

Education at a Glance 2003
No wire transmission or other media use until 16 September 2003, 11:00 Paris time
OECD briefing note – United Kingdom

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New figures in this year's *Education at a Glance* give insight to changing trends in education

Many headline economic indicators fluctuate quickly enough for commentators judge the success or failure of economic policies with quarterly or annual data. In education, international comparisons of the performance of students in reading, mathematics or science can cause people to sit up but changes are often slow to achieve. This may not be surprising, given that the educational outcomes for students graduating from high school this year will have been influenced by teaching they have received since they started school around 1990, often from teachers themselves educated in the 1960s.

It is both too complacent and too pessimistic, however, to accept that change in education should take so long to achieve. Elsewhere in human endeavor, we do not expect to have to wait a generation for the replacement of a professional cohort to achieve change. What we do need is change that is guided by evidence about what is working and not by current fads.

The 2003 edition of *Education at a Glance* provides, for the first time, as strong focus on change with indicators over a decade. It confirms that things do change slowly, but it gives **indications of the direction of change and shows that the pace of progress has varied greatly across countries.**

Growing educational success pays off in increased productivity and economic growth, for the United Kingdom more so than for most other countries.

- 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 almost all OECD countries with available data (see Figure A15.2).
- Labour productivity can be increased in several ways and the educational attainment of the working population plays a pivotal role in this equation, not just as an input linking aggregate output to the stocks of productive inputs, but also as a determinant of the rate of technological progress. In the **United Kingdom**, the contribution of improvements in levels of educational attainment between 1990 and 2000 to labour productivity was much larger than in the United States and indeed in any of the other 14 OECD countries studied except Portugal (Chart A15.3).

This is also true for individuals' earnings and employment prospects.

- With very few exceptions amongst OECD countries, university-level graduates have markedly higher labour force participation rates (93% for males and 87% for females in the **United Kingdom**) than those without upper secondary qualifications (67% for males and 51% for females in the **United Kingdom**) (Table A12.1). The differentials between education levels in the **United Kingdom** are significantly larger than at the OECD average level. While there is a gender gap in labour force participation rates, it is only half as big for university-level graduates than for those with lower qualifications.
- Unemployment rates for tertiary graduates in the age group 30 to 44 years are, at 2% for males and females in the **United Kingdom**, significantly lower than for those without upper secondary

qualifications (12% for males and 8% for females) (Table A12.2). Again the educational advantage is larger in the **United Kingdom** than on average across OECD countries.

- Education and earnings are positively linked. Education beyond upper secondary brings a particularly high premium, with earnings of tertiary graduates in the age group 30 to 44 years old in the **United Kingdom** 61% higher than those with upper secondary qualifications (Table A14.1). This premium is amongst the highest in the OECD, with Czech Republic, Hungary, Portugal and the United States the only countries where it is exceeded.
- It is possible to contrast the advantages of tertiary education for individuals in terms of higher average earnings, lower risks of unemployment and the public subsidies they receive during their studies with the costs that individuals incur when studying, in terms of the tuition fees they need to pay, lost earnings during their studies or higher tax rates later in life. In all countries, this private rate of return is higher than real interest rates, and often significantly so, with the rate of return on a tertiary qualification ranging for males from around 7% in Italy and Japan to 17% in the **United Kingdom**, the highest observed value among the 10 countries for which comparable data are available (Table A14.3). The high rates of return in the **United Kingdom** are to a large extent accounted for by relatively short university studies.

The improvements in educational attainment that have driven these personal and economic benefits have been dramatic, particularly at the tertiary level.

- Earlier indicators for 1990 showed European countries tending to have a smaller percentage going on to obtain university qualifications than the United States, Canada or Australia. But this pattern is changing. The **United Kingdom** is one of a number of European countries that are now educating over a third of their young people to the university level. In fact, the **United Kingdom** is in a respectable position towards the upper end at 37% (well above the OECD average of 30%) and ranks 7th among the 17 countries with comparable data. (Table A2.1)
- Today's entry rates in universities suggest that this expansion 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 and in New Zealand, Finland, Sweden, Poland and Australia two-thirds or more are (45% for the **United Kingdom**; 41% for men, 49% for women) (Table C2.1). This is putting significant pressure on the financing of education and in eight out of 22 OECD countries, including the **United Kingdom**, 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 (Chart B1.6).

Higher tertiary participation rates are becoming visible in the qualification of the workforce.

- 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. However, the **United Kingdom** has been more successful than most in converting tertiary level expansion into higher levels of attainment in the population. Combined with low drop out rates and with one of the highest graduation rates amongst OECD countries, tertiary attainment among 25-34 year-olds has grown rapidly. Along with Australia, Belgium, Canada, France, Ireland, Korea, Norway, Spain, Sweden, the **United Kingdom** has seen double digit growth since 1991 (Table A2.4). 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. 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.

However, progress in the United Kingdom has been much more limited at the upper secondary level ...

- The proportion of individuals in the population who have not completed upper secondary education (see notes on definition) has been falling in almost all OECD countries, and rapidly in some. In the

majority of OECD countries, the ratio of upper secondary graduates to the population at the typical age of graduation now exceeds 70%, and in five countries, it exceeds 90% (Table A1.11) Ranked by upper secondary educational attainment in the population, the **United Kingdom** occupies the 13th position among 55-64-year olds in the 30 OECD countries (i.e. those who completed school some 40 years ago) but only the 22nd position among 25-34-year-olds who represent recent graduates. By contrast, Korea ranks 24th among 55-64-year-olds but 1st among 25-34-year-olds (Table A1.2).

- Also participation rates in the **United Kingdom** of 15-19-year-olds are below the OECD average. Good performance at age 15/16 as witnessed by PISA does not translate into high levels of participation post-16. After compulsory education the **United Kingdom** falls behind most other countries with 74.7% of those aged 15-19 still in education (Table C1.2). Mexico and Turkey have (much) lower rates for this age group and Italy, New Zealand, Portugal and the Slovak Republic have marginally lower rates than the United Kingdom. All other OECD countries have higher participation rates. The United Kingdom does better in the 20-29 age group, with 23.3% giving us a mid-table ranking of 15th out of 29. This position improves dramatically for those aged 30-39 with the United Kingdom 3rd behind Australia and Sweden with 13.0%. For those aged 40+, the United Kingdom score of 5.7% lifts us to 2nd behind Australia.

...and the significant minority of persons not having completed the upper secondary level faces comparatively poor employment and earnings prospects...

- The percentage of the youth population not in education or employment is slightly lower in the United Kingdom than the OECD average (Table C4.1). However, low-qualified males aged 25-29 are particularly likely to be in neither education nor work (13.9% United Kingdom: OECD 11%) (Table C4.2).
- A 30-44 year-old person in the **United Kingdom** without an upper secondary qualification gains, on average, only 68% of the earnings of an upper secondary graduate. (Table A14.1)
- The likelihood of unemployment for persons without upper secondary qualifications in the **United Kingdom** is almost twice as high as for persons with an upper secondary degree. (Table A12.3)

Accompanying these trends in participation and attainment, there have been significant increases in expenditure on education amongst OECD countries...

- 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, contributing to an average increase across these 19 countries of 16%. The increase in the **United Kingdom** was 11% (Table B2.2).
- Denmark and Sweden continue to spend the most public resources on their education systems, 6.4 and 6.3% of their GDP (Table B2.1a). In the EU area and the United States public spending amounted both to 4.8% of GDP (**United Kingdom** 4.5%) in 2000, 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 the **United Kingdom**) 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.
- **Public investment** in educational institutions has grown by 12% between 1995 and 1999 in the **United Kingdom**, the highest growth among 6 G7 countries with available data. However, considering all 25 OECD countries with available data, the figure for the **United Kingdom** remains below the OECD average growth of 16% in public investment in educational institutions (Table B2.2). Moreover, while public expenditure on education in the **United Kingdom** grew faster than total government spending, it did not grow as fast as national income. This was also the case on average across OECD countries.

...and the private share of expenditure is increasingly import.

- The share of tertiary expenditure that originates from private sources ranged, in 2000, from 3% or less in Austria, Denmark, Finland and Greece, to 78% in Korea. The **United Kingdom** is with 32% still significantly above the OECD average of 21% (note that this includes public subsidies provided to private entities such as households) (Table B3.2).
- In eight out of 20 OECD countries with comparable data, private expenditure on tertiary education grew by more than 30% between 1995 and 2000. In most countries, however, this growth in private spending was not associated with a decrease in public-sector spending on tertiary education. The **United Kingdom** was one of only a handful of countries where private expenditure on tertiary education actually fell during this period (Table B2.2).

Gender differences in educational outcomes

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 (Table A3.2).
- Furthermore, 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 (Table A11.1).

...but significant gender differences remain in study fields...

- 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. The picture in the **United Kingdom** is similar to that in most other countries (Table A3.2).

...which are already visible in students' aspirations at age 15.

- Of more concern is that gender differences in fields of study at university level are already mirrored in the educational aspirations of 15-year-olds. 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) (page 129 and www.oecd.org/edu/eag2003).

Girls are also ahead in reading performance at school.

- Results from the 2001 IEA Progress in Reading Literacy Study (PIRLS) of 4th grade students (10/11 year olds) show girls outperforming boys in every country, with the gender disparity **England** being the second highest of the 16 countries surveyed. Gender differences in **Scotland** were around the average (Table A4.1, Table A11.2).
- 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, though here the gender disparity for the **United Kingdom** was less outstanding compared with other countries than in the PIRLS study. 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 42 countries taking part

in PISA 15-year-old girls also reported higher expectation towards their future occupations than boys. (Table A11.3)

Teacher shortage

Teacher shortages may become a policy challenge for many OECD countries in the years to come, as student enrolment levels rise while older teachers retire and not enough younger people join the profession.

- In the **United Kingdom**, the proportion of older teachers (50+) is in the middle of a wide range across countries and stands at the OECD average and the proportion of teachers aged under 30 is above-average. By contrast, in Italy and Germany almost half of secondary teachers are aged over 50 and in Sweden, Iceland, the Netherlands, Norway, Finland and New Zealand still more than one third are. These countries will face particular challenges in recruiting new teachers to avoid future shortages in teaching staff.
- 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 (Table D8.3).
- A survey of upper secondary schools in 14 OECD countries showed an average of 12% of teaching posts to be vacant at the start of the 2001/2002 school year, and an average of 14% of full-time teachers and 31% of part-time teachers in these schools failed to fully comply with official training and qualification requirements. Science, technology and computer sciences, mathematics and foreign languages were cited as the areas where hiring difficulties were most acute (Table D7.1, Chart D7.1).
- In the five year period 1996 to 2001, teachers' pay rates in **England** grew more slowly than GDP per capita as was the case in most OECD countries. The reverse was, however, true in Czech Republic, Germany, Italy, Japan, Mexico and New Zealand (Table D5.4, Chart D5.2).
- The starting salaries for teachers in **England** are fairly close to the overall OECD average (slightly above for primary). Teachers in **England** with 15 years experience earn significantly above the OECD average at both primary and secondary levels, with a particularly large difference at primary level (over 20% above the OECD average). Salary rates at the top of the scale in **England** are around the OECD average at the primary level but below the average at the secondary level (Table D5.1).
- The degrees of freedom that schools have in selecting their staff varies widely: 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 (Chart D7.3).
- Across the OECD, 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 just teaching time in lessons per week is specified (Table D6.1).
- In terms of the number of hours that teachers are required to work in school each year, the **England** figure of 1265 hours is higher than the average for the 15 OECD countries reporting data whilst the figure for **Scotland** (1075 hours) is slightly below the average (Table D6.1).

Information technology in schools

One important way in which schools themselves look different today than in 1990 is the use of information and communication technology (ICT).

- During the 1990s, in the OECD countries for which data are available, the rise in the number of knowledge workers (scientists, engineers and others, such as ICT specialists and technicians who generate knowledge) accounted for nearly 30 per cent of the net employment gains recorded during this period. Wages have followed a similar pattern. For example in the **United States**, the wage of knowledge workers has risen much faster than wages of other occupations. Between 1985 and 1998, real earnings of knowledge-intensive workers grew by almost 17 per cent, cumulatively, compared with 5.3 per cent for the average employee in the **United States**. During the same period “goods-producing” occupations suffered a cut in their real earnings of nearly 2.5 per cent (Indicator A15, p. 175).
- 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 D3.2, 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 (Chart D3.2).
- 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 (Table D3.1).
- 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 (Table D3.3).

Student learning conditions

- Students between the ages of 9 and 11 receive, on average across OECD countries, 840 hours per year of intended instruction time in the classroom (890 in **England** and 1000 in **Scotland**) (Table D1.1). For OECD countries on average, students between the ages of 12 and 14 spend nearly 100 hours more per year than 9 to 11 year olds on both compulsory and intended instruction time, though in **Scotland** there is no difference.
- 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 (**Scotland** is around the OECD average though **England** is notably higher at 63%) and 41% for 12 to 14-year-olds (both **England** and **Scotland** are close to the average) (Table D1.2a). The degree to which schools and local and regional authorities can specify curricular content and timetables varies widely from country to country.
- The **United Kingdom** has comparatively large class sizes in the first years of schooling (26 students per class at the primary level in public institutions compared with an OECD average of 22, and 25 students per class at the lower secondary level compared with an OECD average of 24). Of the countries for which data are available, only Japan, Korea and Turkey have larger primary class sizes (Table D2.1).

Some factors influencing educational outcomes

The results in this year's Education at a Glance also provide insights to the factors that influence student performance.

- 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. In some countries, such as Finland and Japan, a high proportion of the students who read a variety of print content mainly read newspapers, magazines and comics. In the **United Kingdom**, as in Australia and New Zealand for example, students who read a diverse range of materials tend to choose newspapers, magazines and books (fiction and non-fiction). (Table A8.4)
- Not just student performance in reading but also engagement varies widely from country to country with Finland, at the high end, and Spain, at the low end, the extremes. The **United Kingdom** is around the average (Table A9.1).
- 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 (Table A9.2).

Notes

- Tertiary-level education - higher education. Indicators cover both the current performance of the HE system and the proportion of the adult population (25-64) who have attained HE qualifications. There are splits by gender and type of course – divided into vocational courses like HND (Type B in OECD parlance) and full-length (3yr+) theory-based degrees (“Type A”). Graduation rate is defined as the ratio of tertiary graduates to the population at typical age of graduation.
- Lower secondary education - schooling between the ages of 11 and 13.
- Upper secondary education - schooling from the age of 14, and further education.
- An “upper secondary graduate” - a person holding 5 or more GCSEs at grades A* to C, and / or an equivalent vocational qualification (NVQ level 2 or above). A person without an upper secondary qualification may be qualified, but to a lower level i.e. fewer than 5 GCSE grades A* to C or a vocational equivalent, or they may have no qualifications.
- Statutory salaries - The data on teacher pay are based on statutory pay (pay scales) in 2001 and do not attempt to capture actual average pay which will include discretionary allowances for extra duties as well as reflecting the age structure of the teacher labour force. Furthermore, the figures are for classroom teachers and so do not reflect the pay of teachers promoted to heads and deputy headships. **England** and **Scotland** have separate systems of teacher pay and so, while the publication generally refers to the United Kingdom, the teacher pay figures are shown separately for **England** and **Scotland**. The pattern of the Scottish pay comparisons closely follows that for **England** although Scottish pay levels are slightly below those in **England**).