

# Education at a Glance 2003

## Briefing notes United States

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### **New figures *Education at a Glance 2003* give insight into 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.**

### **The benefits of education**

#### *Increased levels of education pay off for countries in economic terms...*

- An analysis of the driving forces of economic growth shows that rising labor productivity (measured as GDP per person employed) accounted for at least half of GDP per capita growth in OECD countries in the 1990s. [See Chart A15.2, p. 172.] The **United States** comes 11<sup>th</sup> on this measure, with the United Kingdom, among the 26 countries compared.



- Labor productivity can be increased in several ways but the educational attainment of the working population plays a pivotal role, including as a determinant of the rate of technological progress. In the **United States**, the contribution of levels of educational attainment (human capital) to growth in labor productivity from 1990 to 2000 ranked 6<sup>th</sup> among the 15 OECD countries studied, placing it behind Portugal, the United Kingdom, Italy, France and Finland in this respect. [See Chart A15.3, p.174]

*...and for individuals in terms of earnings and employment prospects.*

- With only one exception (females in Korea), university-level-graduates (Tertiary-type A and advanced research programs) have markedly higher labor force participation rates (92 per cent for males and 81 per cent for females in the **United States**) than those without high school qualifications (75 per cent for males and 52 per cent for females in the **United States**). While there is a gender gap in labor force participation rates, it is only half as big for university-level graduates as for those with lower qualifications. The figures for the **United States** are essentially the same as the OECD average. [See Table A12.1, p. 150; Chart A12.1, p. 144.]
- Unemployment rates for tertiary graduates in the **United States** in the age group 30 to 44 years (1.8 per cent for males and 2.3 per cent for females) are significantly lower than for those without high school qualifications (7.4 per cent for males and 8.9 per cent for females). These figures in both categories are smaller than the OECD average but the gender gap in the **United States** is below the OECD average for tertiary graduates and around the OECD average for those not completing high school. [See Table A12.2, p. 151; Chart A12.2, p. 148.]
- Education and earnings are closely linked, with education beyond high school bringing a particularly high premium. Earnings of university-level graduates in the 30 to 44 years age group are more than 80 per cent higher than the earnings of those who have completed only secondary education in the Czech Republic, Hungary, Portugal, the United Kingdom and the **United States**. In the **United States**, these earnings premiums are 99 per cent for males and 89 per cent for females. [See Table A14.1, p. 165; Chart A14.1, p. 157.]
- It is possible to contrast the benefits of tertiary education for individuals in terms of higher average earnings, lower risk 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, lost earnings during their studies and higher tax rates later in life. In all countries for which the data are available, this private rate of return is higher than real interest rates, and often significantly so. The rates of return to tertiary qualifications range for males ranges from around 7 per cent in Italy and Japan to around 15 per cent or more in the **United States** and the United Kingdom. The high rates of return in the **United States** (14.9 per cent for males and 14.7 per cent for females) are to a large extent accounted for by relatively short university degree courses, compared with those of continental Europe. [Table A14.3, p. 167; Chart A14.2, p. 160.]

*Dramatic improvements in educational attainment have driven these personal and economic benefits, particularly at the tertiary level...*

- Today's entry rates in universities suggest that expansion will continue. On average across OECD countries, almost 50 per cent of the age-group now enters a tertiary program leading to the equivalent of a bachelors' degree or higher. While the **United States** was a leader in this



respect, it is now below the OECD average, with 36 per cent for men and 49 per cent for women. Other countries have moved ahead. In Australia, Finland, Hungary, Iceland, the Netherlands, New Zealand, Norway, Poland and Sweden the figures are between 54 per cent and 76 per cent. [See Table C2.1, p. 267; Chart C2.1, p. 259.] This growth is putting significant pressure on the financing of education and, in eight out of 22 OECD countries for which data are available, spending on tertiary educational institutions has not kept pace with the expansion of enrolments, with the consequence that expenditure per student has decreased, in real terms, since 1995. [See Chart B1.6, p. 193 for which data for the **United States** are not available.]

- Evidence on trends can be obtained by comparing attainment rates for different age-groups in the population. The percentages of the population across the OECD countries that have attained a university qualification (Tertiary-type A or advanced research qualification) are higher for successively younger age-groups (10 per cent for 55-64 year-olds, 14 per cent for 45-54 year-olds, 16 per cent for 35-44 year-olds and 18 per cent for 25-34 year-olds. The **United States** ranks 1<sup>st</sup> in the attainment rate among 55-64 year-olds (24 per cent) and 45-54 year-olds (30 per cent) but has achieved no increase for younger age groups. Among 25-34 year-olds, the **United States** ranks 2<sup>nd</sup> (30 per cent) behind Norway (35 per cent) and other countries with lower levels have narrowed the gap. The Republic of South Korea, for example, is equal 17<sup>th</sup> for 55-64 year-olds (8 per cent) but equal 3<sup>rd</sup> with Canada (25 per cent) among 25-34 year-olds. [See Table A2.3, p. 53, Chart A2.3, p. 46.]
- Commencing is only part of the story. Surviving is the other since graduation is the typical objective. The **United States** has a relatively high drop-out rate from first degree programs (44 per cent). The OECD average is 30 per cent. Countries with much lower rates include Japan (6 per cent), Ireland (15 per cent) and the United Kingdom (17 per cent). [See Table A2.2, p. 52; Chart A2.5, p. 48.]
- Earlier indicators for 1990 showed European countries tending to have a smaller percentage of their populations going on to obtain university qualifications than the United States, Canada or Australia, but this pattern is changing. Six European countries are now educating over a third of their young people to university level. [See Table A2.1, p. 51, Chart A2.1, p. 43, for which data are not available for the **United States**.]

*...while, at the high-school level, progress has been more mixed.*

- The proportions of individuals in the population who have completed high school have been rising in almost all OECD countries, as shown by the rates for successively younger groups in the populations. In the **United States**, progress here has been limited, with many countries now outperforming it. The **United States** ranks 1<sup>st</sup> among the 30 OECD countries in the completion rates for 55-64 year-olds and 45-54 year-olds but 6<sup>th</sup> for 35-44-year-olds and 9<sup>th</sup> position for 25-34-year-olds. By contrast, Korea ranks 24<sup>th</sup> for 55-64-year-olds but 1<sup>st</sup> for 25-34-year-olds. The rates have not declined in the **United States**. They have simply risen faster in other countries. [See Table A1.2, p. 41; Chart A1.2, p. 37.]

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

- Increased participation in higher levels of initial education changes the education level of the workforce only gradually. For example, an increase in the graduation rate among young people



10 years ago will have affected about a quarter of people presently of working age. More rapid increase can be achieved through immigrations or through enrolment of adults in tertiary education. In Australia, Denmark, Finland, Iceland, Switzerland and the **United States**, the oldest 20 per cent of new university-level students are 27 or more years of age (28.3 years for the **United States**). [See Table C2.1, p. 267.]

- In tertiary attainment among 25-34 year-olds, there was double-digit growth between 1991 and 2001 in Australia, Belgium, Canada, France, Ireland, Korea, Norway, Spain, Sweden and the United Kingdom. Tertiary attainment grew in the **United States**, from 30 per cent to 39 per cent in this period. Only four countries have a higher level of tertiary attainment than the **United States**: Ireland, which started behind in 1991 at 20 per cent and reached 51 per cent in 2001, Canada, which started marginally ahead in 1991 at 32 per cent and reached to 51 per cent in 2001, and Korea at 40 per cent and Japan at 48 per cent in 2001, for both of which 1991 data are not available. Germany, by contrast, started the 1990s with 19 per cent and had reached only 22 per cent by 2001. (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.) [See Table A2.4, p. 54.]

*...leaving the significant minority not completing high school with comparatively poor employment and earnings prospects.*

- The likelihood of unemployment for persons without a high school degree in the **United States** (7.5 per cent for males and 8.9 per cent for females) is about twice as high as for persons who have completed high school (4.2 per cent for males and 3.4 per cent for females) and about four times as high as for those with a university degree (1.9 per cent for males and 2.0 per cent for females). [See Table A12.2, p. 151.]
- In the **United States**, the earnings of those who have not completed high school are, on average, only 70 per cent of the earning of those who have. [See Table A14.1, p. 165, Chart A14.1, p. 157.]

## **Investment in education**

*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 per cent in real terms, contributing to an average increase across these 19 countries of 16 per cent. [See Table B2.2, p. 210, in which the trend information for the **United States** is not available since the data for 1995 are not available.]
- Denmark and Sweden continue to spend the most public resources on their education systems (6.4 and 6.3 per cent of GDP respectively. In both the EU area overall and in the **United States**, public spending amounted to 4.8 per cent of GDP in 2000, but large private spending (1.8 per cent for tertiary education and 0.4 per cent for primary and secondary education) pushed total spending on educational institutions in the United States to 7.0% (compared with 5.3% in the EU area). The figure for the **United States** essentially matches that of the highest spending



country Korea (7.1 per cent of GDP of which 4.3 per cent is public and 2.8 per cent is private). Japan remains a modest spender (4.6%), even when above-average private spending (1.2%) is taken into account. [See Table B2.1a, p. 207.]

- While the **United States** does not commit the highest percentage of GDP to expenditure on education, it does achieve the highest expenditure per student from primary to tertiary education (in equivalent US dollars converted using purchasing power parities) at US\$ 10 240. The levels in other countries range from less than US\$ 3 000 in the Czech Republic, Hungary, Mexico, Poland, the Slovak Republic and Turkey to more than US\$ 8 000 per student in Austria, Denmark, Norway and Switzerland. [See Table B1.1, p. 197, Chart B1.1, p. 183.]
- The **United States** is one of eight countries spending twice as much or more per student at the tertiary level than the secondary level (US\$ 20 358 per tertiary student and US\$ 8 855 per secondary student in the **United States**). The multiple for the **United States** is 2.3. It is highest for Hungary and Mexico at 2.9 and lowest for Portugal and Greece at 0.9. [See Table B1.1, p. 197.]

*...with the private share of expenditure increasingly important, particularly at the tertiary level.*

- The share of expenditure on primary, secondary and post-secondary, non-tertiary education that originates from private sources ranged, in 2000, from essentially zero in Finland, Norway, Portugal and Sweden to almost 20 per cent in Germany and Korea. The **United States**, at 10 per cent, is above the OECD average and behind only six countries. (Note that this includes public subsidies provided to private entities such as households.) [See Table B3.2, p. 220.]
- The share of tertiary expenditure that originates from private sources ranged, in 2000, from 3 per cent or less in Austria, Denmark, Finland and Greece, to 78 per cent in Korea. The **United States**, with 66.1 per cent is 2<sup>nd</sup> after Korea and well above the OECD average of 21.4 per cent. (Again, note that this includes public subsidies provided to private entities such as households.) [See Table B3.2, p. 220.]
- In eight out of 20 OECD countries with comparable data, private expenditure on tertiary education grew by more than 30 per cent 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. [See Table B2.2, p. 220.]

*Public funding of education is a social priority, even in OECD countries with little public involvement in other areas.*

- Across OECD countries, when the size of public budgets relative to GDP is compared with the proportion of public spending that is committed to education, it is evident that even in countries with relatively low rates of public spending, the priority that education is awarded within that spending is very high. For instance, the share of public spending that goes to education in Mexico (23.6 per cent), Korea (17.6 per cent) and the **United States** (15.5 per cent) is amongst the highest of OECD countries, yet total public spending accounts for a relatively low proportion of GDP in these countries. [See Table B4.1, p. 227.]



*The mix of public and private funding for schools is managed differently in different countries.*

- In the **United States**, students are either enrolled in schools that are publicly financed and managed (88.4 per cent at the primary level, 90.1 per cent at the middle school level and 90.6 per cent at the high school level) or privately managed and predominantly privately financed (11.6 per cent at the primary level, 9.9 per cent at the middle school level and 9.4 per cent at the high school level). At the primary level, no other country has such a high percentage of students enrolled in privately-managed and privately-financed schools and at the middle school level only Mexico and Portugal show similar levels. Some other countries have substantial enrolments in schools that are privately managed but fully or partly government funded, for example at the primary level, the Netherlands (68.4 per cent), Belgium (54.4 per cent), Spain 30.2 per cent and Australia (27.6 per cent). In the Netherlands, these private schools are fully funded by government at the same level as public schools. In Australia, they are funded to varying extents, depending on ‘need’, but they all raise some of their funding through fees, many achieving substantially higher levels of funding per student through this mix than public schools receive. [See Table C2.4, p. 270.]

**Gender differences in educational outcomes**

*In the 1990s women moved ahead of men in 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. [See Table A3.2, p. 61.]. 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.

*...with higher expectations for the future, but gender differences in study fields...*

- In 40 out of the 42 countries taking part in OECD’s Programme for International Student Assessment (PISA) – the **United States** one of them – 15-year-old females reported higher expectations for their future occupations than males. [See Table A11.1, p. 139.]
- Nevertheless, there remain gender discrepancies in educational and career choices with young men still favoring 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. These gender differences are smaller in the **United States** than in other countries, except for some countries with low overall participation rates in higher education enrolments. [See Table A3.2, p. 61.]

*...that have consequences for individual careers and salaries.*

- 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).

- The benefit for women (in terms of the earnings premium for female tertiary graduates over females who have completed only upper secondary education) is greater than the benefit for men (in terms of the earnings premium for male tertiary graduates over males who have completed only upper secondary education) in 9 of the 20 countries for which data are available. The relative benefit for women is greatest in the United Kingdom where the premium for men is 47 per cent and for women 83 per cent and next greatest in Switzerland (41 per cent for men and 54 per cent for women). The relative benefit for women is least in Hungary (152 per cent for men and 79 per cent for women). In the **United States**, there is a relative benefit for men (earnings premium of 93 per cent for men compared with a premium of 76 per cent for women). Taking only 20-44 year-olds, instead of 25-64 year-olds, the gap is a little smaller in the **United States** (90 per cent for men compared with 80 per cent for women). Note that these figures do not compare earnings of men and women. They compare the differences in earnings of female college graduates and non-graduates with the differences in earnings of male college graduates and non-graduates. [Table A14.1, p. 165]
- These career choices emerge early. Gender differences in fields of study at university level are mirrored in the educational aspirations of 15-year-olds. In responses in PISA, career expectations of boys were far more often associated with physics, mathematics or engineering (on average 18 per cent of boys versus 5 per cent of girls) while those of girls were more frequently related to life sciences and health (20 per cent of girls compared to only 7 per cent of boys). [See p. 129 and <http://www.oecd.org/edu/eag2003>.]

***There are also marked gender differences in educational achievement.***

- At the elementary school level, girls outperformed boys in reading in every country in the International Association for the Evaluation of Educational Achievement’s (IEA) Progress in Reading Literacy Study (PIRLS), which provides a profile of students’ performances in reading at the 4<sup>th</sup> grade level. The gender disparity for the **United States** was close to the average. [See Table A11.2, p. 138.]
- Females were also better readers by age 15 in every one of the 43 countries taking part in OECD’s PISA. In about half of the countries, males remained ahead in mathematical literacy though the differences were much smaller. In scientific literacy, there were few significant differences. Among 15-year-olds in the **United States**, females were significantly better than males in reading, marginally but not significantly worse in mathematical literacy and marginally but not significantly better in scientific literacy. [See Table A11.3, p. 139.]



## Teacher shortage

### *Teacher shortages are becoming a policy challenge for many OECD countries...*

- Some countries are already facing difficulties in recruiting new teachers while, at the same time, facing impending retirement of large numbers of teachers from an aging profession. In Italy and Germany almost half of secondary teachers are aged over 50 and in Sweden, Iceland, the Netherlands, Norway, Finland and New Zealand more than one third are. [See Table D8.1, p. 408, Table D8.3, p. 410, for neither of which are data on the **United States** available.]
- A survey of upper secondary schools in 14 OECD countries showed an average of 12 per cent of teaching posts to be vacant at the start of the 2001-02 school year, and an average of 14 per cent of full-time teachers and 31 per cent 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. [See Table D7.1, p. 401, Chart D7.1, p. 391 based on the OECD International Survey of Upper Secondary Schools (ISUSS) in which the **United States** did not participate.]

### *...with salaries being one factor that could influence recruitment ...*

- Starting salaries for primary teachers in the **United States** are lower than those in Australia, Denmark, Germany, Norway and Switzerland – Germany, the highest, being 34 per cent higher at US\$ 38 412 than the **United States**. Salaries at the top of the scale accessible with minimum training in the **United States** are lower than those in Japan, Korea and Switzerland – Korea, the highest, being 35 per cent higher at US\$ 68 581 than the **United States**. [See Table D5.1, p. 378.]
- Salaries do not increase much during a teacher's career. In the **United States**, the salary after 15 years' experience is only 1.45 times the starting salary. This is marginally above the OECD average but in no country is the multiple greater than 2.00 (1.93 in New Zealand and 1.89 in Japan being the highest). [See Table D5.1, p. 379.]

### *...and working conditions another.*

- Across the OECD, the number of teaching hours per year in public primary schools averages 792 but ranges from 605 to 1 139. The average number of teaching hours in the lower secondary education is 714 but ranges from 553 to 1 182. Teachers in the **United States** are at the top of the list in primary schools (1 139 hours), second in lower secondary school (1 127 hours) behind Mexico, and at the top in upper secondary schools (1 121 hours). [See Table D6.1, p. 389.]
- In most countries, teachers are formally required to work a specified number of hours, including both teaching time and non-teaching time. In some, the working time required at school is considerably greater than that required for teaching, for example 1 746 hours compared with 605 hours for primary teachers in Greece. For primary teachers in the **United States**, the difference is relatively small, with working time in schools at 1 353 hours and teaching time at 1 139 hours. [See Table D6.1, p. 389.]
- Class size is frequently seen as a key working condition, often being the subject of negotiations with employing authorities. Average class sizes vary substantially across OECD countries, from



36.3 in Korea to 15.8 in Luxembourg. [See Table D2.1, p. 329 for which data are not available for the **United States**.] Korea and Japan, which also has relatively large class sizes, are high performing countries in international comparisons of student achievement. This and other evidence points to there being no simple relationship between class size and learning benefits for students, though there may be a benefit in working conditions for teachers.

### **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. [See Chart A8.2, p. 102.] The **United States** ranks 6<sup>th</sup> among the OECD countries in the percentage of 15-year-old males and females who read a diversity of print material. [See Table A8.4.]
- Not only student performance in reading but also engagement varies widely across countries, in this case from Finland at the high end to Belgium at the low end, with the **United States** ranked 21<sup>st</sup> among 27 OECD countries. [See Table A9.1, p. 112.]
- 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. [See Table A9.2, p. 112.]

### **Notes**

- Tertiary-level education - higher education. Indicators cover both the current performance of the higher education system and the proportion of the adult population (25-64) who have attained higher education qualifications. There are splits by gender and type of course – divided into vocational courses like those in community colleges (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 – secondary schooling from the age of 14
- 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 positions such as principal, deputy principal, head of department, and so on.