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INTRODUCTION

THE 2002 EDITION OF EDUCATION AT A GLANCE

The OECD indicators represent the consensus of professional thinking on how to measure the current state of education internationally.

Education at a Glance – OECD Indicators 2002 provides a rich, comparable and up-to-date array of indicators that reflect a consensus among professionals on how to measure the current state of education internationally. They provide information on the human and financial resources invested in education, on how education and learning systems operate and evolve, and on the returns to educational investments. The indicators are organised thematically, and each is accompanied by background information. The 2002 edition of *Education at a Glance* adds three important improvements to its predecessors:

Comparable information on learning outcomes adds a new dimension to the OECD indicators,...

OECD's Programme for International Student Assessment (PISA), which governments launched to monitor student performance regularly within an internationally agreed framework, provides now comparable information on the outcomes of education and learning as well as on key factors shaping these outcomes. Such information has long been a critical gap in the indicator set. PISA aims to provide a new basis for policy dialogue such that countries can work together to define educational goals that are both innovative and realistic, and that reflect judgements concerning the skills that are relevant to adult life. PISA is part of a shift in focus from education inputs and institutions to outcomes. The shift is designed to support policy-makers as they attempt to improve schooling that prepares young people for adult life during an era of rapid change and increasing global interdependence.

...better information on disparities in individual and institutional performance improves the examination of equity issues in the provision and outcomes of education,...

A growing proportion of the indicators now looks beyond aggregate country performance and incorporates variations within countries that allow an examination of issues of equity in the provision and outcomes of education on dimensions such as gender, age, socio-economic background, type of institution, or field of education.

...and a new organising framework for the indicators makes them easier to use.

The OECD education indicators are being progressively integrated into a new framework. This framework:

- distinguishes between the actors in education systems: individual learners, instructional settings and learning environments, educational service providers, and the education system as a whole;
- groups the indicators according to whether they speak to learning outcomes for individuals and countries, policy levers or circumstances that shape these outcomes, or to antecedents or constraints that set policy choices into context; and
- identifies the policy issues to which the indicators relate, with three major categories distinguishing between the quality of educational outcomes and educational provision, issues of equity in educational outcomes and educational opportunities, and the adequacy and effectiveness of resource management.

The following matrix describes the first two dimensions:

	Education and learning outputs and outcomes	Policy levers and contexts shaping educational outcomes	Antecedents or constraints that contextualise policy
Individual participants in education and learning	1. The quality and distribution of individual educational outcomes	5. Individual attitudes, engagement, and behaviour	9. Background characteristics of the individual learners
Instructional settings	2. The quality of instructional delivery	6. Pedagogy and learning practices and classroom climate	10. Student learning conditions and teacher working conditions
Education providers	3. The output of educational institutions and institutional performance	7. School environment and organisation	11. Characteristics of the service providers and their communities
Education system as a whole	4. The overall performance of the education system	8. System-wide institutional settings, resource allocations, and policies	12. The national educational, social, economic, and demographic context

CONTENTS AND HIGHLIGHTS

The 2002 edition of *Education at a Glance* is divided into four chapters.

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

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

Chapter A begins by examining graduation rates in upper secondary and tertiary levels of education (**Indicators A1** and **A2**). These indicators speak both to the institutional and the system-level output of education systems. To gauge progress in educational output, current graduation rates are compared to the educational attainment of older persons who left the education system at different points in time.

Countries' progress is also reviewed in closing the gender gap in educational attainment and graduation rates, both overall and across different fields of education (**Indicators A1, A2** and **A4**).

Dropout and survival rates (**Indicator A2**) provide some indication of the internal efficiency of education systems. Students leave educational programmes before their completion for many reasons - they realise that they have chosen the wrong subject or educational programme, they fail to meet the standards set by their educational institution, or they may want to work before completing their programme. Nevertheless, high dropout rates indicate that the education system is not meeting the needs of its clients. Students may find that the educational programmes do not meet their expectations or their needs in order to enter the labour market, or that the programmes require more time outside the labour market than they can justify.

- The proportion of individuals in the population who have not completed upper secondary education has been falling in almost all OECD countries, and rapidly in some. In all but five OECD countries, the ratio of upper secondary graduates to the population at the typical age of graduation now exceeds 70 per cent, and in many countries, it exceeds 90 per cent (p. 32).
- An average of 26 per cent of persons at the typical age of graduation complete the tertiary-type A level of education. This figure ranges from about one-third or more in Australia, Finland, Iceland, Poland, the United Kingdom and the United States, to less than 20 per cent in Austria, the Czech Republic, Denmark, Germany, Italy and Switzerland (p. 42).
- Among older age groups, women have attained lower levels of upper secondary education than men, but for younger people, this pattern is now reversing. Today, graduation rates for women exceed those for men in most countries (p. 34).
- 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 it is less than one-third in mathematics and science and less than one-quarter in engineering, manufacturing and construction (p. 58).
- The adult population now possesses a greater stock of university-level skills, but most of this increase is due to significant increases in tertiary graduation rates in a comparatively small number of countries (p. 43).
- On average, one-third of OECD students drop out before they complete their first tertiary-level degree (p. 44).

...the quality of learning outcomes...

Counting the numbers of graduates alone does not inform us about the quality of learning outcomes. To address this, **Indicators A5** and **A6** reflect the reading, mathematical and scientific literacy of 15-year-old students both with regard to the relative performance of countries and to the equality of learning outcomes within each country. Reading, mathematics and science are viewed as important basic skills in all OECD countries and student assessments in these areas therefore provide essential indicators for gauging the quality of educational performance. Nevertheless, there is a growing acknowledgement that there are a much wider range of competencies that are important for the success of individuals and societies. **Indicator A8** begins to address this with a comparative review of civic knowledge and attitudes of 14-year-olds.

- On average across OECD countries, 10 per cent of 15-year-olds have acquired Level 5 literacy skills, which involve evaluating information and building hypotheses, drawing on specialised knowledge, and accommodating concepts contrary to expectations. The 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 6 per cent fall even below that (p. 65).
- 15-year-olds in Japan have the highest mean scores in mathematical literacy. Their scores cannot be distinguished statistically, however, from those of students in Korea and New Zealand, two other top-performing countries. In scientific literacy, students in Korea and Japan demonstrate the highest average performance (p. 76).
- The difference in mean performance between countries is large, but the variation in the performance of 15-year-olds within each country is many times larger. Wide disparities in performance are not a necessary condition for a country to attain a high level of overall performance, however. Five of the countries with the smallest variation in mathematical literacy – Canada, Finland, Iceland, Japan and Korea – all perform well overall (p. 78).
- Generally, 14-year-olds consider that obeying the law and voting are very important adult responsibilities. They also value activities that promote human rights, protect the environment, and benefit the community. They give less value to engaging in political discussions or joining a political party (p. 92).

...and how this varies between schools and students...

Indicators A5 and **A6** show that, in most countries, there are considerable differences in performance within each education system. This variation may reflect differences in school and student backgrounds, the human and financial resources available to schools, curricular differences, selection policies and practices, or the way that teaching is organised and delivered.

Some countries have non-selective school systems that seek to provide all students with the same opportunities for learning, and allow each school to cater to all levels 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. Other countries combine the two approaches. Even in comprehensive school systems, schools may vary significantly in response to the socio-economic and cultural characteristics of the communities that they serve or their geography. **Indicator A7** sheds light on such performance differences between schools and the factors to which these relate.

- 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 (p. 85).

- Some variation between schools can be attributed to geography, institutional factors, or the selection of students by ability. Differences are often compounded by family background, particularly in countries with differentiated school systems, since results are associated not only with individual students' backgrounds but, to a greater extent, with the backgrounds of other students (p. 87).

...equity in educational opportunities and outcomes...

Students come from a variety of socio-economic and cultural backgrounds. Schools must therefore provide appropriate and equitable opportunities for a diverse student body. Diverse backgrounds and interests can enhance a learning environment but heterogeneous levels of ability and differences in school preparedness increase the challenges of meeting the needs of students from very different socio-economic backgrounds.

To pursue this policy issue, **Indicators A9** and **A10** examine the relationship between student performance in reading literacy and their parents' occupational status, place of birth, and the language spoken at home. Although these characteristics do not lend themselves directly to educational policy, identifying the characteristics of the students most likely to perform poorly can help educators and policy-makers locate areas for policy intervention. If it can be shown that some countries find it easier than others to accommodate different background factors, important policy insights can be generated and used in other countries.

- 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 (p. 99).
- Socio-economic background remains one of the most powerful factors influencing performance. Some countries, however, most notably Canada, Finland, Iceland, Ireland, Japan and Korea, demonstrate that high average quality and social equity in educational outcomes can go together (p. 99).
- 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, but the disadvantage varies widely across countries (p. 105).
- Not surprisingly, students who do not speak the majority language at home perform much less well than students who do. In all countries, these students are much more likely to score among the lowest quarter of students, but again, the disadvantage varies widely across countries (p. 106).

...and the returns to education for individuals and society.

As levels of skill tend to rise with educational attainment, the social 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. **Indicators A11** and **A12** examine the relationship between educational attainment and labour force activity, comparing rates of participation in the labour force first, and then rates of unemployment.

Markets also provide incentives to individuals to develop and maintain appropriate levels of skills through wage differentials, especially through higher earnings for persons completing additional education. Acquiring higher levels of education can also be viewed as an investment in human capital, which includes the stock of skills that individuals maintain or develop, through education or training, and then offer,

in return for earnings, on the labour market. The higher the earnings from increased human capital, the higher the returns on the investment and the premium paid for enhanced skills and/or higher productivity. Indicators **A13** and **A14** seek to measure the returns to education for individuals, in terms of higher earnings; for taxpayers, in terms of higher fiscal income from better educated individuals; and for economies more generally, in terms of the relationship between education and economic growth. Together, these indicators shed light on the longer-term impact of education for individuals and societies.

- Labour force participation rates rise with educational attainment in most OECD countries. With very few exceptions, graduates of tertiary education have markedly higher participation rates than upper secondary graduates. The gap in male participation rates is particularly wide between upper secondary graduates and those with no upper secondary qualification (p. 112).
- Although there is a gender gap in labour force participation for those with tertiary educational attainment, the gap is much narrower than for those with lower qualifications (p. 113).
- A 15-year-old 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. Countries vary most in terms of the average length of periods of unemployment, which primarily reflects differences in youth employment rates (p. 120).
- Education and earnings are positively linked, and this link is particularly pertinent in upper secondary education, which constitutes a watershed in many countries. Education beyond upper secondary brings a particularly high premium and, while women still earn less than men with similar levels of educational attainment, the differences are smaller at higher levels (p. 124).
- In all countries, the private rate of return to investment in education is higher than real interest rates, and often significantly so. 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 (p. 127).
- Earnings differentials and the length of education tend to be the prime determinants of the returns, but there are other factors, including taxes which reduce the returns, lower risks of unemployment which increase the returns, tuition fees which reduce the returns, and public grant or loan arrangements which boost returns (p. 128).
- The improvement in human capital has been a strong and common factor behind economic growth in recent decades, and in some countries accounted for more than half a percentage point of growth in the 1990s (p. 136).

Chapter B considers the financial and human resources invested in education, in terms of...

Financial resources are a central policy lever for improving educational outcomes. As an investment in human skills, education can help to foster economic growth and enhance productivity, contribute to personal and social development, and reduce social inequality. But like any investment, education has returns and costs. After Chapter A examined the returns to education, Chapter B provides a comparative examination of spending patterns in OECD countries. By giving more emphasis to trends in spending patterns, *Education at a Glance 2002* analyses how different demand and supply factors interact and how spending on education, compared to spending on other social priorities, has changed.

...the resources that each country invests in education relative to its number of students enrolled...

Effective schools require the right combination of trained and talented personnel, adequate facilities, state-of-the-art equipment, and motivated students ready to learn. The demand for high-quality education, however, can translate into higher costs per student, and must therefore be weighed against undue burdens for taxpayers. No absolute standards exist for measuring the per student resources needed to ensure optimal returns for individual students or society as a whole. Nonetheless, international comparisons can

provide a starting point for discussion by evaluating the variation that exists between OECD countries in educational investment. **Indicator B1** examines direct public and private expenditure on educational institutions in relation to the number of their full-time equivalent (FTE) students. It also reviews how OECD countries apportion per capita education expenditure between different levels of education.

- As a whole, OECD countries spend US\$ 4 229 per primary student, US\$ 5 174 per secondary student, and US\$ 11 422 per tertiary student. These averages mask a broad range of expenditure across countries, however (p. 148).
- On average, OECD countries spend 2.3 times as much per student at the tertiary level as at the primary level (p. 154).
- In some OECD countries, low annual expenditure per tertiary-level student still translates into high overall costs of tertiary education, because of the length of studies (p. 154).
- At the tertiary level, education spending has not always kept pace with rapidly expanding enrolments.
- Lower unit expenditure cannot automatically be equated with poorer quality educational services. Australia, Finland, Korea and the United Kingdom, for example, which have moderate per student education expenditure at primary and lower secondary levels, are among the OECD countries with 15-year-old students performing best in mathematics (p. 150).

...and relative to national income and the size of public budgets,...

Indicator B2 examines the proportion of national resources that goes to educational institutions and the levels of education to which they go. The proportion of national financial resources allocated to education is one of the key choices made by each OECD country; it is an aggregate choice made by governments, enterprises, and individual students and their families. **Indicator B2** also shows how the amount of educational spending relative to the size of national wealth and in absolute terms has evolved over time in OECD countries.

Indicator B3 completes the picture of the resources invested in education by examining changes in public spending on education in absolute terms and relative to changes in overall public spending. All governments are involved in education, funding or directing the provision of services. Since markets offer no guarantee of equal access to educational opportunities, governments fund educational services to ensure that they are within the reach of their populations. Public expenditure on education as a percentage of total public expenditure indicates the value of education relative to the value of other public investments such as health care, social security, defence and security.

- OECD countries spend 5.8 per cent of their collective GDP on their educational institutions (p. 162).
- In 14 of 18 OECD countries, public and private investment in education increased by more than 5 per cent between 1995 and 1999 (p. 163).
- On average, OECD countries devote 12.7 per cent of total public expenditure to educational institutions (p. 175).
- In real terms, public expenditure on education increased by more than 5 per cent in four out of five OECD countries between 1995 and 1999 (p. 177).
- Public expenditure on education tended to grow faster than total government spending, but not as fast as GDP. In Italy, the Netherlands, Sweden and the United Kingdom, public expenditure on education increased between 1995 and 1999, despite falling public budgets in real terms (p. 177).

...the ways in which education systems are financed, and the sources of the funds,...

Cost-sharing between the participants in education and society as a whole is an issue that is under discussion in many OECD countries. This is a particularly relevant question at the early and late stages of education – pre-primary and tertiary – where full or nearly full public funding is less common. As new client groups participate in education, the range of educational opportunities, programmes and providers is growing, and governments are forging new partnerships to mobilise the necessary resources. Public funding is now being looked upon increasingly as providing only a part, albeit a very substantial part, of the investment in education. Private funding is playing an increasingly important role. To shed light on these issues, **Indicator B4** examines the relative proportions of funds for educational institutions from public and private sources, and how these figures have evolved since 1995.

New funding strategies aim not only at mobilising the required resources from a wider range of public and private sources, but also at providing a broader range of learning opportunities and improving the efficiency of schooling. In the majority of OECD countries, publicly funded primary and secondary education is also organised and delivered by public institutions. However, in a fair number of OECD countries the public funds are then transferred to private institutions or given directly to households to spend in the institution of their choice. In the former case, the final spending and delivery of education can be regarded as subcontracted by governments to non-governmental institutions, whereas in the latter instance, students and their families are left to decide which type of institution best meets their requirements. Also the allocation of funds between public and private sources is examined in **Indicator B4**.

- The private share of total payments to educational institutions ranges from about 3 per cent or less in Finland, Norway, Portugal, the Slovak Republic, Sweden and Turkey to as much as 40 per cent in Korea (p. 182).
- In some OECD countries, governments pay most primary and secondary education costs, but leave the management of educational institutions to the private sector to broaden the range of learning opportunities without limiting the participation of students from low-income families. In Belgium and the Netherlands, the majority of primary and secondary students are enrolled in such government-dependent private institutions. In Australia, France, Korea, Spain and the United Kingdom, the proportion is still more than 20 per cent (p. 182).
- Very few primary and secondary educational institutions are financed predominantly by households as compared to governments (p. 183).
- Tertiary institutions tend to mobilise a far higher proportion of their funds from private sources than do primary, secondary and post-secondary non-tertiary institutions. The share ranges from 3 per cent or less in Austria, the Flemish Community of Belgium, Denmark, Finland, Greece and Switzerland, to 78 per cent in Korea (p. 185).
- In ten out of 19 OECD countries, private expenditure on tertiary education grew by more than 30 per cent between 1995 and 1999. In most countries, however, this growth in private spending was not associated with a decrease in public-sector spending on tertiary education (p. 185).

...different financing instruments...

The primary financing mechanism of education in most OECD countries remains direct spending on educational institutions. However, governments are looking increasingly towards greater diversity in financing instruments. Comparing these instruments helps to identify policy alternatives. Subsidies to students and their families, the subject of **Indicator B5**, constitute one such alternative to direct spending on institutions. Governments subsidise the costs of education and related expenditure in order to increase access to education and reduce social inequalities. Furthermore, public subsidies play an important role

in indirectly funding educational institutions. Channelling institutional funding through students may heighten institutional competition and therefore the efficiency of education funding. Since aid for student living costs can also serve as a substitute for work as a financial resource, public subsidies may enhance educational attainment by enabling students to study full-time and to work fewer hours or not at all.

Public subsidies come in many forms: means-based subsidies, family allowances for all students, tax allowances for students or parents, or other household transfers. Should household subsidies take the form of grants or loans? Do loans effectively help increase the efficiency of financial resources invested in education and shift some of the costs to the beneficiaries? Or are student loans less appropriate than grants for encouraging low-income students to pursue their education? **Indicator B5** cannot answer these questions, but it does provide a useful overview of the subsidy policies being pursued in different OECD countries.

- An average of 16 per cent of public spending on tertiary education goes, in the form of subsidies, to supporting students, households and other private entities. In Australia, Denmark and the United Kingdom, public subsidies account for one-third or more of public tertiary education budgets (p. 194).
- Subsidies are particularly important in systems where students are expected to pay at least part of their education costs (p. 196).
- In most OECD countries, the beneficiaries of public subsidies enjoy considerable discretion in spending them. In all reporting OECD countries, subsidies are spent mainly outside educational institutions, and in one out of three countries, they are spent exclusively outside (p. 196).

...and how the money is invested and apportioned among different resource categories.

Chapter B concludes with an examination of how financial resources are invested and apportioned among resource categories (**Indicator B6**). The allocation of resources can influence the quality of instruction (through the relative expenditure on teachers' salaries, for example), the condition of educational facilities (through expenditure on school maintenance), and the ability of the education system to adjust to changing demographic and enrolment trends. A comparison of how OECD countries apportion their educational expenditure among resource categories can provide some insight into the differences in organisational structure and operation of educational institutions. Systemic budgetary and structural decisions on allocating resources eventually make themselves felt in the classroom; they affect teaching and the conditions under which teaching takes place.

- On average, one-quarter of the expenditure on tertiary education is earmarked for R&D at tertiary educational institutions. OECD countries differ significantly in how they emphasise R&D in tertiary institutions, which explains part of the wide differences in expenditure per tertiary student (p. 202).
- Expenditure on ancillary services at primary, secondary and post-secondary non-tertiary levels represent, on average, 5 per cent of total spending on educational institutions. This is usually more than what OECD countries spend on household subsidies (p. 202).
- In primary, secondary and post-secondary non-tertiary education combined, current expenditure accounts for 92 per cent of total spending on average across all OECD countries. In all but four OECD countries, 70 per cent or more of current expenditure goes to staff salaries (p. 203).
- At the tertiary level, OECD countries tend to devote a higher proportion of current expenditure to services that are sub-contracted or bought in (p. 205).

Chapter C looks at access to education, participation and progression, in terms of...

A well-educated population has become a defining feature of a modern society. Education is seen as a mechanism for instilling civic values, and as a means for developing individuals' productive and social capacity. Early childhood programmes prepare young children socially and academically for primary education. Primary and secondary education provides basic skills that serve as a foundation for young people to become productive members of society. Tertiary education provides opportunities for acquiring advanced knowledge and skills, either immediately after initial schooling or later. Many employers encourage ongoing training, and assist workers in upgrading or re-orienting their skills to meet the demands of changing technologies. Chapter C sketches a comparative picture of access, participation and progression in education across OECD countries.

...the expected duration of schooling, overall and at the different levels of education,...

Indicators on the expected duration of schooling, and on enrolment rates at different educational levels (**Indicator C1**) can help to elucidate the structure of education systems and access to educational opportunities in them. Enrolment trends at the different education levels and types of institutions show how education supply and demand are balanced in different countries.

- In 25 of 27 OECD countries, individuals participate in formal education for between 15 and 20 years, on average. Most of the variation comes from differences in upper secondary enrolments (p. 215).
- School expectancy increased between 1995 and 2000 in 18 out of 20 OECD countries. In Australia, the Czech Republic, Finland, Greece, Hungary, Korea, Poland and the United Kingdom, the increase exceeded one year over this relatively short period (p.216).
- In two-fifths of OECD countries, more than 70 per cent of three to four-year-olds are enrolled in either pre-primary or primary programmes. At the other end of the spectrum, a 17-year-old can expect to spend an average of 2.5 years in tertiary education (p. 216).
- In the majority of OECD countries, women can expect to receive more years of education than men – an additional 0.5 years, on average. However, in Korea, Switzerland and Turkey, men can expect to have between 0.7 to 2.8 more years of education (p. 216).

...entry to and participation in different types of educational programmes and institutions,...

Virtually all young people in OECD countries can expect to go to school for 11 years. However, participation patterns and progression through education vary widely. Both the timing and participation rate in pre-school and after the end of compulsory education differ considerably between countries. Some countries have extended participation in education, for example, by making pre-school education almost universal by the age of three, by retaining the majority of young people in education until the end of their teens, or by maintaining 10 to 20 per cent participation among up to the late 20s. High tertiary entry and participation rates help to ensure the development and maintenance of a highly educated population and labour force. Rates of entry to both types of tertiary education (**Indicator C2**) are an indication, in part, of the degree to which the population is acquiring high-level skills and knowledge valued by the labour market in knowledge societies.

While the successful graduation from upper secondary education is becoming the norm in most OECD countries, routes to it are becoming increasingly varied. Upper secondary programmes can differ in their curricular content, often depending on the type of further education or occupation for which the programmes are intended to prepare students. Most upper secondary programmes in OECD countries are primarily designed to prepare students for further studies at the tertiary level. The orientation of these

programmes can be general, pre-vocational or vocational. Besides the programmes primarily preparing students for further education, in most OECD countries there are also upper secondary programmes designed to prepare students for direct entry to the labour market. Enrolment in these different types of educational programmes is also examined in **Indicator C2**.

- Today, four out of ten school leavers are likely to attend tertiary programmes leading to the equivalent of a bachelors' or higher tertiary-type A degree. In some OECD countries, the figure can be as high as one of every two school leavers (p. 223).
- With the exception of France, Germany and Turkey, participation in tertiary education grew in all OECD countries between 1995 and 2000; in the majority of OECD countries by more than 15 per cent, and in the Czech Republic, Hungary, Korea and Poland by more than 50 per cent (p. 225).
- The majority of students in primary and secondary education are enrolled in public institutions. However, 11 per cent of primary level students, 14 per cent of lower secondary level students, and 19 per cent of upper secondary level students, on average, are enrolled in privately managed schools. At all levels, the majority of students in Belgium and in the Netherlands are enrolled in privately managed schools, and in Korea and the United Kingdom, the majority of students in upper secondary education are enrolled in privately managed schools (p. 229).
- In most OECD countries, the majority of tertiary students are enrolled in public institutions. However, in Belgium, Japan, Korea, the Netherlands and the United Kingdom, privately managed institutions enrol the majority of students (p. 229).

...learning beyond initial education...

There is ample evidence that more secondary and tertiary education for young people improves their individual economic and social prospects. There is also growing, albeit less direct evidence, of a pay-off for societies at large from having a more highly educated population (**Indicators A13** and **A14**). But as rapidly changing technology and globalisation transform the pattern of demand for skilled labour worldwide, increasing the proportion of young people who participate in upper secondary or higher education can only be one part of the solution, for several reasons. First, an inflow of better-educated young people can only gradually change the overall educational level of the existing workforce. Second, educational attainment is only one component of human capital accumulation since knowledge and skills continue to be acquired lifelong, not only in education settings but also through family life, from experience with communities and in business. Strategies for developing lifelong learning opportunities must therefore look beyond mainstream educational programmes and qualifications if they are to ensure optimal investment in human capital. **Indicator C4** brings together evidence from the International Adult Literacy Survey (1994-1998) and national household surveys on adult education and training, which both provide some understanding of participation in job-related education and training of the employed.

- For half of the reporting OECD countries, more than 40 per cent of the adult population participated in some form of continuing education and training within a 12-month period (p. 248).
- The incidence and intensity of continuing education and training varies greatly between OECD countries. Participation rates range from 18 per cent or lower in Hungary, Poland and Portugal, to more than 50 per cent in Denmark, Finland, Sweden and the United States (p. 248).
- In 11 out of the 19 OECD countries, adults with tertiary qualifications are between two and three times more likely to participate in job-related training than adults who have not completed upper secondary education; thus education combines with other influences to make adult training least common among those who need it most (p. 248).

- Women with lower levels of educational attainment tend to receive less job-related continuing education and training but the pattern becomes less pronounced for women with upper secondary and tertiary qualifications (p. 248).

...and cross-border movements of students.

The international dimension of higher education is receiving more and more attention. The general trend towards freely circulating capital, goods and people, coupled with changes in the openness of labour markets, have increased the demand for new kinds of skills and knowledge in OECD countries. Governments are looking increasingly to higher education to play a role in broadening the horizons of students and allowing them to develop a deeper understanding of the multiplicity of languages, cultures and business methods in the world.

One way for students to expand their knowledge is to attend higher educational institutions in countries other than their own. International student mobility involves costs and benefits to students and institutions in sending and host countries alike. While the direct short-term monetary costs and benefits of this mobility are relatively easy to measure, the long-term social and economic benefits to students, institutions and countries are more difficult to quantify. The number of students studying in other countries (**Indicator C3**), however, provides some idea of the extent of student mobility.

- Five countries (Australia, France, Germany, the United Kingdom and the United States) attract seven out of ten foreign students studying in the OECD area (p. 237).
- In absolute numbers, Greek, Japanese and Korean students represent the largest sources of foreign students from OECD countries, while students from China and Southeast Asia make up the largest numbers of foreign students from non-OECD countries (p. 239).
- In relative terms, foreign students in OECD countries constitute from below 1 per cent to almost 17 per cent of tertiary enrolments. Proportional to their size, Australia, Austria, Belgium, Switzerland and the United Kingdom show the largest proportions of foreign students, measured as a percentage of their tertiary enrolments (p. 240).

Chapter D examines the learning environment and organisation of schools, in terms of...

Chapters A, B and C examined financial resources invested in education, patterns of participation, and the results of education in terms of student achievement and the labour market outcomes of education. Chapter D now looks at teaching and learning conditions in education systems. Learning in schools is mostly organised in classroom settings where teachers are the primary agents for planning, pacing and monitoring learning. In the first five indicators, school conditions are analysed from the learners' point of view, while the last two indicators present system-level information on the working conditions of the teaching force.

...student learning conditions,...

How effectively learning time is used depends on how appropriate study programmes are, and on how much instruction time a student receives. **Indicator D1** examines instruction time available for various study areas for students between 9 and 14 years of age. The size of the learning group that shares teacher time is another variable for measuring the use of classroom learning time. **Indicator D2** looks at the variation in average class size, and the ratio of students to teaching staff across OECD countries to estimate the human resources available for individual students.

- Students between the ages of 9 and 11 spend an average of 841 hours per year in the classroom. Students between the ages of 12 and 14 spend nearly 100 hours more, although the figures vary significantly across countries (p. 279).
- On average across countries, reading and writing in the language of instruction, mathematics, and science, comprise about half the compulsory curriculum for 9 to 11 year-olds, and 40 per cent for 12 to 14-year-olds (p. 279).
- 15-year-old students spend an average of 4.6 hours per week on homework and learning in the language of instruction, mathematics and science in addition to instruction time spent in the classroom (p. 280).
- On average, one in three 15-year-olds receive, at least occasionally, private tutoring or private instruction (p. 281).
- The average class size in primary education is 22 students, but the figure varies from 36 students in Korea to fewer than half that number in Greece, Iceland and Luxembourg (p. 288).

...the availability and use of information technology at school and at home...

In addition to classroom time and human resources, new technologies assume an increasingly important role in education. They not only equip students with important skills to participate effectively in the modern world, but also foster the development of self-regulated learning strategies and skills, as part of an essential foundation for lifelong learning. The mere presence of modern information and communication technology (ICT) in schools does not guarantee its effective use, but its availability is critical for improving teaching and learning conditions in schools and for providing equitable education for all. **Indicator D3** looks at the availability of ICT in students' homes and schools, and the use of technology in teaching and learning. **Indicator D4** goes further by analysing the attitudes and experiences of young males and females in using information technology.

- On average across countries, the typical 15-year-old attends a school with 13 students for one computer but this varies widely across countries and, in some countries, between regions and schools (p. 296).
- On average across countries, about one-third of 15-year-old students reported using a computer at school daily or at least a few times per week but the frequency of using a computer at home is almost double this. However, the percentage of 15-year-olds who say that they never have a computer available to them is 10 percentage points higher for the home than for school, which suggests that schools may play an important role in bridging the educational gap between the "information have and have-nots" (p. 297).
- On average in OECD countries, 15-year-old males are significantly more confident in their perceived ability to use computers than females. Gender differences are greatest in Denmark, Finland and Sweden, and smallest in Australia, New Zealand, Scotland and the United States (p. 309).
- With the exception of Ireland, Mexico and the United States, 15-year-old males report significantly higher levels of interest in computers than females (p. 309).

...classroom and school climate ...

Teachers act as professionals with a relatively high degree of freedom to organise students' learning activities and to evaluate their progress. Their subject knowledge, pedagogical skills, discipline, enthusiasm and commitment are important for determining the learning climate of the classroom and, more generally, the school. Other factors such as student discipline, the availability of educational resources, and school autonomy also influence the working climate of the school which, in turn, significantly affects education outcomes. **Indicator D5** first examines those aspects of classroom climate that appear to favour learning

of 15-year-olds, and the differences between countries with respect to these. Next, the indicator presents indices on the working climate of schools showing patterns of differences between countries with respect to relevant school climate factors.

- Compared to the OECD mean, 15-year-olds in Australia, Canada, New Zealand, Portugal, Sweden, the United Kingdom and the United States reported receiving more support from their teachers than those in Austria, Belgium, the Czech Republic, Germany, Italy, Korea, Luxembourg and Poland (p. 318).
- On average across countries, one 15-year-old in three reported that more than five minutes are spent at the start of the class doing nothing; more than one in four complained about noise and disorder (p. 318).
- More than half the 15-year-olds in Australia, Denmark, Ireland, New Zealand, Norway, Sweden and the United Kingdom reported that they regularly use the science laboratory compared to less than 10 per cent in Finland and Hungary (p. 320).
- School resources tend to be used more frequently, schools tend to have a higher level of autonomy, teachers' morale and commitment tend to be higher, and teacher-student relations tend to be relatively better in high performing countries, whereas in countries with relatively low performance, negative school climate indices tend to cluster, and the indices on the use of school resources, teachers' morale and commitment, school autonomy and teacher-student relations tend to fall below the OECD average (p. 322).

...and teachers' working conditions.

Chapter D concludes with a comparative review of teachers' working conditions. Education systems employ a large number of professionals in increasingly competitive market conditions. Ensuring a sufficient number of skilled teachers is a key concern in all OECD countries. Key determinants of the supply of qualified teachers are the salaries and working conditions of teachers, including starting salaries and pay scales, and the costs incurred by individuals to become teachers, compared with salaries and costs in other occupations. Both affect the career decisions of potential teachers and the types of people attracted to the teaching profession. At the same time, teachers' salaries are the largest single factor in the cost of providing education. Teacher compensation is thus a critical consideration for policy-makers seeking to maintain the quality of teaching and a balanced education budget. The size of education budgets naturally reflects trade-offs between a number of interrelated factors, including teachers' salaries, the ratio of students to teaching staff, the quantity of instruction time planned for students, and the designated number of teaching hours. To shed light on these issues, **Indicator D6** shows the starting, mid-career and maximum statutory salaries of teachers in public primary and secondary education, and incentive schemes and bonuses used in teacher rewards systems.

Together with class size and the ratio of students to teaching staff (**Indicator D2**), hours of instruction for students (**Indicator D1**) and teachers' salaries (**Indicator D6**), the amount of time that teachers spend in the classroom teaching influences the financial resources which countries need to invest in education. While the number of teaching hours and the extent of non-teaching responsibilities are important parts of a teacher's working conditions, they also affect the attractiveness of the profession itself. **Indicator D7** examines the statutory working time of teachers at different levels of education, as well as the statutory teaching time, *i.e.*, the time that full-time teachers are expected to spend teaching students. Although working time and teaching time only partly determine the actual workload of teachers, they do give some insight into differences between countries in what is demanded of teachers.

- The mid-career salaries of lower secondary teachers range from less than US \$ 10 000 in the Czech Republic and Hungary to US \$ 40 000 and more in Germany, Japan, Korea, Switzerland and the United States. Some countries make a major investment in human resources despite lower levels of national income (p. 332).
- An upper secondary teacher's salary per contact hour is, on average, 42 per cent higher than that of a primary teacher. This difference in compensation per teaching hour between these two levels is 10 per cent or less in Australia, New Zealand, Scotland and the United States, and more than 80 per cent in Spain and Switzerland (p. 334).
- Teachers in Australia, Denmark, England, New Zealand and Scotland reach the highest step on the salary scale in 11 years or less. More than 30 years of service are required for a teacher to reach the maximum salary level in Austria, the Czech Republic, France, Greece, Hungary, Italy, Japan, Korea and Spain (p. 334).
- Schools have at least some responsibility in deciding the levels and extent of compensation for additional responsibilities and overtime in about half of OECD countries (p. 335).
- Public primary school teachers teach an average of 792 hours per year; the figure ranges from 583 hours to 1 139 hours (p. 343).
- At the lower secondary level, teachers teach an average of 720 hours, but the figure ranges from 555 hours to 1 182 hours. Regulations of teachers' working time vary. In most countries, teachers are formally required to work a specific number of hours. Some countries specify teaching time in lessons per week, in others, time is set aside for non-teaching school activities, and in some countries, the hours when teachers are required to be at school are specified (p. 343).

FURTHER RESOURCES

The web site www.oecd.org/els/education/eag2002 provides a rich source of information on the methods employed for the calculation of the indicators, the interpretation of the indicators in the respective national contexts and the data sources involved. The web site also provides access to the data underlying the indicators.

The web site www.pisa.oecd.org provides information on the OECD Programme for International Student Assessment (PISA), on which many of the indicators in this publication draw.

Education Policy Analysis is a companion volume to *Education at a Glance*, which takes up selected themes of key importance for governments. The five chapters in this year's edition of *Education Policy Analysis* reviews five themes: Eight key strategies for improving access to quality early childhood education and care are identified; the characteristics of countries that achieve high quality reading skills of 15-year-olds from all social backgrounds are analysed; policies that countries can use to attract, develop and retain effective teachers are explored; and the growth of education across national borders is documented, and its challenges for national policy making discussed. In addition, a broader concept of "human capital" is developed that helps bridge the gap between education's economic mission, and its wider social and personal benefits.

READER'S GUIDE

Coverage of the statistics

Although a lack of data still limits the scope of the indicators in many countries, the coverage extends, in principle, to the entire national education system regardless of the ownership or sponsorship of the institutions concerned and regardless of education delivery mechanisms. With one exception described below, all types of students and all age groups are meant to be included: children (including students with special needs), adults, nationals, foreigners, as well as students in open distance learning, in special education programmes or in educational programmes organised by ministries other than the Ministry of Education, provided the main aim of the programme is the educational development of the individual. However, vocational and technical training in the workplace, with the exception of combined school and work-based programmes that are explicitly deemed to be parts of the education system, is not included in the basic education expenditure and enrolment data.

Educational activities classified as “adult” or “non-regular” are covered, provided that the activities involve studies or have a subject-matter content similar to “regular” education studies or that the underlying programmes lead to potential qualifications similar to corresponding regular educational programmes. Courses for adults that are primarily for general interest, personal enrichment, leisure or recreation are excluded.

Calculation of international means

For many indicators a country mean is presented and for some an OECD total.

The *country mean* is calculated as the unweighted mean of the data values of all countries for which data are available or can be estimated. The country mean therefore refers to an average of data values at the level of the national systems and can be used to answer the question of how an indicator value for a given country compares with the value for a typical or average country. It does not take into account the absolute size of the education system in each country.

The *OECD total* is calculated as a weighted mean of the data values of all countries for which data are available or can be estimated. It reflects the value for a given indicator when the OECD area is considered as a whole. This approach is taken for the purpose of comparing, for example, expenditure charts for individual countries with those of the entire OECD area for which valid data are available, with this area considered as a single entity.

Note that both the country mean and the OECD total can be significantly affected by missing data. Given the relatively small number of countries, no statistical methods are used to compensate for this. In cases where a category is not applicable (code “a”) in a country or where the data value is negligible (code “n”) for the corresponding calculation, the value zero is imputed for the purpose of calculating country means. In cases where both the numerator and the denominator of a ratio are not applicable (code “a”) for a certain country, this country is not included in the country mean.

For financial tables using 1995 data, both the country mean and OECD total are calculated for countries providing both 1995 and 1999 data. This allows comparison of the country mean and OECD total over time with no distortion due to the exclusion of certain countries in the different years.

Classification of levels of education

The classification of the levels of education is based on the revised International Standard Classification of Education (ISCED-97). The biggest change between the revised ISCED and the former ISCED (ISCED-76) is the introduction of a multi-dimensional classification framework, allowing for the alignment of the educational content of programmes using multiple classification criteria. ISCED is an instrument for compiling statistics on education internationally and distinguishes among six levels of education. The *Glossary and the notes in Annex 3 (Indicator A2)* describe in detail the ISCED levels of education, and Annex 1 shows corresponding theoretical graduation ages of the main educational programmes by ISCED level.

Symbols for missing data

Four symbols are employed in the tables and graphs to denote missing data:

- a* Data not applicable because the category does not apply.
- c* There are too few observations to provide reliable estimates (*i.e.*, there are fewer than five schools or fewer than 30 students with valid data for this cell).
- m* Data not available.
- n* Magnitude is either negligible or zero.
- x* Data included in another category or column of the table (*e.g.*, *x*(2) means that data included in column 2 of the table).

Country codes

OECD Member countries

Australia	AUS	Korea	KOR
Austria	AUT	Luxembourg	LUX
Belgium	BEL	Mexico	MEX
Belgium (Flemish Community)	BFL	Netherlands	NLD
Canada	CAN	New Zealand	NZL
Czech Republic	CZE	Norway	NOR
Denmark	DNK	Poland	POL
Finland	FIN	Portugal	PRT
France	FRA	Slovak Republic	SVK
Germany	DEU	Spain	ESP
Greece	GRC	Sweden	SWE
Hungary	HUN	Switzerland	CHE
Iceland	ISL	Turkey	TUR
Ireland	IRL	United Kingdom	UKM
Italy	ITA	United States	USA
Japan	JPN		

Countries participating in the OECD/UNESCO World Education Indicators programme

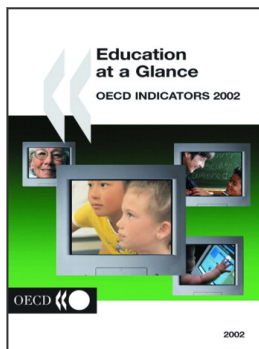
Argentina, Brazil, Chile, China, Egypt, India, Indonesia, Jamaica, Jordan, Malaysia, Paraguay, Peru, Philippines, Russian Federation, Thailand, Tunisia, Uruguay and Zimbabwe participate in the OECD/UNESCO World Education Indicators (WEI) programme. Data for these countries are collected using the same standards and methods that are applied for OECD countries and therefore included in this publication. Israel has observer status in OECD's activities on education and has contributed to the OECD indicators on educational finance.

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