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Education Today
The OECD Perspective

Chapter 7

Outcomes, Benefits and Returns

Very rich information on educational outcomes has been generated through OECD work, especially with the triennial PISA achievement surveys. These survey the achievements of 15-year-olds in different competence areas, together with a growing range of associated background information, and in many non-member countries as well as those of the OECD. These surveys reveal the wide differences between countries. In charting patterns, very large numbers still do not attain at levels that might be regarded as the minimum for 21st century knowledge economies. The strong OECD focus on outcomes is set to expand beyond teenage achievements as surveys of adult competences and outcomes from higher education are in development. There is also expanding analysis of returns to education within OECD, including outside the Directorate for Education. Findings confirm the positive returns to higher levels of educational attainment on a variety of measures, certainly for the individual, though with much more to be done to make educational benefits more transparent to learners themselves.

7.1. Key findings and conclusions

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 are proficient in complex mathematics tasks, at PISA level 5 or 6, in Finland, Switzerland, Belgium and the Netherlands. In these countries, significant pools exist of young people with high-level mathematical skills who are likely to play a crucial role in advancing the knowledge economy.
📖 *PISA 2006 – 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, France, Greece, Hungary, Italy, Luxembourg, Mexico, Norway, Portugal, the Slovak Republic, Spain, Turkey, the United States) 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 – Volume 1: Analysis*, 2007, Chapter 6.

Low spread in student performance can go hand-in-hand with high levels of excellence: Six of the countries with the smallest differences in the range defined by the mathematics score which marks the cut-off between the top quarter of students and the rest (75th percentile) and between the three-quarters mark and below (25th percentile) – Canada, Finland, Iceland, Ireland, Japan and Korea – all perform significantly above the OECD average in 2000. Four of these with low spread in maths scores – Canada, Finland, Japan and Korea – are among the six best-performing OECD countries in mathematics literacy (the others in the top six being Australia and New Zealand). Hence, significant numbers achieving at a high level does not automatically bring with it widening gaps with the others.
📖 *Education at a Glance: OECD Indicators – 2004 Edition*, Chapter A.

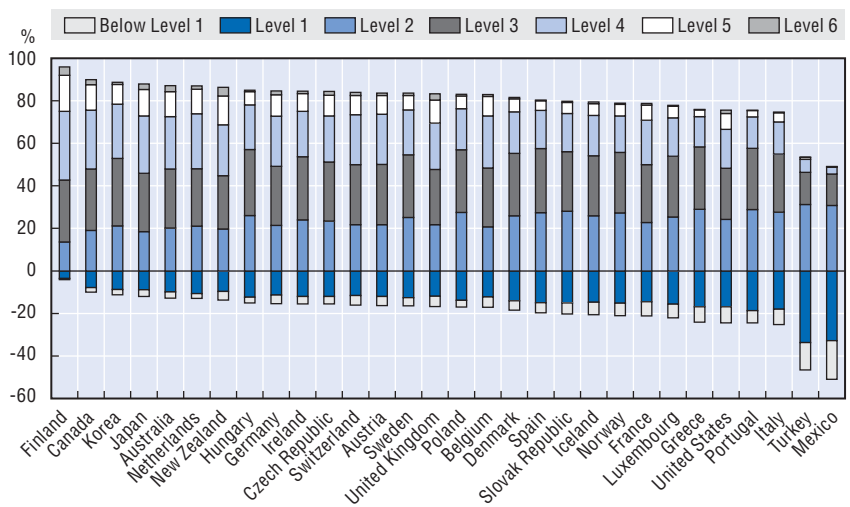
In only 5 OECD countries do more than two-thirds of young people reach or surpass PISA level 3 in reading literacy – the level which involves comprehension and interpretation of moderately complex text: The five countries are Canada, Finland, Ireland, Korea, and New Zealand. The average attaining level 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 – Volume 1: Analysis*, 2007, Chapter 6.

In 18 OECD countries, 40% or more do not achieve at the level 3 threshold in reading literacy, and these low-performing students are in the majority in four of these countries: The countries which have 40% or more achieving at best at levels 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 – Volume 1: Analysis*, 2007, Chapter 6.

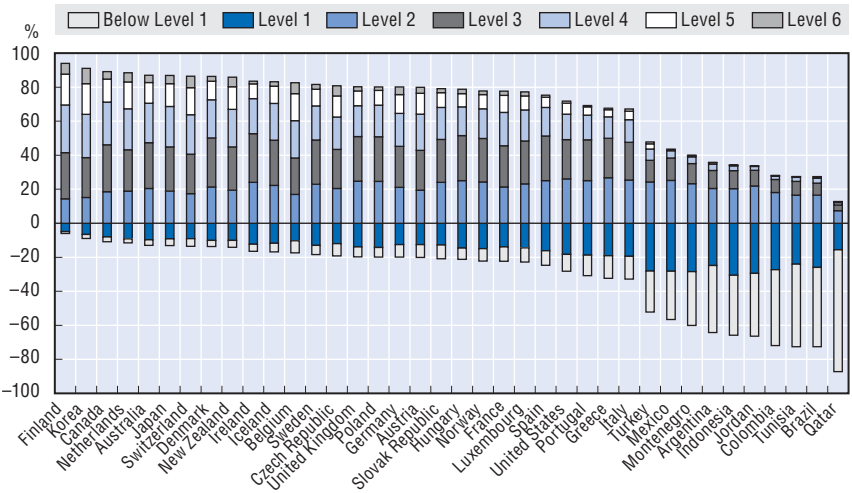
Figure 7.1. **Percentages in each PISA proficiency level in science (2006)**



Note: Countries are ordered left to right in descending percentages of 15-year-olds at levels 2 and over.
Source: OECD (2007), *PISA 2006 – Volume 1: Analysis*, OECD Publishing, Paris.

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

Figure 7.2. **Percentages in each PISA proficiency level in mathematics (2006)**



Note: Countries are ordered left to right in descending percentages of 15-year-olds at levels 2 and over.
Source: OECD (2007), *PISA 2006 – Volume 1: Analysis*, OECD Publishing, Paris.

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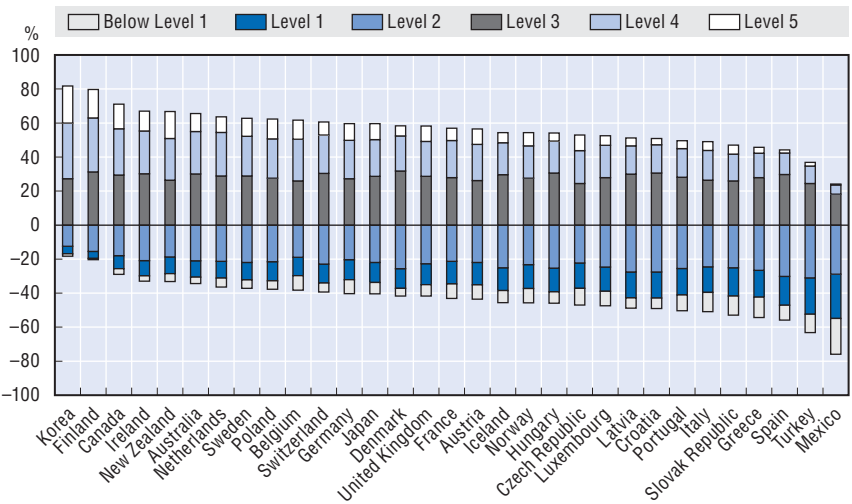
Figure 7.3. **Percentages in each PISA proficiency level in reading (2006)**



Note: Countries are ordered left to right in descending percentages of 15-year-olds at levels 2 and over.
Source: OECD (2007), *PISA 2006 – Volume 1: Analysis*, OECD Publishing, Paris.

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

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The top performers in science among OECD countries are Finland, followed by Australia, Canada, Japan, Korea, the Netherlands and New Zealand: 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. Australia, Canada, Japan, Korea, the Netherlands, and New Zealand are the next group of top-performing OECD countries in science, all at 522 or 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 – 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 6 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 – 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 the 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 background 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 and 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 gone further than the lower secondary level – on average 4.2 percentage points lower in 2006. This gap is particularly high in the eastern European OECD countries of the Czech Republic (16.8 percentage gap) and the Slovak Republic (34), and in Germany (10), and in these three the gap has grown markedly 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, Denmark, Germany, Hungary, Norway, the Slovak Republic, and Switzerland. There is a small number of countries – Greece, Korea, Mexico, and Turkey – where there is no greater unemployment risk among those finishing education at the lower, compared with the upper, secondary level.

📖 *Education at a Glance: OECD Indicators – 2008 Edition*, Chapter A.

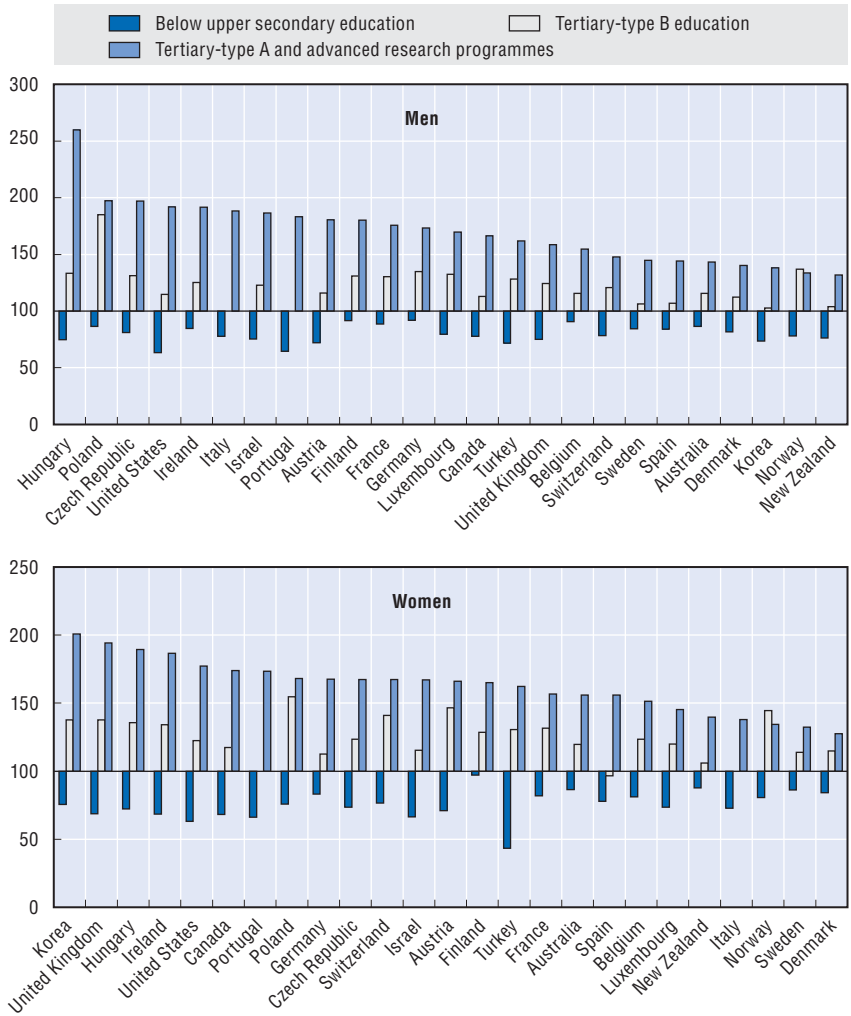
In some countries the earnings pay-off of acquiring an upper secondary education is considerable ... The countries with the highest earnings advantage of those with upper secondary compared with lower secondary education for all working-age adults are Austria, Korea, Portugal, Turkey, the United Kingdom, and the United States; in these countries, those with the lower attainments earn around only two-thirds to 70% of upper secondary graduates. The gaps for these particular countries tend to narrow somewhat for younger as compared with all adults, especially in Korea where the gap disappears, though in Austria and Turkey in particular the income difference stays much the same whether for younger or all adults. Turkish women of all ages and especially in the younger age bracket earn less than half the incomes of Turkish women with upper secondary education.

... but not everywhere does completing upper secondary education represent an important earnings threshold: There are countries in which the earnings advantage of upper secondary over those who left education with no more than lower secondary attainments is not particularly marked – the lower attainers earn 90% or more of those with upper secondary education. In these cases instead, the main difference is between those who finished with secondary-level compared with tertiary-level attainment. Of the 25 countries supplying the data to permit such calculations for adults aged 25 to 64 years these are Belgium (for men), Finland, and Germany (men); among younger adults aged 25-34, this narrower advantage is found in Australia (men), Belgium (men), Finland, Germany (men), Korea (women, where younger women with lower secondary attainment earn 1.26 *more* than those with upper secondary education), the Netherlands (men), and Spain (men).

📖 *Education at a Glance: OECD Indicators – 2008 Edition*, Chapter A.

Figure 7.4. **Earnings from employment by level of educational attainment for 25-to-64-years-olds by gender, 2006 or latest available year**

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



Source: OECD (2008), *Education at a Glance: OECD Indicators – 2008 Edition*, OECD Publishing, Paris.

StatLink http://dx.doi.org/10.1787/401781614508

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. The earnings premium of tertiary graduates has gone up in most countries over the past 10 years, especially in Germany, Hungary, Ireland, and Italy (but with some exceptions – New Zealand and Spain). 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 2.19 times the incomes of the upper secondary group in Hungary to a low of 1.15 higher in New Zealand.
📖 *Education at a Glance: OECD Indicators – 2008 Edition*, Chapter A.

Factoring in the costs of acquiring the next higher level of education to arrive at "private rates of return" shows that, on average, it always 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% or more in 8 of the 19 countries, with the range lying between 6.1% (France) and 6.7% (Denmark) to 18% (the United Kingdom) and 17.5% (the United States). The range is greater for women, lying between 1.5% in Korea and four countries (Denmark, France, Norway and Switzerland) where it stands between 5% and 6%, up to 15.6% (United States) and 18.5% (United Kingdom).

... with even higher average pay-offs for continuing on to tertiary over upper secondary education: 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 10% or more in 10 of the 19 countries (lowest in Denmark [4.4%] and Sweden [5.1%]) and in the same number of countries for women (again with Denmark and Sweden with the lowest returns). The rate of return advantage of continuing to tertiary beyond upper secondary rises to 20% or more for men in the Czech Republic, Hungary (19.8%), Poland and Portugal, and for women in the Czech Republic and Portugal.
📖 *Education at a Glance: OECD Indicators – 2008 Edition*, Chapter A.

International comparisons show that education plays a pivotal role in fostering labour productivity and economic growth: A country able to attain literacy scores 1% higher than the international average will achieve levels of labour productivity and GDP per capita that are 2.5 and 1.5% higher respectively than those of other countries. Literacy scores as measures of human capital have higher associations with economic growth than indicators of schooling. The International Adult Literacy Survey offers two explanations as to why this might

be so: literacy might be a superior measure of some key driver of growth and data on literacy might be more comparable than that on educational attainment.

📖 *Education at a Glance: OECD Indicators – 2006 Edition*, Chapter A; Coulombe *et al.*, 2004.

Low adult literacy and competency scores are strongly associated with the 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.

More years of schooling are associated with better health and well-being, enhancing the social returns to educational investment via lower health expenditure: There are *direct* effects of education on health via changes in individual behaviour; *indirect* effects of education on health, such as those via income; and *intergenerational* effects of educated parents on the health of their children. Important though hard to quantify are the benefits which come with the enhancement of well-being and the quality of life: as well as preventing illness or enabling its more efficient treatment, education enables people to live more positively healthy lives. The "cost containment" benefits are more open to measurement, and simulation studies have proposed estimates for the health savings that might flow from raising attainment by an additional year of education or ensuring that all attain basic qualifications.

📖 *Understanding the Social Outcomes of Learning*, 2007, Chapter 5.

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; Ok and Tergeist, 2003; *Employment Outlook – 2004 Edition*, Chapter 4.

7.2. Orientations for policy

Improve educational outcomes for all through more challenging and supportive learning environments as a way of maintaining economic competitiveness: OECD countries' capacity to compete in the global knowledge economy depends on whether they can meet the fast-growing demand for high-level skills. This in turn will hinge on significant improvements in the quality of schooling outcomes and a more equitable distribution of learning opportunities. Education systems need to develop more challenging and more supportive learning environments and be more effective and flexible in improving learning outcomes.

📖 *Education at a Glance: OECD Indicators – 2006 Edition*, Editorial.

Foster student interest in science, mathematics and technology education as an explicit objective: Recognising that a declining interest in studying science, mathematics and technology 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. The OECD also suggests to place greater emphasis on engaging female students in these subject areas.

📖 *Education Policy Analysis – 2006 Edition*, 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: OECD Indicators – 2006 Edition*, Chapter A.

A broad framework of fundamental competences can inform assessment: Education and lifelong learning systems can be assessed in terms of their success in developing the key competences needed to function in today's complex demanding society, which go well beyond any particular level or educational setting. Three clusters of such key competences have been elaborated through the OECD DeSeCo Project ("The Definition and Selection of Key Competences", 2004), each further divided into three components:

1. **Using tools interactively:** a) The ability to use language, symbols and text interactively; b) The ability to use knowledge and information interactively; c) The ability to use technology interactively.
2. **Interacting in heterogeneous groups:** a) The ability to relate well to others; b) The ability to co-operate; c) The ability to manage and resolve conflicts.
3. **Acting autonomously:** a) The ability to act within the big picture; b) The ability to form and conduct life plans and personal projects; c) The ability to assert rights, interests, limits and needs.

Invest in analyses to reveal the returns and make more precise the benefits of different patterns of lifelong learning: The vitality of the public debate on lifelong learning has depended heavily on the assumption that it is a sound investment – for economies, societies and individuals. To date, the evidence is very thin. Preliminary work by the OECD provides encouraging results but such work needs to be broadened to more countries and fine-tuned. It needs to consider not only average returns to learning over the lifetime but the dispersion of returns in order to clarify the extent and distribution of the risks entailed by the investment.

📖 *Co-financing Lifelong Learning: Towards a Systemic Approach*, 2004, Chapter 4.

Clarify and improve returns to training by augmenting available information and removing structural barriers ... Efforts to improve research and dissemination of information can help convince individuals and firms of the benefits involved. Cost/benefit analysis provides information that can encourage and motivate adults to engage in learning as well as clarifying who should cover the financial costs. Evidence of other social and personal effects such as useful course content, greater self-esteem and increased social interaction can also help improve participation. Efforts to stimulate firms to invest in training can 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.

... and by making the outcomes transparent – and easily signalled to individuals and firms: The development of national qualifications systems

provides a sort of currency in this respect. Recognition of informal and non-formal learning can contribute to reducing the opportunity cost of learning. Experience shows that many countries are adopting the practice because the benefits can be substantial and can help realise a culture of lifelong learning.
📖 *Promoting Adult Learning*, 2005, Chapter 2.

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