6

Outcomes, Benefits and Returns

Very rich information on educational outcomes has been generated through OECD work, especially with the triennial Programme for International Student Assessment (PISA), which surveys the achievements of 15-year-olds in reading, mathematics, science and related aspects of competence, together with a range of associated background information. Education is also closely related to employment outcomes and earnings, with key OECD findings reported in this chapter. Additionally there is an expanding analysis of returns to education within the OECD, with findings confirming the positive returns to higher levels of educational attainment on a variety of measures, certainly for the individual, but also for the economy at large. There are also positive returns to early childhood education and care, and to vocational education. Work on the social outcomes of education examines how education influences health, civic participation and social engagement, as well as the economic outcomes.

INTRODUCTION

Very rich information on educational outcomes has been generated through OECD work, especially with the triennial Programme for International Student Assessment (PISA) surveys. These survey the achievement of 15-year-olds in different competence areas, together with a growing range of associated background information, and in many non-member countries and economies, as well as those of the OECD. In charting patterns, large numbers do not attain levels that might be regarded as the minimum for 21st century knowledge economies. There is also expanding analysis of returns to education within the OECD. Findings confirm the positive returns to higher levels of educational attainment on a variety of measures, certainly for the individual, but also for the economy at large. Education affects employment and earnings, but it also has an impact on an individual's well-being and contribution to society. Work on the Social Outcomes of Learning examines the evidence on how education influences health, civic participation and social engagement.

The strong OECD focus on outcomes is set to expand beyond teenage achievements as surveys of adult competences (Programme for the International Assessment of Adult Competencies [PIAAC], see Chapter 5) and outcomes from higher education (Assessment of Higher Education Learning Outcomes [AHELO], see Chapter 4) are in development. The new work on Improving School Outcomes is designed to help countries choose the best tools to assess and improve outcomes.

KEY FINDINGS

Among OECD countries, students in Finland and Korea, with non-members Chinese Taipei and Hong Kong-China, perform above the other countries in mathematics: In these countries in 2006 the mean scores in mathematics were closely grouped between 549 and 547, some way above the next-highest scoring country, the Netherlands (531). Compared with an OECD average of 13.4% attaining the top levels 5 and 6, 27.1% do so in Korea and even more do at 31.9% and 27.7% in Chinese Taipei and Hong Kong-China, respectively. At least one in five students is also proficient in complex mathematics tasks (PISA level 5 or 6) in Belgium, Finland, the Netherlands and Switzerland. In all these countries, there are significant pools of young people with high-level mathematical skills who are likely to play a crucial role in advancing the knowledge economy.

📖 *PISA 2006: Science Competencies for Tomorrow's World: Volume 1: Analysis*, 2007, Chapter 6

Very few countries do not escape having significant minorities, or even a majority, of students with very low performance in mathematics: With the exception of Finland and Korea, all OECD countries have at least 10% of students who achieve at only PISA level 1 or below. In 13 OECD countries (Austria, the Slovak Republic, Hungary, Norway, France, Luxembourg, Spain, the United States, Portugal, Greece, Italy, Turkey, Mexico) this accounts for a fifth or more of the students. The lowest-achieving students in mathematics are actually the majority of 15-year-olds in Mexico (56.5%).

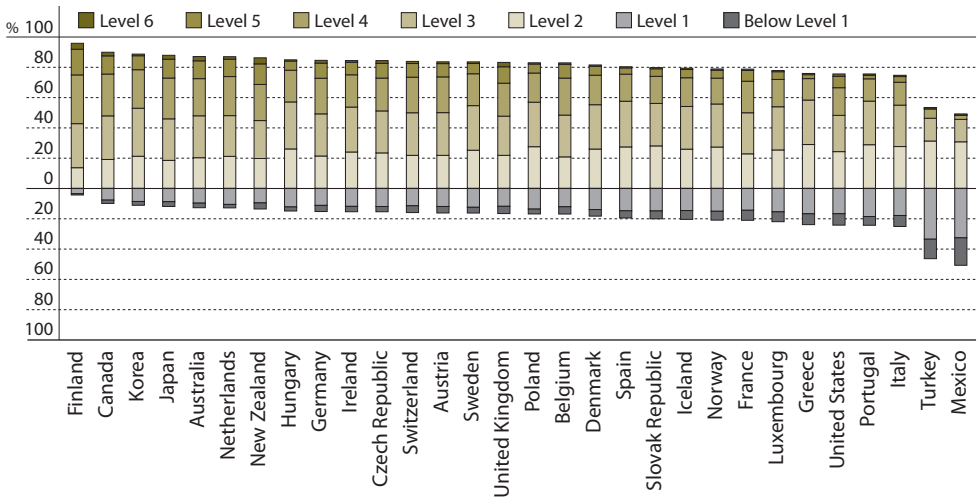
📖 *PISA 2006: Science Competencies for Tomorrow's World: Volume 1: Analysis*, 2007, Chapter 6

In only five OECD countries do more than two-thirds of young people reach or surpass PISA level 3 in reading literacy – the level which involves comprehension and interpretation of moderately complex text: The five countries are Canada, Finland, Ireland, Korea and New Zealand. The average attaining level 3 or above across all OECD countries is 57.1%. Having a high proportion achieving this basic threshold level does not automatically mean that the country has among the highest numbers of top performers: the proportion in Korea attaining the top level 5 (21.7%) is nearly double that achieved in Ireland (11.7%).

📖 *PISA 2006: Science Competencies for Tomorrow's World: Volume 1: Analysis*, 2007, Chapter 6

Figure 6.1.

The spread of student proficiency levels in science in OECD countries (2006)



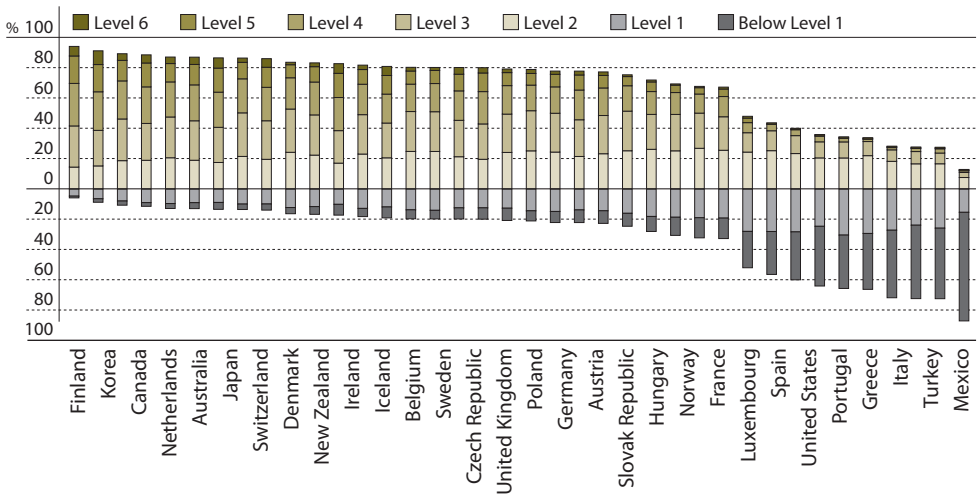
Note: Countries are ranked in descending order of percentages of 15-year-olds at levels 2 and over.

Source: OECD (2007), *PISA 2006: Science Competencies for Tomorrow's World: Volume 1: Analysis*, OECD Publishing.

StatLink http://dx.doi.org/10.1787/141844475532

Figure 6.2.

The spread of student proficiency levels in mathematics in OECD countries (2006)



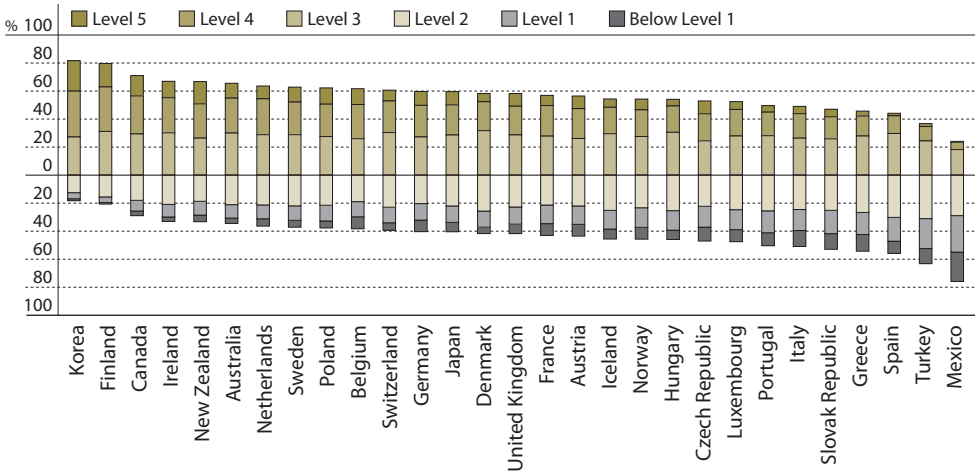
Note: Countries are ranked in descending order of percentages of 15-year-olds at levels 2 and over.

Source: OECD (2007), *PISA 2006: Science Competencies for Tomorrow's World: Volume 1: Analysis*, OECD Publishing.

StatLink http://dx.doi.org/10.1787/142046885031

Figure 6.3.

The spread of student proficiency levels in reading in OECD countries (2006)



Note: Countries are ranked in descending order of percentages of 15-year-olds at levels 2 and over.
Source: OECD (2007), *PISA 2006: Science Competencies for Tomorrow's World: Volume 1: Analysis*, OECD Publishing.

StatLink http://dx.doi.org/10.1787/142046885031

In 18 OECD countries, 40% or more do not achieve the level 3 threshold in reading literacy, and these low-performing students are the majority in 4 of these countries: The countries which have 40% or more achieving at best at level 2 are Austria, the Czech Republic, Denmark, France, Germany, Japan, Greece, Hungary, Iceland, Italy, Luxembourg, Mexico, Norway, Portugal, the Slovak Republic, Spain, Turkey and the United Kingdom. They are the majority of students in Greece, Italy, Mexico, Portugal, the Slovak Republic, Spain and Turkey.

PISA 2006: Science Competencies for Tomorrow's World: Volume 1: Analysis, 2007, Chapter 6

The top performers in science among OECD countries are Finland, followed by Canada, Japan, Korea, New Zealand, Australia and the Netherlands: With OECD countries fixed at an average of 500, the top performer on the combined science scale in 2006 was Finland clearly ahead at 563. Canada (534), Japan, Korea, New Zealand, Australia and the Netherlands (525) are the next group of top-performing OECD countries in science, all at levels 525 and above. On average in these countries, only 1.3% of 15-year-olds reach the top level 6, but in Finland and New Zealand over 3.9% do so. The percentage of these very top science performers is also relatively high (between 2.1% and 2.9%) in Australia, Canada, Japan and the United Kingdom.

PISA 2006: Science Competencies for Tomorrow's World: Volume 1: Analysis, 2007, Chapter 2

The gender gap in science performance is small: For most OECD countries there are no statistically significant differences in science performance between young women and men. In six of these countries – Denmark, Luxembourg, Mexico, the Netherlands, Switzerland and the United Kingdom – there is a male advantage, but it is relatively small (between 6 and 10 points). In Turkey and Greece, a somewhat larger female advantage in science (11-12 points) was found in 2006.

PISA 2006: Science Competencies for Tomorrow's World: Volume 1: Analysis, 2007, Chapter 2

Investment in early childhood education and care brings significant returns to individuals and society: Research from diverse countries suggests a common conclusion that investment in young children brings significant benefits not only for children and families, but also for society at large. High quality early childhood services lay a strong foundation of learning which is fundamental to the rest of the lives of the individuals involved. Children from disadvantaged backgrounds, in particular, benefit from acquiring such a foundation. Early childhood investments bring: significant educational, social, economic and labour market returns; improved transitions from one educational level to the next; higher achievement; and lower crime rates among teenagers. Lack of investment in children's services can result in child-care shortages and unequal access, even segregation, of children according to income. Unavailability of services raises barriers against women's full-time employment – with the economic and social consequences which flow from that – and tends to channel women towards low-paid, part-time jobs.

📖 *Starting Strong II: Early Childhood Education and Care*, 2006, Annex D

Attaining at least upper secondary education is an important hedge against the risk of unemployment: The unemployment rate among those adults aged 25-64 years with an upper secondary education is clearly lower than among those who have not got further than the lower secondary level – on average nearly 4 percentage points lower in 2008. This gap is particular high in the Eastern European OECD countries of the Czech Republic (14 percentage point gap), Hungary (11) and the Slovak Republic (29), and is also high in Germany (9), and in these countries the gap has grown over the past decade. Expressing this upper secondary advantage as a ratio of unemployment rates, those with upper secondary education are half or less than half as likely to be unemployed compared with those with lower secondary education in Austria, the Czech Republic, Germany, Hungary, Norway, the Slovak Republic and Switzerland. There is, however, a group of countries – Chile, Greece, Korea, Luxembourg, Mexico and partner country Brazil – where there is no greater unemployment risk among those finishing education at the lower, compared with the upper secondary, level.

📖 *Education at a Glance 2010: OECD Indicators*, 2010, Indicator A6

In most countries the earnings pay-off for adults having acquired an upper secondary education is clear… but not everywhere: The countries with the highest earnings advantage of those with upper secondary compared with lower secondary education for all working-age adults are Austria, Korea, Portugal, Turkey, the United Kingdom and the United States; in these countries, those with the lower attainments earn around only two-thirds to 70% of upper secondary graduates. The differences can be very marked: Turkish women with lower secondary education earn less than half the incomes of Turkish women with upper secondary education, and in partner country Brazil both men and women with lower secondary education earn only around half of those with upper secondary attainment. There are, however, countries in which the earnings advantage of upper secondary graduates is not particularly marked – the lower attainers earn 90% or more of those with upper secondary education – as is found in Finland for men and women, for men in Belgium, Germany and the partner country Estonia and, for women, in Korea.

📖 *Education at a Glance 2010: OECD Indicators*, 2010, Indicator A7

There is a strong positive relationship between education and the average earnings of individuals, with marked premiums for those with tertiary-level attainments: In all countries, graduates of tertiary education earn substantially more than upper secondary graduates who in turn earn more than those whose attainment does not go beyond basic education. Earnings differentials between higher education and upper secondary graduates are generally greater than between upper and lower secondary

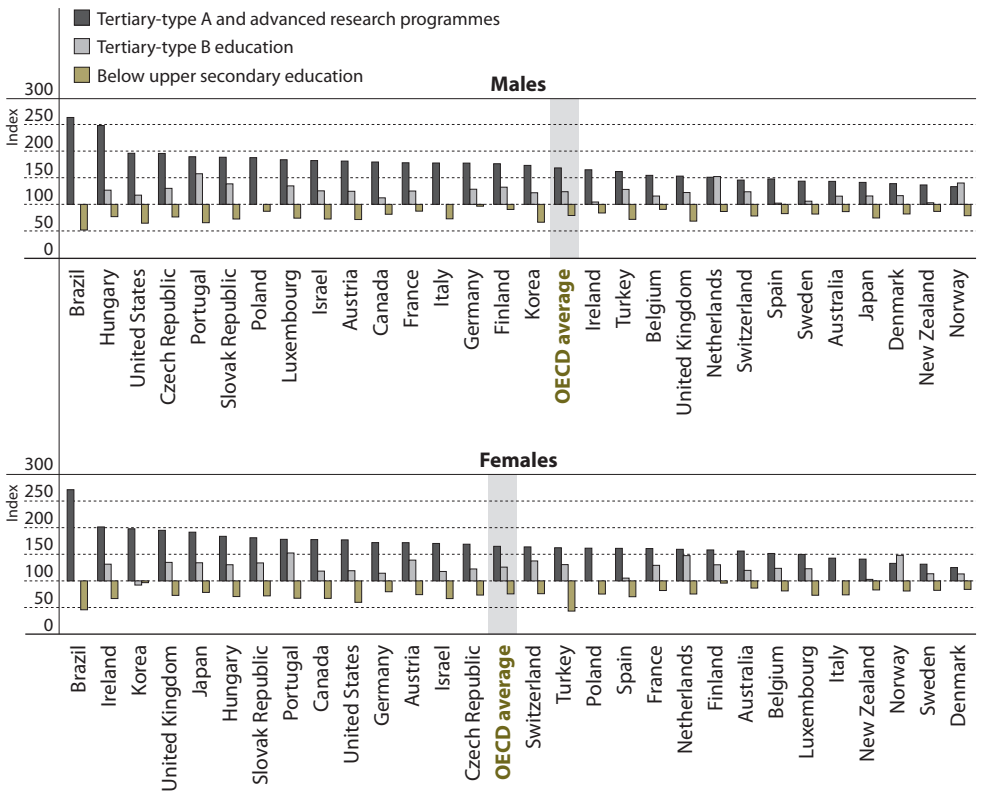
graduates. The earnings premium for tertiary over upper secondary graduates, all adult ages and men and women combined, ranges from a high of 2.10 times the incomes of the upper secondary group in Hungary (and 2.54 in partner country Brazil) to a modest 1.18 higher in New Zealand.

Education at a Glance 2010: OECD Indicators, 2010, Indicator A7

Figure 6.4.

Relative earnings from employment, by level of educational attainment and gender for 25-64 year-olds (2008 or latest year available)

Upper secondary and post-secondary non-tertiary education = 100



Source: OECD (2010), *Education at a Glance 2010: OECD Indicators*, OECD Publishing.

StatLink http://dx.doi.org/10.1787/888932310206

Even when the additional costs of acquiring more education are taken into account, the higher average subsequent earnings mean that it pays to continue to upper over lower secondary education: For men and women, continuing on to upper secondary education after the lower secondary level pays off on average in all countries. For men, this "private" rate of return stands at 10.6% on average across the 20 OECD countries permitting these calculations, and over 12% in 8 of these countries. The range lies between 4.4% (the Netherlands) and 5.8% (Denmark), to 17.6% (the Czech Republic) and approximately

14% in Australia and Sweden. The range is greater for women, lying between 0.9% in Korea and less than 5% in three countries (Denmark, the Netherlands and New Zealand), up to 20% in the Czech Republic. The average individual rate of return for women for upper secondary education is 9.3%.

📖 *Education at a Glance 2010: OECD Indicators*, 2010, Indicator A8

Though the costs associated with tertiary education can be substantial, they are more than offset by enhanced subsequent average earnings: The relative advantage of continuing on to acquire tertiary over upper secondary education is also positive in all the countries with data, with even larger incentives to continue. For men, it is 11.5% in the 20 countries and 10.7% for women. The rate of return advantage of continuing to tertiary beyond upper secondary rises to 20% or more for men in the Czech Republic and Poland, and to 19% or more for women in the Czech Republic, Poland and Turkey. The countries where the rates of return on higher education are lowest for men and women are Denmark, the Netherlands and Sweden.

📖 *Education at a Glance 2010: OECD Indicators*, 2010, Indicator A8

Projections suggest that there are enormous economic gains to be obtained by OECD countries that can improve the cognitive skills – and not just the educational attainment – of their populations: Projections based on historical relationships (bearing in mind the uncertainties of future projections) suggest that if all OECD countries could boost their average PISA scores by 25 points over the next two decades, the aggregate gain of OECD GDP would be USD 115 trillion over the lifetime of the generation born in 2010. Even more ambitious goals, such as bringing all students to the OECD level of minimal proficiency – a PISA score of 400 – are associated with aggregate GDP increases of nearly USD 200 trillion. Bringing all countries up to the OECD's best performing education system in PISA, Finland, would result in gains in the order of USD 260 trillion. It is the quality of learning outcomes, not the length of schooling, which makes the difference.

📖 *The High Cost of Low Educational Performance: The Long-run Economic Impact of Improving PISA Outcomes,* 2010

Public investment in initial vocational education and training (VET) can make up for insufficient employer provision and delivers good economic returns: Much occupation-specific training is provided by employers but, if left to themselves, they will often not provide their own employees with sufficient training, particularly in transferable skills. Initial VET is designed to fill the gap by providing the needed skills, and research has shown that it can yield good economic returns from the public investment involved. Countries with strong initial VET systems like Germany have been relatively successful in tackling youth unemployment.

📖 *Learning for Jobs*, 2010, Chapter 1

Educational attainment positively enhances health, political interest and trust, with thresholds for the upper secondary level regarding health and for tertiary education with political interest: Adults with higher levels of educational attainment are generally more likely to report that their health is at least good, that they are at least fairly interested in politics, and believe that most people can be trusted. For health, the step in attainment from lower to upper secondary education tends to show up as most influential, while the step up to tertiary is more apparent regarding political interest; no consistent thresholds are apparent regarding trust. The association between education and social outcomes generally remains strong even after adjusting for age, gender and income.

📖 *Education at a Glance 2010: OECD Indicators*, 2010, Indicator A9; *Understanding the Social Outcomes of Learning*, 2007; *Improving Health and Social Cohesion through Education,* forthcoming

Low adult literacy and competency scores are strongly associated with risks of unemployment and insecurity: The first Adult Literacy and Life Skills Survey measured adults' prose, document, numeracy and problem-solving skills across five broad levels of proficiency. Level 3 is identified as the suitable minimum for managing the demands of work and daily life. Based on data gathered from Canada, Italy, Norway, Switzerland, the United States and the Mexican State of Nuevo Leon, as well as Bermuda:

- Individuals whose numeracy scores are at levels 1 and 2 are two to three times more likely to be outside the labour force for six or more months than those with higher scores.
- For young adults, proficiency in document literacy and numeracy is strongly associated with finding employment; young adults scoring at levels 1 and 2 are more likely to stay unemployed for longer periods of time.

📖 *Learning a Living: First Results of the Adult Literacy and Life Skills Survey*, 2005

Training enhances wages and job prospects, especially for younger, mobile and highly-educated workers: Adult education and training have a significant impact on both worker productivity and wage levels. Diverse national and international panel studies (altogether covering 13 European countries and the United States) have come up with wage premiums resulting from participation in training courses ranging from negligible in France to 2.5% annually in Germany and 5% in Portugal. Training tends also to reduce the chance of being unemployed and increases chances of reemployment in the case of lay-off. The wage gains associated with the training are improved when workers move on from their employers; the higher premiums come from learning taken with previous employers and with the best results for young and highly-educated workers.

📖 *Promoting Adult Learning*, 2005, Chapter 2; *OECD Employment Outlook 2004*, 2004, Chapter 4

Recognition of non-formal and informal learning delivers economic, educational, social and psychological benefits: Recognition of non-formal and informal learning generates economic benefits: it reduces both the costs associated with, and the time required to acquire qualifications in, formal education. It also allows human capital to be deployed more productively by giving people access to jobs that better match their true skills. Recognition provides educational benefits by helping people learn about themselves and develop their career within a lifelong learning framework. It provides social benefits by improving equity through giving access to further education and the labour market to disadvantaged minority groups, disaffected youth, and older workers who missed out on education earlier. Recognition can provide psychological benefits by making people aware of their capabilities and offering external validation of their worth.

📖 *Recognising Non-formal and Informal Learning: Outcomes, Policies and Practices*, 2010, Executive Summary

POLICY DIRECTIONS

Education needs to re-invent itself in order to improve the performance of systems and to raise value for money: This will be a tremendous challenge for public policy. It will require often supply-driven education systems to develop effective mechanisms to understand and respond to rapidly-changing economic and social demands for competencies. Effective policies will require understanding not just of the development of competencies, but also of how effectively economies use their talent pool, and of how competencies in turn feed into better jobs, higher productivity, and positive economic and social outcomes. The success of education systems will be measured less by how much countries spend on education or how many complete a degree, and more by the educational outcomes achieved and by their impact on economic and social progress.

📖 *Education at a Glance 2010: OECD Indicators*, 2010, Editorial

Foster student interest in science, mathematics and technology education as an explicit objective: Recognising that a declining interest in science, mathematics and technology studies is of particular concern in many countries, and considering that students' motivation and engagement in these areas closely relate to their achievement and potentially to their future career choices, the OECD encourages educational policies and practices that foster students' interest and engagement in science, mathematics and technology. Considering the strong association between gender differences in interest and motivation in science-related areas at school and subsequent patterns of educational and career pathways, the OECD also suggests to place greater emphasis on engaging female students in these subject areas.

📖 *Education Policy Analysis 2006: Focus on Higher Education*, 2006, Chapter 5

Countries should aim to secure similar student performance among schools: Low "between-school variation" means that there is no obvious advantage in terms of performance for a student to attend one school as opposed to another – they all perform to broadly equal levels. In three countries – Norway, Finland and Iceland – less than 10% of variation in mathematics achievement in 2003 was accounted for by such differences – all the rest of the variation is "within-school". The OECD average is much higher than 10% and stands at almost exactly a third. The countries where it is over 60% are Turkey, Hungary and Japan. Securing similar student performance among schools is both important in itself as a policy goal and is compatible with high overall performance standards.

📖 *Education at a Glance 2006: OECD Indicators*, 2006, Indicator A5

Clarify returns to training by augmenting information and removing structural barriers, and by making the outcomes more transparent to individuals and firms: Effective dissemination of information can help convince individuals and firms of the benefits of training. Cost/benefit analysis provides information that can encourage and motivate adults to learn, as well as clarifying who should cover the financial costs. Efforts to stimulate firms to invest in training would be assisted by promoting the transparency of human capital investments in company accounting. Acting directly on increasing the returns to training through alternative mechanisms, such as embedding skill improvements in the wage determination process, can improve training take-up and firm productivity. The development of national qualifications systems provides a sort of currency in this respect and recognition of informal and non-formal learning contributes to reducing the opportunity cost of learning.

📖 *Promoting Adult Learning*, 2005, Chapter 2

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