

Education at a Glance 2003

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Key Findings

Many headline economic indicators fluctuate day by day. With few exceptions, commentators judge the success or failure of economic policies in quarterly data or annual growth rates. It is harder to become excited about education in the same way, since both policy and indicators measuring performance move forward at an altogether more glacial pace. True, a headline on the performance of our children in reading, mathematics or science can cause people to sit up. But it may be five or ten years, or even a generation, before policies to address these issues bear fruit. This is not surprising, when one considers that educational outcomes for students graduating from secondary school this year may be influenced by the teaching they received when they started school around 1990, possibly in classes where the teachers themselves had been trained in the 1960s.

*Yet, considering public and private spending, education not only absorbs 5.9% of GDP in the OECD area, but is a key resource in today's knowledge-driven society. So shouldn't we monitor its performance more closely? The OECD has been responding to this by collecting reliable educational indicators for over a decade, using comparable data to make it possible to track some longer term trends. Its annual compendium, *Education at a Glance*, whose latest edition has just been published, confirms that, yes, things change slowly, but gives a clear indication of the direction of change.*

Comparing some of the key data for 2000/2001 with indicators 5 or 10 years earlier shows much that remains familiar. Take spending levels.

In 14 out of 19 OECD countries, public and private spending on educational institutions increased between 1995 and 2000 by more than 5% in real terms but, in contrast to the early 1990s, increases in spending on educational institutions tended to fall behind the growth in national income. Denmark and Sweden continue to spend the most public resources on their education systems, 6.4 and 6.3% of their GDP. In the EU area and the United States public spending amounts both to 4.8% of GDP, but large private spending on education (1.8% for tertiary education and 0.4% for primary and secondary education) pushes total spending on educational institutions in the United States to 7.0% (compared with 5.3% in the EU area) and brings it close to the highest spending country. This is now Korea, again reflecting significant private spending on tertiary education. Japan remains a modest spender (4.6%), even when above-average private spending (1.2%) is taken into account.

The picture for enrolment levels has altered more. Earlier indicators for 1990 showed European countries tending to have higher participation in early childhood education, but a smaller percentage going on to obtain university qualifications than the United States, Canada or Australia. But this pattern has changed. In particular, a number of European countries, including the United Kingdom and some Nordic countries, are now educating over a third of their young people to the university level. Today's entry rates suggest that the expansion of university-level education will continue: Four out of ten school leavers in 2001 are likely to attend tertiary programmes leading to the equivalent of a bachelors' or higher university-level degree during their lifetime and in New Zealand, Finland, Sweden, Poland and Australia more than two-thirds are. This has put significant pressure on the financing of education and in eight out of 22 OECD countries spending on tertiary educational institutions has not kept pace with the expansion of enrolments, such that expenditure per tertiary student actually decreased since 1995 in real terms.

As for the education level of the workforce, the effect of such shifts is only gradual. For instance, an increase in the graduation rate among young people 10 years ago will have affected about a quarter of people presently of working age. Chart 1 shows that, nevertheless, there has been considerable movement in some countries in the proportion of well-qualified young people. Tertiary attainment among 25-34 year-olds is growing everywhere, but particularly quickly in Australia, Belgium, Canada, France, Ireland,

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Korea, Norway, Spain, Sweden and the United Kingdom, which have seen double digit growth since 1991, and which have caught up with the United States or are close to doing so. Germany and the United Kingdom each started the 1990s with about a fifth of their 25-34-year-olds highly qualified, but whereas this has not changed much in Germany, in the United Kingdom the proportion is now approaching a third. This suggests that Germany has faced difficulties in expanding access to higher education, but reform efforts now under way to replace the single five or six year diploma degree with a multi-stage degree system may alter the picture in years to come. However, note that these data measure “tertiary” education, which includes not just full university degrees, but a range of lower-level diplomas. The latter are particularly common in Japan, helping to account for its high tertiary attainment rate.

Apart from the continued expansion of education systems, several other features stand out.

The 1990s was the decade when women moved ahead of men in terms of their educational attainment. Young women are now more likely to obtain first degrees from university-level institutions in most OECD countries: only in three (Japan, Switzerland and Turkey) are young men significantly more likely to do so. In the past, men typically had better access, and earlier indicators show that in 1990 men still had higher university-level graduation rates than women in half the countries with comparable data. Nevertheless, there remain gender discrepancies in educational and career choices, with young men still favouring physics, mathematics and engineering based courses at university, and young women opting for the social sciences, health and teaching-related courses: In the humanities, arts, education, health and welfare, an average of more than two thirds of the university-level graduates are women, whereas there are less than one third in mathematics and computer science and less than one quarter in engineering, manufacturing and construction. Men are also more likely than women to earn advanced research qualifications, such as doctorates. Girls were also better readers by age 15 in every one of the 43 countries taking part in the OECD’s “PISA” survey of 15 year olds’ performance in 2000. In about half of the countries boys remained ahead in mathematical literacy, but here the differences were much smaller, and in science there were few significant differences. In 40 out of the 43 countries taking part in PISA 15-year-old girls also reported higher expectation towards their future occupations than boys. However, mirroring the picture of current graduates in universities, career expectations of boys were far more often associated with physics, mathematics or engineering (on average 18% of boys versus 5 percent of girls) while girls more frequently expected occupations related to life sciences and health (20% of girls compared to only 7% of boys).

The clearest way in which schools themselves look different today than in 1990 is the use of information and communication technology (ICT). In 1990 most upper secondary schools had yet to introduce basic computer systems for educational purposes; today, virtually every school has done so, with Internet and email coming on stream for most by the end of the decade. However, the take-up of new technologies has been far from uniform, as this year’s *Education at a Glance* shows. As shown in Chart 2, some countries like Belgium (Flemish Community), Denmark, Finland, France and Switzerland introduced ICT in upper secondary schools earlier, whereas countries like Italy, Korea and Spain did so much later.

In general, the early countries are also those who today resource it the most generously, but Korea provides a counter-example of a country that only started to invest very recently, but now has one of the lowest ratio of students per computer in OECD countries. Nevertheless, the availability of computers alone does not guarantee their effective use. Among 14 countries surveyed, an average of 63% of upper secondary students attend schools where principals reported that teachers’ lack of knowledge and skills was an obstacle to successful ICT implementation and this reached 75% or more in France and Norway.

Together, these indicators do not give a single answer to the perennial question: which education system is the best? But they do give policymakers a tool to identify areas for investment and improvement over time. Moreover, they yield ever more useful international benchmarks that help each country monitor its own progress against the performances of others, and so help to foster progress in our education systems.

Other important findings of this year's edition include:

Teacher shortage

- Among 14 OECD countries surveyed, school principals reported an average of 12% of teaching posts (full-time equivalents) in upper secondary education as vacant at the beginning of school year 2001/2002. Teacher shortage was reported most pressing in computer science, mathematics, foreign languages, science, and technology but much less so in the arts, physical education, social studies and language of instruction.
- Among the same 14 countries, an average of 14% of full-time teachers and 31% of part-time teachers were not fully meeting today's formal qualification requirements, according to school principals.
- In Belgium (Flemish Community), Denmark, Hungary, Norway and Sweden, hiring of new teachers at the upper secondary level is generally the school's responsibility whereas in Italy, Portugal and Spain, a quarter or less of upper secondary students were enrolled in schools where principals reported this as the school's responsibility.
- Teacher shortage may become more severe in the years to come when sizeable parts of the teaching force will go into retirement: In 15 out of 19 OECD countries, most primary teachers are at least 40 years old, and in Germany, Italy and Sweden, more than one third of teachers are older than 50 years. Compared with 1998, the average proportion of teachers aged 50 years or over increased on average by 1.8 percentage points in secondary education and in Finland, Germany, Ireland and the United Kingdom by more than 4 percentage points.

Student learning conditions and teachers working conditions

- The average class size in primary education is 22, but varies between countries from 36 students per class in Korea to less than half of that number in Greece, Iceland and Luxembourg.
- Students between the ages of 9 and 11 receive, on average across OECD countries, 813 hours per year of compulsory instruction time and 840 hours per year of intended instruction time in the classroom, while students between the ages of 12 and 14 receive nearly 100 hours more per year. On average among countries, reading and writing in the language of instruction, mathematics and science comprise about half of the compulsory curriculum for 9 to 11-year-olds and 41% for 12 to 14-year-olds. The degree to which schools and local and regional authorities can specify curricular content and timetables varies widely from country to country.
- The mid-career salaries of lower secondary teachers range from less than US\$ 10 000 in Hungary and the Slovak Republic to US\$ 40 000 and more in Germany, Japan, Korea, Switzerland and the United States, in purchasing power parity terms. However, teachers in secondary education tend to earn less than town planners, civil engineers and executive officials with a bachelors' or higher university level degree.
- In the five year period 1996 to 2001, teachers' salaries generally grew more slowly than GDP per capita, except in the Czech Republic, Italy, Japan, Mexico and New Zealand.
- The number of teaching hours per year in public primary schools averages 792 hours but ranges from 605 to 1 139 hours among OECD countries. The average number of teaching hours in the lower secondary education is 714 hours but ranges from 553 to 1 182 hours among OECD countries. Regulations of teachers' working time vary across countries. In most countries, teachers are formally required to work a specific number of hours; while in others only teaching time in lessons per week is specified.

Cross-border movements of students

- Between 1998 and 2001, the number of foreign students enrolled in the OECD area increased by 16%.

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- Five countries (Australia, France, Germany, the United Kingdom and the United States) receive 71% of all foreign students studying in the OECD area.
- In absolute numbers, students from Greece, Japan, Korea and Turkey represent the largest sources of intakes from OECD countries. Students from China and Southeast Asia comprise the largest numbers of foreign students from non-OECD countries.

Factors associated with student performance

- The extent to which students monitor their own learning is closely related to performance in reading literacy. Also students' beliefs that a goal is feasible, whether or not they have the necessary resources accessible to achieve it and whether they believe that it is worth expending energy to do so are strong predictors of student performance in reading literacy.
- Not surprisingly, 15-year-olds reading a diversity of print material are more proficient in reading than those reading a limited set of print material. Daily engagement in reading magazines, newspapers and comics – a kind of reading that is perhaps less valued by school than fiction books – seems, at least in some cultural contexts, to be a fruitful way of becoming a proficient reader.
- Not just student performance in reading but also engagement varies widely from country to country with Finland, at the high end, and Belgium, Germany and Spain, at the low end, the extremes. On average, girls tend to be substantially stronger engaged in reading than boys. In almost all countries, girls also express a higher self-concept than do boys in reading while the reverse is true in mathematics.
- Fifteen-year-olds whose parents have the lowest occupational status but who are highly engaged in reading achieve better reading scores than students whose parents have high or medium occupational status but who are poorly engaged in reading. All students who are highly engaged in reading achieve reading literacy scores that, on average, are significantly above the OECD mean, whatever their parents' occupational background.
- Lower expenditure on educational institutions cannot automatically be equated with a lower quality of educational services. Australia, Finland, Ireland, Korea and the United Kingdom, for example, which have moderate expenditure on education per student at primary and lower secondary levels, are among the OECD countries with the highest levels of performance by 15-year-old students in key subject areas.

The returns to educational investment

- Labour force participation rates rise with educational attainment in most OECD countries. With very few exceptions, the participation rate for graduates of tertiary education is markedly higher than that for upper secondary graduates. The gap in male participation rates is particularly wide between upper secondary graduates and those without an upper secondary qualification.
- The labour force participation rate for women with less than upper secondary attainment is particularly low. Rates for women with tertiary attainment approach or exceed 80% in all but four countries, but remain below those of men in all countries except one.
- Education and earnings are positively linked. Upper secondary and post-secondary non-tertiary education form a break point in many countries beyond which additional education attracts a particularly high premium. In all countries, graduates of tertiary-level education earn substantially more than upper secondary and post-secondary non-tertiary graduates. Earnings differentials between tertiary and upper secondary education are generally more pronounced than those between upper secondary and lower secondary or below.
- An analysis of the driving factors of economic growth shows that rising labour productivity accounted for at least half of GDP per capita growth in most OECD countries. Labour productivity can be increased in several ways and human capital plays a pivotal role in this equation, not just as an input

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linking aggregate output to the stocks of productive inputs, but also as a determinant of the rate of technological progress. The estimated long-run effect on economic output of one additional year of education in the OECD area is in the order of 6%.

References

OECD (2003), *Education at a Glance*, Paris

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Chart 1: Percentage of population aged 25-34 with tertiary education qualifications (selected countries)

Chart 2: Percentage of students attending upper secondary schools with access to computer applications* , in years shown (and number of students per computer in 2000)

*In schools where standard word processing and spreadsheet applications had been introduced as a teaching and learning tool or for planning, organising and evaluating student learning.