new indicators cover class size and the ratio of students to teaching staff, expenditure in education institutions by service category, educational attainment in the adult population, and the distribution of the population by education and income.

Education Levels Used for the Indicators

Many of the indicators in this report refer to at least one of the following education levels: preprimary education, primary education, secondary education, and higher education. A brief overview of the education levels is presented here to provide the reader with a frame of reference while reading the indicators (see appendix A for a more detailed description). To ensure comparability in the indicators across countries, each country restructured its national education data to correspond with the definitions of education levels that were developed in the 1997 revision of the International Standard Classification of Education (ISCED) (United Nations Educational, Scientific and Cultural Organization 1997). The following descriptions highlight the key features of (1) education programs from preprimary through secondary education and (2) higher education programs.

Preprimary education includes programs of education for children at least 3 years of age that involve organized, center-based instructional activities; in most countries, preprimary education is not compulsory. Primary education includes programs that are designed to give students a sound basic education in reading, writing, and mathematics, along with an elementary understanding of other subjects, such as history, geography, science, art, and music. In the international classification, primary education usually begins at the start of compulsory education (around age 6) and lasts for 6 years. Secondary education encompasses two stages: lower secondary education and upper secondary education. Lower secondary education includes programs that are designed to complete basic education; the standard duration in the international classification is 3 years. Upper secondary education is designed to

¹Data from the 2001 administration of PIRLS were used extensively in the 2004 edition of this report (see <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2005021>). PIRLS was again administered in 2006, and these data will be used in the 2008 edition of this report.

provide students with more in-depth knowledge of academic or vocational subjects and to prepare them for higher level academic or vocational studies or entry into the labor market. The standard duration of upper secondary education in the international classification is 3 years.

Higher education includes tertiary programs² that fall into three main categories:

- *Academic higher education below the doctoral level.* These programs are intended to provide sufficient qualifications to gain entry into advanced research programs and professions with high skill requirements. The international classification includes programs of medium length that last less than 5 years and long programs that last 5 to 7 years. In the United States, bachelor's, master's, and first professional degree programs are classified at this level.
- *Vocational higher education.* These programs provide a higher level of career and technical education and are designed to prepare students for the labor market. In the international classification, these programs last 2 to 4 years.
- *Doctoral level of academic higher education.* These programs usually require the completion of a research thesis or dissertation.

The international classification also includes an education level that straddles the boundary between secondary and higher education: postsecondary nontertiary education. This program of study—which is primarily vocational in nature—is generally taken after the completion of secondary school, but the subject content is not more advanced than the content of secondary school courses. In the United States, these programs are often in the form of occupationally specific vocational certificate programs, such as 1-year certification programs offered at community colleges.³

Mapping G-8 Countries' Education Systems to the ISCED

Differences in the structure of countries' education systems often make international comparisons difficult. To improve the comparability of education indicators, OECD and UNESCO worked with countries to standardize their education systems with the ISCED, as described above. Using ISCED classifications as a starting point, the National Center for Education Statistics (NCES) worked with education professionals in other G-8 countries to create a general overview of each country's education system. As an aid to the reader, schematics of how the ISCED applies to each of the G-8 countries are provided in appendix A, accompanied by text describing each system in greater detail.

Organization of the Report

The report begins with a summary section that highlights key findings; it then presents 20 indicators that compare different aspects of the education system in the United States to education systems in other G-8 countries. The indicators are organized into the following sections:

- population and school enrollment;
- academic performance;
- context for learning;
- expenditure for education; and
- education returns: educational attainment and income.

The first section, *population and school enrollment*, presents indicators that suggest the potential demand for education in countries as measured by the size and growth of their youth population and current levels of enrollment in formal education. The section concludes with an indicator that examines the extent to which foreign students are enrolled in higher education across the G-8 countries.

The next section, *academic performance*, presents indicators on student achievement in mathematics and science in the G-8 countries, including achievement differences across key demographic variables such as sex, socioeconomic status (SES), and language spoken at home. This section also presents an analysis of the relationship between mathematics and reading achievement.

The third section highlights a range of key policy-relevant issues pertaining to the *context for learning*, including instructional time, class size and the ratio of students to teaching staff, and teacher professional development in mathematics and science. This section also presents a cross-national look at the purposes of assessment as reported by school principals.

The fourth section provides a comparative look at *expenditure for education*, including breakdowns by expenditure as a percentage of a country's gross domestic product (GDP) and an indicator on public school teacher salaries in primary and secondary education.

The final section, *education returns: educational attainment and income*, focuses on educational attainment, employment rates, and earnings (including breakdowns by sex and field of study).

Each indicator is presented in a two-page format. The first page presents key findings that highlight how the United States compares with its G-8 peers (with data available) on the indicator. The key findings are followed by a short section that defines the indicator and describes key features of the methodology used to produce it. The second page presents graphical depictions of the data that support the key findings. These tables and/or figures also include the specific data source for the indicator and more detailed notes on interpreting the data.

²In the international classification, more advanced postsecondary education (such as attending a 4-year college or university) is referred to as tertiary education. In the current report, the term "higher education" is used because this term is more familiar to American readers.

³In data showing the ratio of students to teaching staff (indicator 12) and annual education expenditure (indicator 16), postsecondary nontertiary education data are included under secondary education and/or higher education for one or more countries as specified in the figures. In data showing the percentage distribution of the population by highest level of education completed (indicator 17), employment rates (indicator 19), and the distribution of the population by education and income (indicator 20), all of the G-8 countries reporting data show a combined category that includes upper secondary education and postsecondary nontertiary programs.

Data Sources

There are three main sources of data for this report:

- *INES data.* Data from the INES project come from tables in *Education at a Glance: OECD Indicators 2006* or from OECD's online Education Database. These data are derived from annual data collections carried out by OECD, with member countries' data coming from a variety of national data sources, including administrative data collections, school surveys, household surveys, and national financial reports. Most of the indicator data for the United States come from the Current Population Survey (CPS) of the U.S. Census Bureau, the NCES Common Core of Data (CCD), the NCES Integrated Postsecondary Education Data System (IPEDS), and the NCES Schools and Staffing Survey (SASS).
- *PISA 2003 data.* PISA is conducted by the OECD and is an assessment of 15-year-old students, with a major focus in 2003 on mathematics literacy.
- *TIMSS 2003 data.* TIMSS is conducted by the IEA. Due to the availability of fourth-grade data from a larger number of G-8 countries in TIMSS 2003, this report uses data from the fourth-grade assessments in mathematics and science, rather than eighth-grade data.

Data for indicator 1, on youth population, are from the International Data Base (IDB) of the U.S. Census Bureau.

When interpreting the data presented in this report, it is important for readers to be aware of limitations based on the source of information and problems that may exist in verifying comparability in reporting. Throughout this report, the unit of analysis is often the student. For example, many of the indicators show the mean scores of students (e.g., indicators 5 and 7) or the percentage of students along a particular characteristic (e.g., indicators 4 and 9). Other indicators also use the student as the unit of analysis, but report data from other sources. For example, using data from PISA 2003, indicator 14 shows the percentage of students whose principals reported that they used assessment results for various purposes. Using data from TIMSS 2003, indicator 13 shows the percentage of students whose teachers reported participating in various professional development activities. In several other indicators, the unit of analysis is not the student. For example, in indicator 15, the unit of analysis is the teacher (i.e., teacher salaries), and in indicator 18, the unit of analysis is postsecondary degrees. Except for indicator 15, which explicitly states that the data pertain to public school teachers only, the indicators in this report include data from both public and private schools.

Availability of Country Data

It should be noted that most of the indicators in this report do not contain data for the complete set of G-8 countries. That is, specific countries are sometimes not included or are only partially included in an indicator. This is often the result of source data not being available or specific countries not participating in a particular survey. For example, Canada, France, and Germany did not participate in TIMSS 2003; therefore, these countries do not

appear in indicators using these data. The United Kingdom deserves special mention. In indicators from *Education at a Glance: OECD Indicators 2006*, the United Kingdom includes England, Northern Ireland, Scotland, and Wales. In indicators using data from TIMSS 2003, the United Kingdom is represented separately by two of its component jurisdictions, England and Scotland. While every effort was made to use the most up-to-date data available across the G-8 countries (usually from 2003 or 2004), data from an earlier year, such as 2002, were sometimes used if more recent data were not available. To make this clear to the reader, these occurrences are noted in relevant tables and figures.

Sampling and Response Rates

In sample surveys like PISA and TIMSS, participating countries were expected to make great efforts to secure the participation of sampled schools and students. However, 100 percent participation at the school and student levels, and across items, is often not attainable.

In anticipation of the fact that school participation falls short of 100 percent in many countries and, thus, to avoid sample size losses resulting from this, a mechanism was instituted to identify, a priori, replacement schools for each sampled school. For each sampled school, the next school on the ordered school sampling frame was identified as its replacement, and the one after that as a second replacement, should it be needed. The use of implicit stratification variables and the subsequent ordering of the school sampling frame by size ensured that any sampled school's replacement would have similar characteristics. Although this approach does not guarantee avoiding response bias, it may reduce the potential for bias, and was deemed more acceptable than over-sampling to accommodate a low response rate. Consistent with what has been done in TIMSS 2003 reports published by IEA, TIMSS 2003 participating countries that met sample participation rates only after including replacement schools have been footnoted in the tables and figures of this report.

In order that PISA and TIMSS can ensure reliable and internationally comparable data, participating countries agree ahead of time on a process for the validation of all national data submissions. As the basis for this process, PISA and TIMSS have established technical standards for the quality of datasets which countries must meet in order to be included in the comparative results. These standards are described in detail in the technical reports (Martin, Mullis, and Chrostowski 2004; OECD 2005). In the case of the United Kingdom in PISA 2003, OECD (2004) reported that the uncertainties surrounding the sample and its bias are such that its scores cannot reliably be compared with those of other countries. Thus, in the indicators in this report using data from from PISA 2003, it is noted that the United Kingdom is not included due to low response rates.

Consistent with NCES statistical standards, item response rates less than 85 percent are footnoted in the tables and figures of this report, as well as instances where reporting standards are not met because of too few observations to provide reliable estimates.

Statistical Testing

About half of the indicators presented in this report are derived either from administrative records that are based on universe collections or from national sample surveys for which standard errors were not available. Consequently, for these indicators, no tests of statistical significance were conducted to establish whether observed differences from the U.S. average were statistically significant. However, for the 10 indicators derived from PISA or TIMSS data (indicators 4 through 11, 13, and 14), student's *t* statistics were calculated for comparisons of estimates within or between countries (e.g., to test whether a U.S. estimate is statistically different from other G-8 countries' estimates). Differences were reported if they were found to be statistically significant at the .05 level, using two-tailed tests of significance.

Other International Indicator Publications

Prior to this report, NCES produced two earlier reports, in 2004 and 2002, describing how education in the United States compares with education in the other G-8 countries. The 2004 report can be found at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2005021>. The 2002 report can be found at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2003026>. General information about the International Activities Program at NCES, including work on international comparisons in education, can be found at <http://nces.ed.gov/surveys/international>.

A group of four diverse students (two boys and two girls) are smiling and looking towards the camera in a school hallway. They are holding books and papers. The background shows rows of school lockers. The entire image has a light green tint.

INDICATORS PART I

Population and School Enrollment

YOUTH POPULATION

Key Findings: Canada, France, Germany, Italy, Japan, Russian Federation, United Kingdom, United States

The United States had the highest growth among the G-8 countries in the population of 5- to 29-year-olds, which increased by 7 percent between 1996 and 2006.

In 2006, the total population across the G-8 countries ranged from 33.1 million in Canada to 298.4 million in the United States, and the population of 5- to 29-year-olds (roughly the population most likely to be enrolled in education) ranged from 10.6 million in Canada to 102.9 million in the United States (table 1). The population of 5- to 29-year-olds represented 34 percent of the total population in the United States (table 2). In the other G-8 countries, the corresponding percentages ranged from 26 percent in Italy to 34 percent in the Russian Federation.

Focusing on the subpopulation of 5- to 19-year-olds (which generally includes individuals of primary- and secondary-school age) reveals that this age group represented 21 percent of the total population in the United States in 2006. The U.S. percentage was higher than the percentages in all of the other G-8 countries, which ranged from 14 percent in Italy to 19 percent in Canada and the United Kingdom.

Considering the high end of the age range, the subpopulation of 20- to 29-year-olds (which generally includes individuals of postsecondary education age) represented 14 percent of the total population in the United States in 2006, falling below the percent-

age in the Russian Federation (16 percent). The percentages in the other G-8 countries were slightly lower than in the United States, ranging from 11 percent in Germany and Italy to 13 percent in Canada, France, and the United Kingdom.

Between 1996 and 2006, the United States had the highest growth in the population of 5- to 29-year-olds (7 percent) (figure 1). Among the other G-8 countries, only Canada experienced growth over this period (3 percent). The population of 5- to 29-year-olds declined in all of the other G-8 countries, with decreases ranging from 2 percent in the United Kingdom to 18 percent in Italy.

Consistent with the results for the broader youth population, the United States had the highest growth in the subpopulation of 5- to 19-year-olds, which increased by 6 percent between 1996 and 2006. There were also increases in Canada and the United Kingdom (3 percent and 2 percent, respectively). All of the other G-8 countries experienced a decline over this period, with the largest in the Russian Federation (27 percent).

With respect to the high end of the age range, the United States had the second highest growth in the subpopulation of 20- to 29-year-olds, which increased by 9 percent between 1996 and 2006. With the exception of increases in the Russian Federation and Canada (14 percent and 4 percent, respectively), the other G-8 countries experienced a decline over this period, ranging from 7 percent in the United Kingdom to 27 percent in Italy.

Definitions and Methodology

In each country, the percentage of the population of 5- to 29-year-olds in 1996 and 2006 is calculated by dividing the population of 5- to 29-year-olds by the total population. The percentage change in the population of 5- to 29-year-olds is calculated by subtracting the population of 5- to 29-year-olds in 1996 from this population in 2006 and dividing by the 1996 population of 5- to 29-year-olds.

These calculations are applied in the same way to the age groups 5 to 19 and 20 to 29. The age group (e.g., 5 to 29) as a percentage of the total population may have declined from 1996 to 2006 even though the size of the age group may have increased. This is due to a higher rate of increase of the total population compared to the rate of increase for the specific population age group.

Table 1. Population aged 5 to 29, 5 to 19, and 20 to 29, by country: 1996 and 2006
(in millions)

Age group and year	Canada	France	Germany	Italy	Japan	Russian Federation	United Kingdom ¹	United States
Total population (all ages)								
1996	30.0	58.4	81.9	57.4	125.6	148.3	58.6	269.7
2006	33.1	60.9	82.4	58.1	127.5	142.1	60.6	298.4
Population aged 5 to 29								
1996	10.3	20.0	24.8	18.2	41.2	54.4	19.4	96.1
2006	10.6	18.9	22.4	14.8	34.1	47.8	19.1	102.9
Population aged 5 to 19								
1996	6.0	11.5	13.6	9.1	22.1	34.4	11.1	58.2
2006	6.2	11.2	12.9	8.2	18.5	25.0	11.3	61.6
Population aged 20 to 29								
1996	4.2	8.5	11.2	9.1	19.2	20.0	8.3	37.9
2006	4.4	7.7	9.5	6.6	15.6	22.9	7.8	41.3

¹The United Kingdom includes England, Northern Ireland, Scotland, and Wales.

SOURCE: U.S. Department of Commerce, U.S. Census Bureau. (2006). International Data Base (IDB), Table 94: Midyear Population, by Age and Sex, 1996 and 2006.

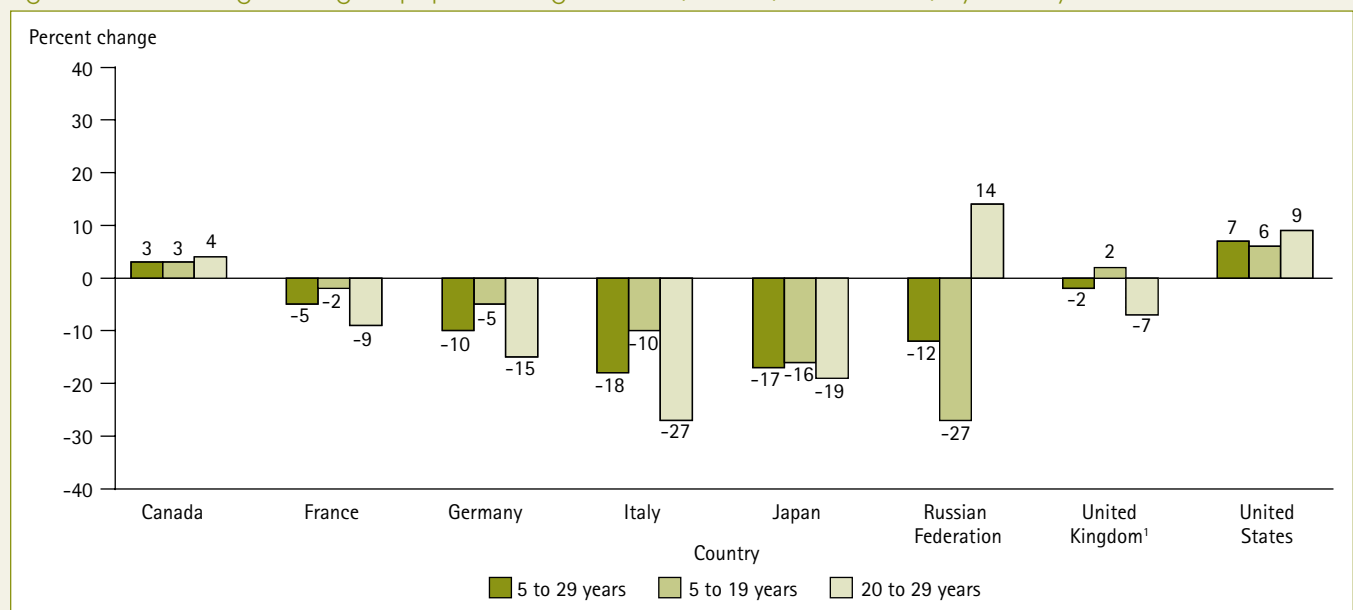
Table 2. Percentage of population aged 5 to 29, 5 to 19, and 20 to 29, by country: 1996 and 2006

Age group and year	Canada	France	Germany	Italy	Japan	Russian Federation	United Kingdom ¹	United States
Population aged 5 to 29								
1996	34.3	34.2	30.3	31.7	32.8	36.7	33.2	35.7
2006	32.1	31.1	27.2	25.5	26.7	33.7	31.4	34.5
Population aged 5 to 19								
1996	20.1	19.7	16.6	15.9	17.6	23.2	18.9	21.6
2006	18.8	18.4	15.7	14.1	14.5	17.6	18.6	20.7
Population aged 20 to 29								
1996	14.1	14.5	13.7	15.8	15.2	13.5	14.2	14.1
2006	13.3	12.7	11.5	11.4	12.2	16.1	12.8	13.8

¹The United Kingdom includes England, Northern Ireland, Scotland, and Wales.

SOURCE: U.S. Department of Commerce, U.S. Census Bureau. (2006). International Data Base (IDB), Table 94: Midyear Population, by Age and Sex, 1996 and 2006.

Figure 1. Percentage change in population aged 5 to 29, 5 to 19, and 20 to 29, by country: 1996 to 2006



¹The United Kingdom includes England, Northern Ireland, Scotland, and Wales.

SOURCE: U.S. Department of Commerce, U.S. Census Bureau. (2006). International Data Base (IDB), Table 94: Midyear Population, by Age and Sex, 1996 and 2006.

ENROLLMENT IN FORMAL EDUCATION

Key Findings: Canada, France, Germany, Italy, Japan, Russian Federation, United Kingdom, United States

All or almost all 3- and 4-year-old children were enrolled in preprimary or primary education in France and Italy. In the other G-8 countries, at least three-quarters of 3- and 4-year-olds were enrolled, with the exception of the United States, with 53 percent.

In 2004, all or almost all 3- and 4-year-old children were enrolled in preprimary or primary education programs in France and Italy (table 3). In the other G-8 countries reporting data, at least three-quarters of 3- and 4-year-olds were enrolled in preprimary or primary education programs, with the exception of the United States, with 53 percent. Beginning at age 6 in Germany and the United States, and at age 7 in the Russian Federation, at least 90 percent of the population was enrolled in formal education (figure 2).

In 2004, the United States and the other G-8 countries had close to universal school participation of children ages 5–14—the age range that typically corresponds with primary and lower secondary education (table 3). In the Russian Federation, 90 percent of 5- to 14-year-olds were enrolled in formal education programs, with all other G-8 countries at 97 percent participation or higher.

The United States had an enrollment rate of 76 percent in 2004 for youth ages 15–19—the age range that corresponds most closely with upper secondary education. The enrollment rates for this age group were 79 percent in Italy and the United Kingdom. In France and Germany, the enrollment rates were 87 and 89 percent, respectively.

Compulsory education, on average, ends at age 18 in Germany; age 17 in the United States; age 16 in Canada, France, and the United Kingdom; and age 15 in Italy, Japan, and the Russian Federation (figure 2). Participation in formal education tends to be high until the end or close to the end of compulsory education. In France and Japan, over 90 percent of the population was enrolled in formal education beyond the ending age of compulsory education.

Enrollment rates for 20- to 29-year olds—the age range that corresponds most closely to the typical age of enrollment in higher education—were less than 30 percent among the five G-8 countries reporting data (table 3). The United States had an enrollment rate of 23 percent for this age range. The U.S. rate was lower than the rates in Germany and the United Kingdom (both at 28 percent), but higher than the rates in France (21 percent) and Italy (19 percent).

Definitions and Methodology

The percentage of the population at given ages enrolled in education is called an “enrollment rate.” In this indicator, the term “enrollment rate” refers to the “net enrollment rate” and is defined as the number of students in a particular age group enrolled in education divided by the population of that same age group.

The reference year is 2004 for population and enrollment data in all countries; however, reference dates within the year may differ. Thus, enrollment rates may exceed 100 percent for some countries and some age categories largely due to different reference dates for school enrollment and population data.

Enrollments include all full-time and part-time students in public and private institutions. Enrollment in preprimary education programs (generally the 3- to 4-year-old age group) includes only children in center-based programs and excludes children in home-based early childhood education.

The ending age of compulsory education is the age at which individuals are no longer required to participate in formal education.

Table 3. Percentage of population aged 3 to 29 enrolled in formal education, by age group and country: 2004

Country	Students participating in formal education			
	3- to 4-year-olds ¹	5- to 14-year-olds	15- to 19-year-olds	20- to 29-year-olds
France ²	116.3	101.6	87.1	20.8
Germany	76.9	97.9	88.8	27.9
Italy ²	104.9	101.6	78.8	19.4
Japan	81.4	100.7	—	—
Russian Federation	—	90.4	—	—
United Kingdom ³	76.7	100.4	79.0	27.8
United States	52.9	97.3	76.5	23.4

—Not available.

¹Data show students age 4 and under as a percentage of the population of 3- to 4-year-olds.

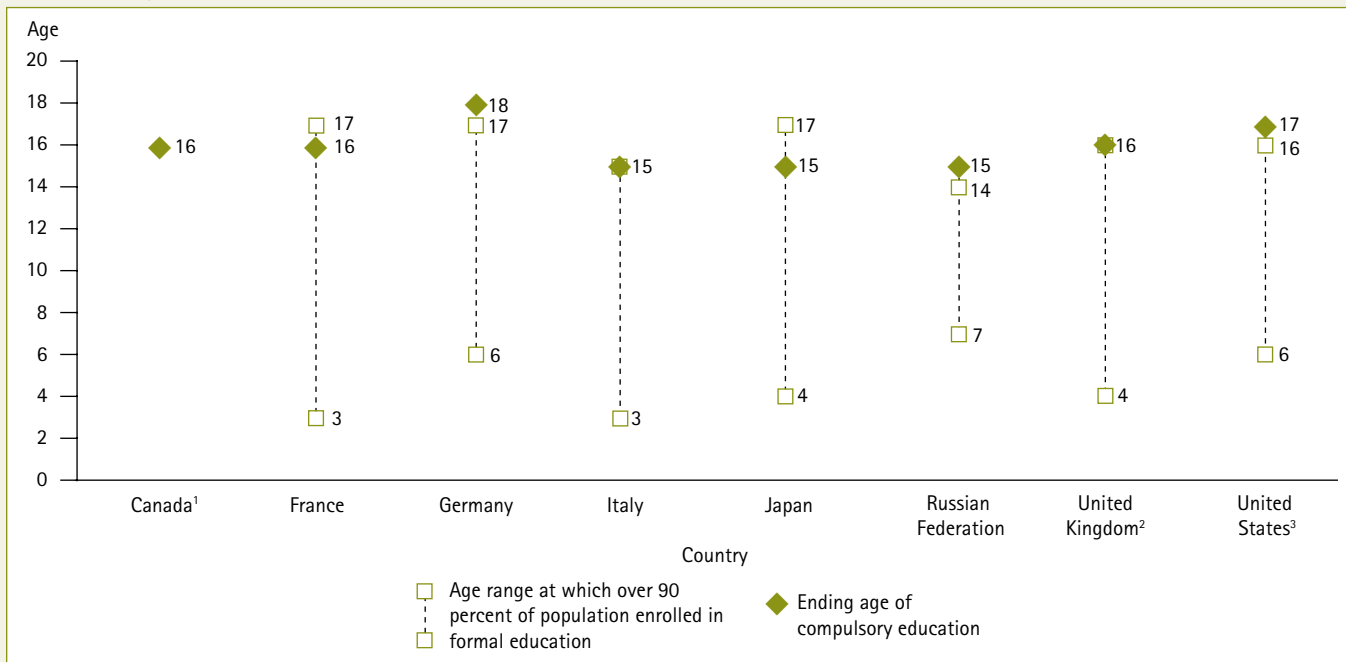
²The percentage of 3- to 4-year-olds enrolled in formal education is overestimated, as there are a significant number of enrolled students under the age of 3. The percentage of 3- to 4-year-olds enrolled in formal education is around 100 percent.

³The United Kingdom includes England, Northern Ireland, Scotland, and Wales.

NOTE: Reference year is 2004 for population and enrollment data in all countries; however, reference dates may differ within that year. Enrollment rates for some countries exceed 100 percent in one or more age ranges due to different reference dates for school enrollment and population data. Enrollment in formal education at the preprimary education level includes children in center-based programs and excludes children in home-based early childhood education.

SOURCE: Organization for Economic Cooperation and Development (OECD). (2006). *Education at a Glance: OECD Indicators 2006*, table C1.2. Paris: Author.

Figure 2. Range of ages at which over 90 percent of the population is enrolled in formal education, and ending age of compulsory education, by country: 2004



¹For the age range at which over 90 percent of the population is enrolled in formal education, data for Canada are not available.

²The United Kingdom includes England, Northern Ireland, Scotland, and Wales.

³The average ending age of compulsory education in the United States is 17. This age varies across states, ranging from 16 to 18; the modal age is 16 (*Digest of Education Statistics, 2005*, table 147, U.S. Department of Education, National Center for Education Statistics, 2006).

NOTE: Reference year is 2004 for population and enrollment data in all countries; however, reference dates may differ within that year. Enrollment in formal education at the preprimary education level includes children who attended center-based programs and excludes children in home-based early childhood education. The ending age of compulsory education is the age at which individuals are no longer required to participate in formal education. For example, an ending age of 18 indicates that all students under 18 are legally obliged to participate in formal education.

SOURCE: Organization for Economic Cooperation and Development (OECD). (2006). *Education at a Glance: OECD Indicators, 2006*, table C1.2. Paris: Author.

FOREIGN STUDENTS IN HIGHER EDUCATION

Key Findings: Canada, France, Germany, Italy, Japan, Russian Federation, United Kingdom, United States

Among the G-8 countries, the United States had the most foreign students (in absolute numbers) enrolled in higher education, but foreign students made up a higher percentage of enrollment in higher education in Canada, France, Germany, and the United Kingdom.

Over the past 3 decades, the number of foreign students (i.e., students enrolled outside their country of citizenship) in higher education has grown more than fourfold: from 0.6 million worldwide in 1975 to 2.7 million in 2004 (OECD 2006a). In 2004, G-8 countries hosted about two-thirds of the foreign students in higher education, with a majority of them enrolled in four countries: the United States, which received the largest percentage of these foreign students (22 percent); the United Kingdom (11 percent); Germany (10 percent); and France (9 percent) (figure 3a). Altogether, in 2004, these four G-8 countries accounted for 52 percent of all foreign students enrolled in higher education.

In addition to examining how many foreign students are hosted by each G-8 country (as a percentage of all foreign students enrolled

in higher education), the extent of student mobility in the G-8 countries can be examined by two measures that take into account the size of a country's higher education system: (1) the percentage of a country's students enrolled in higher education who are foreign students (i.e., foreign students by country of destination) and (2) the percentage of a country's students enrolled in higher education who study abroad (i.e., foreign students by country of origin).

Among the G-8 countries, the United States had the most foreign students (in absolute numbers) enrolled in higher education, but foreign students made up a higher percentage of enrollment in higher education in the United Kingdom (16 percent) as well as in Germany, France, and Canada (11 percent each) (figure 3b). The United States was one of the countries with the smallest percentages of foreign students (3 percent); the others were Japan (3 percent), Italy (2 percent), and the Russian Federation (1 percent).

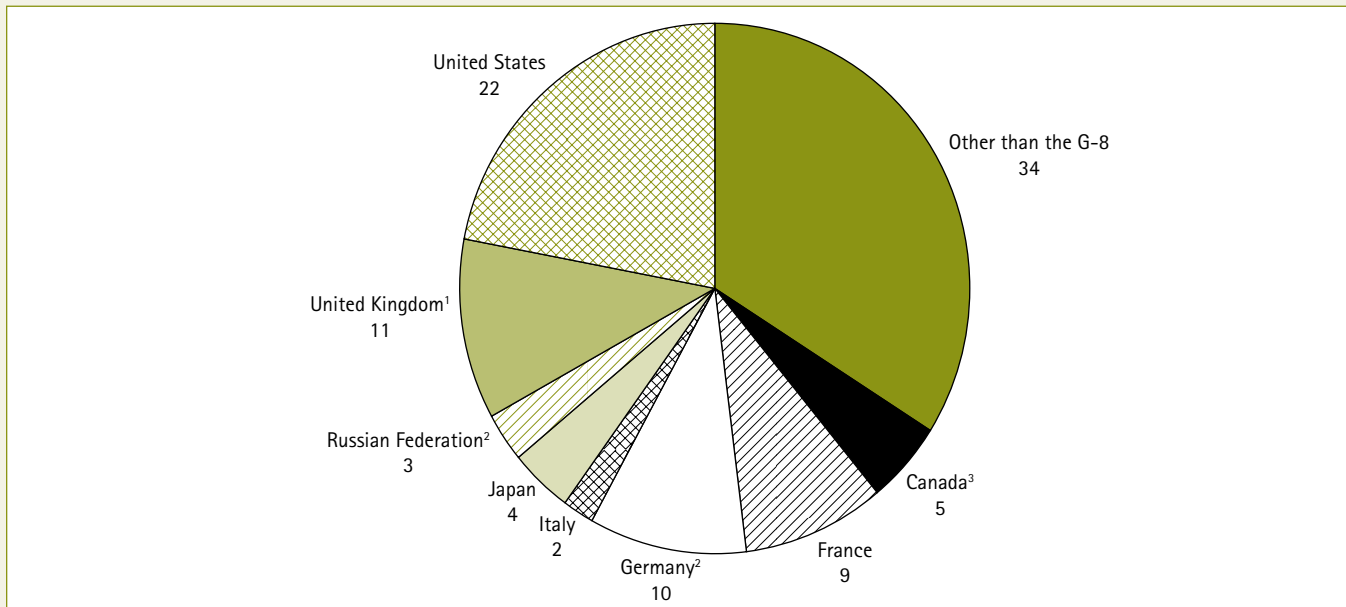
With the exception of the Russian Federation, all of the G-8 countries had a greater percentage of students coming into the country than going abroad to study. The percentage of students enrolled in higher education and going abroad to study was between 1 and 2 percent for all of the G-8 countries.

Definitions and Methodology

Foreign students are defined as noncitizens enrolled in education programs in a host country (thus, some permanent residents are included). As shown in the figures, education levels are defined accord-

ing to the International Standard Classification of Education (ISCED). For more information on the ISCED levels, see appendix A.

Figure 3a. Percentage distribution of foreign students enrolled in higher education programs, by country of destination: 2004



¹The United Kingdom includes England, Northern Ireland, Scotland, and Wales.

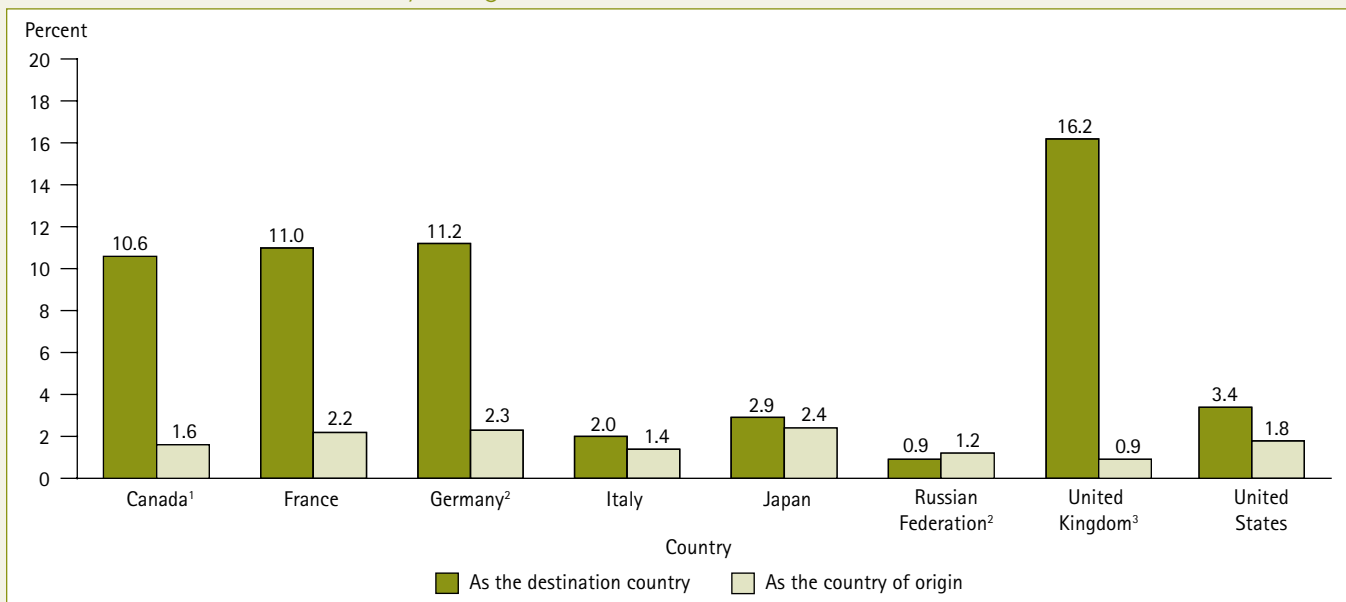
²Excludes advanced research programs (i.e., doctoral level of academic higher education).

³Reference year is 2002 rather than 2004.

NOTE: Foreign students are defined as noncitizens enrolled in education programs in a host country (thus, some permanent residents are included). Data show the percentage of enrolled foreign students in each G-8 country of destination. Countries of origin include 30 OECD countries, 177 non-OECD countries, and some nonspecified countries. Education levels are defined according to the International Standard Classification of Education (ISCED). Except where otherwise noted, data shown include ISCED levels 5A (academic higher education below the doctoral level), 5B (vocational higher education), and 6 (doctoral level of academic higher education). For more information on the ISCED levels, see appendix A in this report.

SOURCE: Organization for Economic Cooperation and Development (OECD). (2006). *Education at a Glance: OECD Indicators 2006*, table C3.8. Paris: Author.

Figure 3b. Foreign students as a percentage of all students enrolled in higher education programs, by country of destination and country of origin: 2004



¹Reference year is 2002 rather than 2004.

²Excludes advanced research programs (i.e., doctoral level of academic higher education).

³The United Kingdom includes England, Northern Ireland, Scotland, and Wales.

NOTE: Foreign students are defined as noncitizens enrolled in education programs in a host country (thus, some permanent residents are included). Countries of origin include 30 OECD countries, 177 non-OECD countries, and some nonspecified countries. Education levels are defined according to the International Standard Classification of Education (ISCED). Except where otherwise noted, data shown include ISCED levels 5A (academic higher education below the doctoral level), 5B (vocational higher education), and 6 (doctoral level of academic higher education). For more information on the ISCED levels, see appendix A in this report.

SOURCE: Organization for Economic Cooperation and Development (OECD). (2006). *Education at a Glance: OECD Indicators 2006*, tables C3.1 and C3.2. Paris: Author.

