

EDUCATION AS THE KEY TO LONG-TERM RECOVERY

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Summary

This year's edition of *Education at a Glance* (OECD 2009) is published at a time when all eyes are focused on addressing the financial crisis and its economic and social fallout. Presenting data up to 2007, the volume cannot yet assess the impact of the crisis on education systems, but its indicators provide important insights about how investments in human capital can contribute to the recovery. The report suggests that there is an urgent need in many OECD countries to review how the economic and social benefits and costs of higher education are shared between individuals and society. For example, the report found that countries in which students pay tuition fees for tertiary institutions do not show lower levels of access to university-level education than the OECD average. At the same time, there is no evidence that the promotion of 'free education for all' would contribute to more social mobility or less economic inequality.

Better qualifications or lower pay – a large and growing skills gap.

Education has always been a critical investment for the future, for individuals, for economies and for societies at large. The gross earnings premium for males from tertiary education over the working life averages USD 186 000 across OECD countries and exceeds USD 300 000 in Italy and the United States. When factoring in the direct and indirect costs for education, the net public return from an investment in tertiary education averages USD 52 000 on average for a male student. This is almost twice the amount of the investment made by the public side (including both public direct costs and public forgone revenue), and as such, provides a strong incentive to expand higher education in most countries through either public or private financing. Furthermore, among the 30 OECD countries with the largest expansion of college education over the last decades, most still see rising earnings differentials for college graduates, suggesting that the increase in advanced qualifications has not necessarily led to a decrease in their pay as has been the case in many countries for individuals with less than upper secondary education.

The incentives for individuals to stay on in education are likely to rise over the next years given the economic environment: For instance, because the opportunity costs for

education decline as the difficulties of finding employment increase and opportunity costs or lost earnings while studying tend to be the largest of all cost components for students (except in the United States where tuition fees are highest) job prospects have a real influence on young individuals' decision to continue their education.

Earnings foregone depend, of course, on the wage levels one can expect to receive and most notably the probability to find a job. At a time where the labour market for young adults is likely to deteriorate in the coming years, forgone earnings and thus total costs will fall and thereby also increase the returns for tertiary education. The incentives to invest in education both from the private and public perspective will thus be further advanced across most OECD countries.

The volume of educational activity has been expanding rapidly over the past decade.

The share of people participating in education beyond compulsory schooling has grown from a small minority to the vast majority. This expansion continues, as near-universal participation at upper-secondary level is followed by ever-wider enrolment in tertiary-level institutions. The number of individuals that have attained tertiary education has increased, on average, by 4.5% each year since 1998, and by 7% per year or more in Ireland, Poland, Portugal, Spain, and Turkey. In 2007, one-third of the youth cohort (25-34 year-olds) had attained a tertiary level qualification and in some countries (Canada, Japan, Korea and the partner country the Russian Federation), over 50% of the youth cohort have. This implies that overall tertiary attainment levels will continue to rise in the coming years. In France, Ireland, Japan and Korea, there is a difference of 25 percentage points or more in the tertiary attainment of the oldest and youngest age cohorts.

Increases in tertiary graduation rates have been particularly marked over the last decade. On average across OECD countries with available data, university-level graduation rates have virtually doubled from 20% in 1995 to 39% in 2007. As the pace of change has differed widely across countries, the relative standing of countries on this measure has changed dramatically since 1995. At one end of the spectrum, Finland improved its relative performance

from Rank 10 in 1995 to Rank 3 in 2007. Conversely, the United States dropped from Rank 2 in 1995 to Rank 14 in 2007.

The other good news is that, with the exception of Germany, Japan, Mexico, Poland, Turkey and the United States, the number of individuals available to the labour market with below secondary education, that is the share of the most poorly qualified, decreased between 1998 and 2006, in some countries by very small amounts but in others substantially so. While the labour-market prospects for these individuals remain poor and deteriorating, at least their numbers have declined.

Tertiary educated young individuals in the Czech Republic, Hungary, Iceland, Luxembourg, the Netherlands, and the Slovak Republic and in the partner country Slovenia continue to have good prospects of finding a skilled job. In these countries, 85% or more of tertiary educated 25-34 year-olds are employed in skilled occupations, indicating that those with higher education are in strong demand. Since 1998, young tertiary educated individuals in Austria, Finland, Germany and Switzerland have improved their prospects of finding a skilled job. At the same time, young workers without a tertiary education appear to have a good chance relative to older workers in finding a skilled job, indicating a potential gap between supply and demand of high-end skills in these countries.

In countries without significant household spending on tertiary education, declining opportunity costs can strengthen the case for more household investments because, as the more educated individuals have a stronger attachment to the labour market, this increases the benefits of education. Conversely, in countries where significant house spending may be a barrier for increasing student participation, additional public spending may leverage additional participants and thus additional public benefits. Last but not least, graduating and entering the labour market in an economic downturn can be expected to become more difficult, as employers cut jobs and young graduates compete with more experienced workers.

Early childhood education has been another area where significant progress has been achieved.

The expansion of education systems has been very dynamic also in early childhood education. While in 1996 there were, on average across OECD countries, 41% of children four years and younger as a percentage of 3 to 4 year-olds enrolled in educational institutions, in 2007 it was 71%. In fact, in Austria, Denmark, Spain, Norway, Korea, Portugal, Germany, Switzerland, Finland, Sweden, Poland and Mexico this proportion more than doubled over this period. In Sweden, for example, enrolment in

early childhood education stood at 40% in 1996 while in 2007 it was, at 98%, virtually universal. In contrast, in New Zealand, Greece, Iceland, Ireland, Australia, France, the United States and the Netherlands the growth rates remained below 50%, although in New Zealand, Iceland and France this is mainly explained with enrolment being close to universal already in 1998. In half the OECD countries, enrolment in early childhood education is now 80% or higher.

Important equity-related considerations which arise from the deteriorating job prospects for the less-well qualified.

While enrolments for 15-19 year-olds have been steadily rising in most countries, this still leaves an important minority who leave education without acquiring a baseline qualification. Across OECD countries, 42% with less than an upper secondary qualification are not even employed. Even those with higher levels of education are vulnerable if they become unemployed. Young people with lower qualifications who become unemployed are also more likely to spend a long time out of work: in most countries over half of low-qualified unemployed 25-34 year-olds are long-term unemployed. In contrast, as noted before, those in work enjoy high wage premiums for completing tertiary education – over 50% in most countries.

Opportunities for continuing education and training are often designed to make up for deficiencies in initial education, but the data suggest that participation among individuals with strong initial qualifications is significantly higher than among the least qualified, such that these opportunities often do not reach those who need them most.

Moreover if the demand for education and qualifications continues to rise as labour market prospects weaken, the gaps in educational attainment between the younger and older adult cohorts are likely to widen further. The vulnerability of older, often less qualified, adults to chronic long-term economic inactivity may thus become more acute. In contrast with much higher levels of educational participation among those in their twenties, less than 6% (5.9%) of the 30-39 year-old population across OECD countries are enrolled full- or part-time. While in some countries it is significantly higher than this, at more than 1 in 10 (Australia, Finland, Iceland, New Zealand and Sweden), in others participation is less than 3% of 30-39 year-olds (France, Germany, Korea, Luxembourg, the Netherlands, and Turkey and partner country the Russian Federation), with even lower levels for over 40s in Austria, the Czech Republic, France, Germany, Hungary, Ireland, Italy, Korea, Luxembourg, Mexico, the Netherlands, Portugal, the Slovak Republic, Switzerland, Turkey and the partner coun-

tries Chile, the Russian Federation and Slovenia. With lifelong learning more essential than ever, public policy needs to ask how adequately education and training systems are addressing the learning needs of older adults who are in need of new skills.

As far-reaching as the labour market impacts of the crisis are, the potential social consequences may last even longer.

The data on the economic outcomes of education are this year complemented by a new indicator on social outcome. The focus is on three aspects that reflect the health and cohesiveness of society: self-assessed health, political interest and interpersonal trust. All of these social outcomes have a positive relationship to educational attainment, but they differ in terms of which level appears to confer the greatest advantage. Students who complete upper secondary education are much more likely to report good health than those who do not. Increase in political interest and the belief that most people try to be fair are in contrast more related to the attainment of a tertiary level of education.

For self-reported health, an increase in educational attainment from below-upper secondary to upper secondary level is associated with a stronger and more consistent increase in health outcomes, compared to an increase in educational attainment from upper secondary to tertiary level, in all surveyed countries except Poland. For political interest and interpersonal trust, an increase in educational attainment from upper secondary to tertiary level is broadly associated with stronger and more consistent increases in social outcomes, compared to an increase in educational attainment at the lower level.

The association between educational attainment and social outcomes generally weakens after controlling for household income, suggesting that income is one pathway to explaining this relationship. However, in most countries, the association between education and social outcomes remains strong after adjusting for household income. Hence, what individuals potentially acquire through education – e.g. competencies and psycho-social features such as attitudes and resilience – may have an important role in raising social outcomes, independent of education's effect on income.

Opportunities for work-based vocational education and training is at risk

At a time when it is so important to invest in knowledge, skills and capacities that are relevant to economies and societies, particular pressures will be faced in those systems which rely on a major component of work-based

training as part of vocational education and training at the secondary or tertiary levels. Companies struggling to cut costs and avoid lay-offs may well find it increasingly hard to place trainees. Systems are not in the same position in this regard: in many, only a small number of months are spent by 15-29 year-olds on average in both education and employment combined. But in some, to be "in education" means to be simultaneously "in employment" for many young people, including on work study programmes. In Denmark, Germany, Hungary, Ireland, Switzerland and the partner country Estonia, around 75% of upper secondary students are in vocational programmes which combine school- and workbased elements. In Australia, Denmark, Iceland (in the case of women only), the Netherlands, Switzerland and the United Kingdom (women only), more than half of the time in education between ages 15 and 29 will have the double status combining it with employment.

Public and household spending on education is being scrutinised.

OECD countries as a whole spend 6.1% of their collective GDP on education, all levels combined. In Denmark, Iceland, Korea, the United States and the partner country Israel, it is over 7%. As a share of total public expenditure, the 2006 OECD average for education stood at 13.3%, ranging from less than 10% in Germany, Italy and Japan to the far higher figure of 22% in Mexico.

Expressed on a per-student basis OECD countries spend, on average, USD 93 775 per student over the duration of primary and secondary studies, ranging from less than USD 40 000 in Mexico and the Slovak Republic, and the partner countries Brazil, Chile and the Russian Federation, to USD 100 000 or more in Austria, Denmark, Iceland, Ireland, Italy, Luxembourg, Norway, Switzerland, the United Kingdom and the United States (all figures are corrected for cross-country differences in purchasing power).

It is noteworthy that expenditure per student on primary and secondary schools increased in every country, on average, by 35% between 1995 and 2006, a period of relatively stable student numbers. The pattern is different at the tertiary level where spending per student has fallen in one third of OECD and partner countries; expenditure has not kept up with the expansion in student numbers.

At the tertiary level, expenditure on educational institutions per student increased by 11 percentage points between 2000 and 2006 on average in OECD countries after having remained stable between 1995 and 2000. This shows governments' efforts to deal with the expansion of tertiary education through massive investment. Five out of the 11 countries (the Czech Republic, Mexico, Poland, the

Slovak Republic and Switzerland) in which student enrolments in tertiary education increased by more than 20 percentage points between 2000 and 2006 increased their expenditure on tertiary educational institutions by at least the same proportion over the period, whereas Hungary, Iceland, Ireland and the partner countries Brazil, Chile and Israel did not.

Countries vary not just in how much they spend on education, but also in how they spend their money.

The case for education's role in the recovery will require a demonstration that education is capable of transforming itself to improve outcomes and value for money. It is difficult to establish the right combination of well-trained and talented personnel, appropriate instructional time and material, and adequate facilities. However, the new indicators shed some light on this by examining the choices countries make when investing their resources in primary and secondary education, such as trade-offs between the hours that students spend in the classroom, the number of teaching hours of teachers, class sizes (proxy measure), teachers' salaries and the proportion of teacher's working time that is devoted to teaching.

First of all, salary cost per student at upper secondary level varies significantly between countries, from 3.6% of GDP per capita in the Slovak Republic (less than half of the OECD average rate of 11.4%) to over six times that rate in Portugal (22%, nearly twice the OECD average). Four factors influence these differences – salary level, instruction time for students, teaching time of teachers and average class size – so that a given level of salary cost per student can result from many different combinations of the four factors. As a result, similar levels of expenditure among countries in primary and secondary education can mask a variety of contrasting policy choices. For example, in Korea and Luxembourg salary costs per student as a percentage of GDP per capita is both around 15% at the upper secondary level. However, while Korea uses very large class sizes to pay high teacher salaries, finance above-average instruction time for students and provide teachers with time for other things than teaching, Luxembourg has invested most of its resources into small class sizes, at the expense of below-average instruction time and salaries.

Effective cost-sharing between participants in the education system and society as a whole

Cost-sharing is especially relevant for pre-primary and tertiary education, for which full or nearly full public funding is less common. As new client groups participate in a wider range of educational programmes and choose

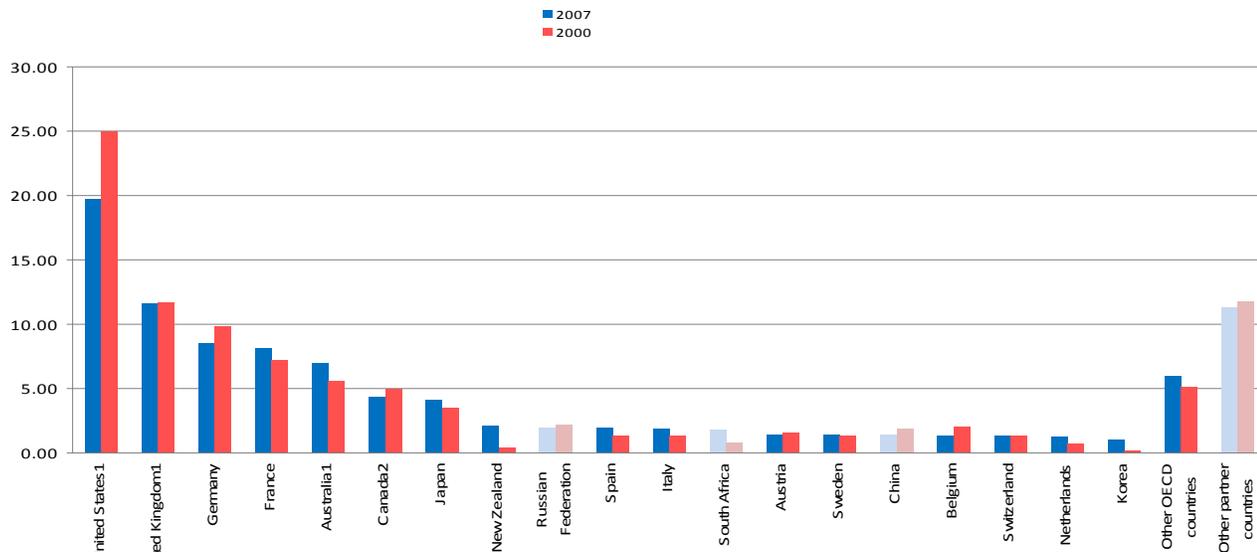
among more opportunities from increasing numbers of providers, governments are forging new partnerships to mobilise the necessary resources for education and to share costs and benefits more equitably. As a result, public funding more often provides only a part (albeit a very large part) of investment in education, and the role of private sources, mainly through households, has become more important. Some stakeholders are concerned that this balance should not become so tilted as to discourage potential students to access to tertiary education. Thus, changes in a country's public/private funding shares can provide important information on changing patterns and levels of participation within its educational system. Indicator B3 shows that while in all countries for which comparable data are available public funding on educational institutions increased between 2000 and 2006, household spending increased at an even greater rate in nearly three-quarters of these countries, even if in 2006, 85% of expenditure, on average, for all levels of education combined, was still from public sources.

On average among the 18 OECD countries for which trend data are available, the share of public funding in tertiary institutions decreased slightly from 78% in 1995 to 76% in 2000 and to 72% in 2005 and 2006. This trend is mainly influenced by non-European countries in which tuition fees are generally higher and enterprises participate more actively by providing grants to finance tertiary institutions. However, the increase in household spending has gone hand in hand with increased public financing. Compared to other levels of education, tertiary institutions and to a lesser extent pre-primary institutions obtain the largest proportions of funds from private sources, at 27% and 19%, respectively.

...and one where countries differ in their approaches particularly when it comes to tuition

In the context of the debate of how the benefits and costs of education should be shared, decisions taken by policy makers on the tuition fees charged by educational institutions affect both the cost of tertiary studies to students and the resources available to tertiary institutions. It is noteworthy that OECD countries in which students are required to pay tuition fees and can benefit from particularly large public subsidies do not show lower levels of access to university-level education than the OECD average. For example, Australia (86%) and New Zealand (76%) have among the highest entry rates to university-level education, and the Netherlands (60%) and the United States (65%) are above the OECD average. The higher entry rates to university-level education in Australia and New Zealand are, however, also due to high proportion of international students. These two countries substantially increased their share in the international education market (see Figure 1). There are large differ-

Chart C2.3. Trends in international education market shares (2000, 2007)
Percentage of all foreign tertiary students enrolled, by destination



1. Data relate to international students defined on the basis of their country of residence.

2. Year of reference 2006.

Countries are ranked in descending order of 2007 market shares.

Source: OECD and UNESCO Institute for Statistics for most data on partner countries. Table C2.7, available online. See Annex 3 for notes (www.oecd.org/edu/eag2009).

ences among OECD and partner countries for which data are available in the average tuition fees charged by university-level public institutions. In eight OECD countries public institutions charge no tuition fees, but in one-third of countries with available data public institutions charge annual tuition fees for national students in excess of USD 1 500. Among the EU19 countries for which data are available, only Italy, the Netherlands, Portugal and the United Kingdom (government-dependent institutions) have annual tuition fees that represent more than USD1 100 per full-time student.

Concluding remarks

Governments are paying increasing attention to international educational comparisons as they search for effective policies that enhance individuals' social and economic prospects, provide incentives for greater efficiency in the provision of education, and help to mobilise resources to meet rising demands.

The general trend towards freely circulating capital, goods and services, coupled with changes in the openness of labour markets, has translated into growing demands for an international dimension of education and training. Indeed, as world economies become increasingly inter-connected, international skills have grown in importance for operating on a global scale. Globally oriented firms seek internationally-competent workers versed in foreign languages and having mastered basic inter-cultural skills to successfully interact with international partners. Governments as well as individuals are looking to higher education to play a role in broadening students' horizons and allowing them to develop a

deeper understanding of the world's languages, cultures and business methods. From a macroeconomic perspective, international negotiations on the liberalisation of trade in services highlight the trade implications of the internationalisation of education services. Some OECD countries already show signs of specialisation in education exports. The long-term trend towards a greater internationalisation of education is likely to have a growing impact on countries' balance of payments as a result of revenue from tuition fees and domestic consumption by international students..

The internationalisation of tertiary education has many economic impacts, in addition to the short-term monetary costs and benefits that are reflected in current account balances. It can provide an opportunity for smaller and/or less-developed educational systems to improve the cost efficiency of their education provision. Indeed, training opportunities abroad may constitute a cost-efficient alternative to national provision and allow countries to focus limited resources on educational programmes for which economies of scale can be generated, or to expand participation in tertiary education in spite of bottlenecks in provision.

Acknowledgement

Based on the OECD (2009) Education at a Glance 2009. Paris (see www.oecd.org/edu/eag2009)

SCIENCE IN THE NEWS

CELLPHONES TEAM UP TO MAKE WI-FI WHERE YOU WANT IT

Microsoft has built a system that knits together the internet connections of a collection of smartphones to create a high-speed wireless hotspot that computers can use when other connections aren't available.

The computers connect to the phones using short-range Wi-Fi, requesting web pages as if they were using a wireless router with a wired connection to the internet, and the cellphones use their long-range cellular connection to get the files requested from the net.

Crucially, the system, dubbed [Cool-Tether](#), coordinates the phones to send data in fewer, longer bursts, and to make sure that each "energy tail" is associated with as much data transfer as possible. Cool-Tether uses a quarter as much energy as the previous version of the system, with little loss of downloading speed.

[Srinivasan Keshav](#) of the University of Waterloo in Ontario, Canada, says Cool-Tether incorporates "some neat ideas, [including] burst transmission and a careful analysis of energy". However, it's not clear how practical it is today, he argues, because Wi-Fi-enabled cellphones are not yet that common.

For details see: [New Scientist](#).

AFRICAN INITIATIVE TRAINS STUDENTS, EXPLORES GEOPHYSICAL MYSTERIES

Earthquakes, volcanoes and the African superplume are only some of the phenomena under investigation through AfricaArray, a program that establishes geophysical observatories, trains African and American students and examines geophysical phenomena on the African continent.

The model, created by a trio of institutions – Penn State; University of the Witwatersrand, Johannesburg, S.A., and the Council for Geoscience (S.A.) – combines student education with establishment of a research program in geophysics; field schools attended by African and American students and corporate personnel, and a graduate exchange program.

The center of the program is the research that relies on data from a network of seismic observatories: 27 installed by AfricaArray, 6 that should be installed by the end of the year and 16 other seismic observatories. The program also employs temporary targeted networks of stations for specific, higher resolution problems and cur-

rently has networks in Angola, Botswana and Namibia exploring the Congo Craton; South African gold mines looking at small, deep seismic events, and in Uganda/Tanzania for imaging the African Superplume. Data from the stations is stored with the Incorporated Research Institutions for Seismology (IRIS), a university research consortium sponsored by the National Science Foundation.

So far, after three years, AfricaArray has supported 34 undergraduate, 13 masters and 10 doctoral students. They have also hosted five postdoctoral fellows. From the U.S. side, 12 students, half of them women, have participated in three-week geophysical summer programs to South Africa from North Carolina A&T State University; Fort Valley State University, Georgia; University of Texas, El Paso, and California State University, Northridge. Graduate students from Wits have also come to the U.S. to study under Penn State faculty co-advisors.

Plans for the future include expansion of seismic observatories into West Africa and eventually North Africa as well. They are currently working with two other African universities – Agostinho Neto in Angola and Addis Ababa University in Ethiopia – to include the program in their universities. The researchers would like to see installation of additional types of sensors and monitors including meteorological, environmental and geographic positioning system instruments, noting that once the infrastructure is there for the seismic observations, it is easier to collect data in other disciplines.

Map of Africa showing permanent seismic observatories associated with AfricaArray.

