Trends Shaping Education 2010

Centre for Educational Research and Innovation

OECD

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ISBN 978-92-64-07526-9 (print)
ISBN 978-92-64-09004-0 (PDF)

Also available in French: *Les grandes mutations qui transforment l'éducation 2010*

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Foreword

This book is designed to give policy makers, researchers, educational leaders, administrators and teachers a robust, non-specialist source to inform strategic thinking and stimulate reflection on the challenges facing education, whether in schools, universities or in programmes for older adults. It will also be of interest to students and the wider public, including parents.

Trends Shaping Education 2010 *provides an overview of key economic, social, demographic and technological trends and raises pertinent questions about their impact on education. This compilation makes use of a variety of robust international sources of data, including the OECD, the World Bank and the United Nations.*

The first edition of this book was published in 2008. In preparation for this 2010 edition the content was significantly reviewed, with all data updated, a number of new indicators added and many extended to include more countries. The thematic arrangement of the trends has also been revised. The process of review profited from the valuable input of members of the CERI governing board.

Within the OECD Centre for Educational Research and Innovation (CERI), this publication was written by Henno Theisens, Kelly Roberts and David Istance. Therese Walsh, Lynda Hawe and Peter Vogelpoel contributed to the final stages of preparation for publication.

TABLE OF CONTENTS

FIGURES

Introduction

What does it mean for education that our societies are becoming more diverse? What does it mean that ICT is playing an ever larger role in our lives? Does it matter for higher education providers that the share of national wealth spent on research and development is increasing?

This book is about major developments that are affecting the future of education and setting challenges for policy makers and education providers alike. It does not give conclusive answers: it is not an analytical report nor is it a statistical compendium, and it is certainly not a statement of OECD policy on these different developments. It is instead a stimulus for thinking about major trends with the potential to influence education. While the trends are robust, the questions raised for education in this book are illustrative and suggestive. We invite users to look further and to add to this basic coverage examples of trends from their own countries or regions.

WHAT CAN BE FOUND IN THIS PUBLICATION?

This resource contains 27 trend areas each illustrated by two figures on specific trends. The material is organised in five main chapters focussing on globalisation, social challenges, the world of work, children and families, and technology. While all the trends included are relevant to education, not all relevant trends are in this resource – it is necessarily highly selective. As well as relevance for education, the criterion for selection has been the availability of internationally comparable, through-time evidence. This inevitably biases the report's coverage towards measurable economic, social, environmental, demographic and educational fields and ones where the measurement has been in place long enough to give a picture of developments over time. Some of the factors importantly shaping education are highly subjective and cultural in content, making them difficult to pin down at any one time, let alone over time, and these are not covered.

The focus is primarily on OECD countries although, where they are available, broader global data are used. The different sources mean that there is no single time frame: in some cases, the trends are charted over a short decade; in some others, longer-term trends are available. The recent global financial crisis is largely outside the scope of this book, given our focus on trends over a longer time frame. The crisis is impacting on developments such as economic growth or poverty and so, where appropriate, we refer to it in this context.

FOR WHOM IS THIS TOOL RELEVANT?

This tool is relevant for everyone active in the field of education. We have sought to avoid jargon and technical terminology, and the data are presented in an accessible format. Users interested in further reading or in the precise definitions of terms used in the figures and the text are referred to the "find out more" sections at the end of each chapter. Users interested in the data underlying the figures as well as more technical

details of the data are referred to the Excel files that can be accessed by using the links below each figure.

Among those for whom this tool will be most relevant are:

- **Policy makers, officials, advisors, researchers and policy analysts** needing robust trends to reflect on the long-term development of education.
- **Leaders of educational institutions and other stakeholders** involved in setting strategy may well find the trends pertinent to the choices they face.
- **Teacher educators** may wish to use the trends as material for teacher education or professional development programmes to help student teachers consider their futures and professional practice.
- **Teachers** may want to use this book as an aid for professional development and a starting point for reflection on practice and curriculum issues.

There are doubtless others who will find this book relevant; the choice of trends and the treatment given to them in the text, however, are designed especially for those working in the educational field.

TRENDS SHAPING EDUCATION

In assembling the trends in this book we start with the "big picture" global changes before honing in on societies and labour markets and then the more "micro" level of families and children. We also deal with technology, which affects all these different layers but which we bring together in a separate chapter. Change is happening in all these spheres and levels, much of it interconnected, as summarised briefly below.

The dynamics of globalisation

One of the most important and pervasive trends is globalisation. In essence, globalisation is the widening, deepening and speeding up of connections across national borders. One of the key areas where this occurs is in the economy; where the flow of ever-greater quantities of goods, services and capital is taking place around the globe. People move more freely as well, bringing greater ethnic and cultural diversity to OECD countries. Facilitated by fast-changing technology, information also flows more freely and communication has become far easier between people anywhere in the world. There are global challenges too with climate change a good example, as both the phenomenon and its solutions are global.

The nodes in this global network are cities. By the year 2050 around 70% of the world's population is expected to be living in cities, and even more than this within OECD countries and the rapidly-emerging economies. People flock to cities because they are the powerhouses of the economy, the places where jobs and wealth are created. Proximity to international transport, availability of telecommunication and the resources to make use of these allow greater links between cities. City life has a distinct quality compared with rural life, to the extent that cities in two very different countries, such as New York City and Shanghai, will tend to have more in common than each would have with rural communities in their own country.

Cities are becoming increasingly important, but so are new countries: Brazil, China, India, Russia and South Africa have become significant powers in the global community.

These countries have large and fast-changing economies and play an increasingly important political role in global affairs, as through, for example, the G20.

Globalisation notwithstanding, in comparing levels of wealth and health the differences between regions of the world remain very large, particularly between the OECD countries and the rest of the world.

New social challenges

At the same time as globalisation is transforming the world at large, societies are also experiencing significant change. One of the most fundamental trends in OECD societies is that they are ageing, as a result of both higher life expectancy and lower birth rates. Ageing societies experience higher dependency ratios and potentially lower tax revenues, as well as growing pension and health costs. These developments seriously challenge the long-term sustainability of current public and private expenditure including on education; they also raise questions about the retirement age and the place of the elderly in society.

Income inequality is going up across OECD countries. In most of them, all income groups are better off now than ten years ago, but those with higher incomes have tended to gain more. This increased inequality has resulted in higher levels of relative poverty in most OECD countries – not everyone has benefited from the general increase in wealth. Relative poverty (earning less than 50% of the median income in that country) is associated with social exclusion and vulnerability in the labour market. As a relative measure it is not necessarily about subsistence, and there are signs of a decline in the levels of "absolute poverty".

Increasing individualisation is a trend commonly identified as important in OECD countries, sometimes associated with the erosion of "social capital", with fewer people actively engaging in community and societal activities. The available data do not confirm this trend in many OECD countries – for instance, more people report belonging to sports or recreational clubs. Moreover, increasing numbers of people are interacting and participating in communities online, as illustrated by the explosive growth of *Facebook* and other social networking sites. Major questions remain, however, about what this means for the quality of social interaction.

General levels of life satisfaction tend to be increasing in OECD countries as reflected in high and growing self-reports of well-being across the OECD and the decreasing numbers of people committing suicide, but the modest increases of reported well-being over time suggest diminishing subjective returns to economic prosperity.

The changing world of work

Work plays a central part in society, the economy and the lives of individual people, and there is a shifting balance between private and working lives. In general, people in OECD countries spend less time in employment, start working later in life, retire earlier, work shorter hours and more often on a part-time basis. Still, with ICT enabling work to be taken home, longer commutes and (particularly for men) more time spent on household chores, less time in formal work does not necessarily translate in a linear way into greater leisure time. Another commonly-cited development is greater flexibility in the labour market, with people switching either voluntarily or involuntarily more often between jobs. Yet, care is needed not to exaggerate this trend: data presented in this book show

that in several OECD countries there are now more people who have been in the same job for more than ten years than there were twenty years ago.

It is not just the structure of the labour market that is changing but job content is changing, too. The economies of most countries in the OECD are increasingly knowledge-intensive. As transport prices have fallen and trade barriers lifted, a substantial share of the production of basic goods have been taken over by developing countries with lower wage costs. This drives OECD countries seeking to maintain their competitive edge towards the production of goods and services that require high levels of knowledge and skill, creativity and innovation. Growing investment in research and development, as well as the increasing numbers of researchers and higher education graduates across the OECD area, reflect this shift.

One of the most profound long-term trends in OECD societies in the last century has been the changing role of women. Women are much better qualified than in decades gone by and over the past 30 years have overtaken men in completion of upper secondary and tertiary education. The number of women active in the labour market has also gone up considerably, even though they are still more likely to work part-time and to earn less than men.

The transformation of childhood

The family model that came to be seen as dominant in the 20th century – characterised by a breadwinning father and a mother taking care of the household and a number of children – has never stopped changing. In the past fifty years, families have become smaller, parents are older, and, on average, more prosperous. At the same time, however, parents are more likely to both be active in the labour market as well, further increasing family resources but potentially reducing the amount of time available for children. Increasing numbers of divorces contribute to more complex family environments, and many children live with only one parent.

While families have generally become better-off and there is evidence of educational attainment of children being less dependent on parental attainment, the numbers of children in households characterised by relative child poverty have also gone up. So have the rates of obesity risen sharply and increasing numbers of children are being treated for mental and behavioural conditions such as Attention Deficit Hyperactivity Disorder (ADHD). The expectations adults have of children have intensified as well. Data from the World Values Survey shows that respondents find a whole range of qualities, ranging from hard work to imagination, increasingly important in children.

ICT: The next generation

In contrast with many of the trends in this book that are more gradual and sometimes linear in the direction of change, the pace of technological development is exponential and its influence often unpredictable. The focus in this book is on ICTs as being particularly relevant to education, rather than other forms of technological change that may be equally significant for countries and organisations.

Some of the most influential technological changes result from the linking of computers into a global network: the Internet. The availability and the use of computers at home have become almost universal in most OECD countries as has access to the Internet. More and more people use it on a daily basis to find information; communicate *via* email, audio or visual conferencing; make use of online services such as banking and shopping; and

take advantage of the massive amount of multi-media entertainment on offer. With the emergence of platforms built to enable user-generated content, Internet users increasingly interact, collaborate and create their own materials online. The growth in the availability of portable devices means that access to a computer and the Internet is no longer restricted to a location but is available almost everywhere.

The full potential of the expansion of information and communication technologies – from computers to mobile phones to user-generated content online – has yet to be unravelled and will continue to evolve. Most recently, with the combination of these technologies, increasing numbers of mobile phones have the ability to engage with *Twitter, Facebook* and other online applications. Recent global events have shown the potential for collaborative effort online. After the Haiti earthquake in early 2010, for instance, these technologies helped quickly to map the changing terrain and the locations of shelters through the collection and visualisation of crowd-sourced information from local people *via* portable devices and computers using SMS, *Twitter*, email and the web.

In conclusion

This section has summarised some of the major findings to emerge from this overview of trends, but it is meant only as an introduction; a simple narrative cannot do justice to such a complex set of developments. In each section, we discuss the issues raised for education, as well as some of the outstanding questions they give rise to for those in positions of responsibility within education systems. The wording "shaping education" is deliberate – these are developments in the wider context that impact in many ways on education, from provision aimed at young people to that for older adults. But it would be artificial to understand them as something apart from education. These trends are themselves shaped by education and manifest within it. They are intended to offer a valuable complement to the educational statistics and indicators that measure the developments taking place within education and training systems themselves.

HOW TO USE THIS RESOURCE

The future is inherently unpredictable. Yet, everyone – including policy makers and managers in education – needs to make plans that take the future into account. Looking at trends informs our ideas about what might happen through better understanding what is already changing in education's wider environment.

Using trends is not straightforward. Opinions differ on historical developments and, even when there is agreement, the future is rarely just a smooth continuation of past patterns. Moreover, we do not know in advance which will continue as in the recent past and which will change course.

"Stocks have reached what looks like a permanently high plateau" (Irving Fisher, Professor of Economics, Yale University, just before the 1929 Wall Street Crash).

Similarly, it is not guaranteed that the trends that were important in the past or seem so now will remain influential in the future; emerging trends, barely visible at the moment, may become of central importance in the future. For example, when aircraft were just beginning to become operational, the military leader who was to become Commander-in-Chief during World War I declared:

"Airplanes are interesting toys but of no military value" (Maréchal Ferdinand Foch, École Supérieure de Guerre).

Hence, bringing an awareness of trends to bear on our professional lives in education is not so much a science as a means of broadening our horizons and informing the base of decision-making. This book is a starting point for consideration about what is setting directions for the future. The following questions are intended to help draw out how the trends may be addressed and interpreted.

Is this trend relevant in my context?

Trends may differ both in size and direction in different countries, regions, districts or even schools. Ageing populations, for example, may be a bigger problem in rural than in urban areas or concentrated in certain parts of the county or districts in a city. International trends may have different impacts in different places: rising sea levels are potentially disastrous for Bangladesh but perhaps not for Nepal.

Are there other trends to take into account?

The trends in this resource are certainly not the only relevant ones, and not all of them apply equally in each location or context. There may be other, perhaps local, trends that will be just as important to consider. Different places face different challenges: some, for instance, are declining and de-populating while other areas even in the same country are booming and attracting new people. Each user will need to think of what are the important trends for their purpose.

How predictable is this trend?

Trends differ as to the predictability of their continuation. Some trends, for instance, to do with population growth or environment, lend themselves more easily to long-term planning. Others are less predictable, such as those to do with youth culture or international conflict. For these, devising scenarios of what would happen if a particular trend would develop in a certain way may well be more appropriate than extrapolation.

What is the pace of this trend?

Some trends develop slowly (global temperatures went up around 0.74˚C in the last 100 years) while other trends are more dynamic (the number of active *Facebook* users went up from zero to 400 million in six years). Slow trends allow more time to think about what they mean and how to respond but they may also be relatively impervious to change.

What is the impact of the trend?

Climate change may be slow but its potential impact is enormous, possible threatening life on our planet. Other trends like changing fashion are more short-lived, but have less impact on education. Generally, the more impact the trend has, the more important it is to anticipate it.

Can we anticipate this trend?

When trends are predictable, long-term planning is greatly facilitated. With fairly accurate demographic forecasts and as it is expected that all children should go into primary education, the capacity needed in primary education ten years from now under different assumptions about class sizes is open to calculation.

Can we influence this trend?

If trends are not predictable it may still be possible to influence them. Universities have great difficulty in predicting the number of students who will choose a certain study programme. However, they can attempt to influence the numbers of students applying through advertising campaigns.

Can we react to this trend?

If both predicting and influencing are impossible, creating the flexibility to be able to react after events occur may be the best option. For example, someone starting a business who does not know how it will take off is better advised to lease offices than buy them.

Finally

Above all, we hope that the different users to whom this report is targeted will ask the question: "what might this trend mean for my work?" better still, "how do these trends taken in combination redefine the context in which I am making decisions?" A large body of CERI work has been founded on the need for educational decision-making to be better informed by evidence, by awareness of what is taking place in other countries, and by the need to consider the bigger, long-term picture. This volume is squarely in that tradition.

Chapter 1

The dynamics of globalisation

Our crowded planet: *trends in and forecasts about global population levels, as well as the global trend of urbanisation.*

Populations on the move: *brings together trends on migration to and from OECD countries and the resulting growing share of those born in another country.*

Global environmental challenges: *examined through the long-term continuing rise in energy consumption and the accompanying emissions of carbon dioxide.*

International divides of affluence and poverty: *the widening divides between the richer and poorer regions of the world, as well as the world regional differences in declining child mortality.*

Towards a global economy: *the globalisation of economies as shown through growing trade and levels of foreign investment.*

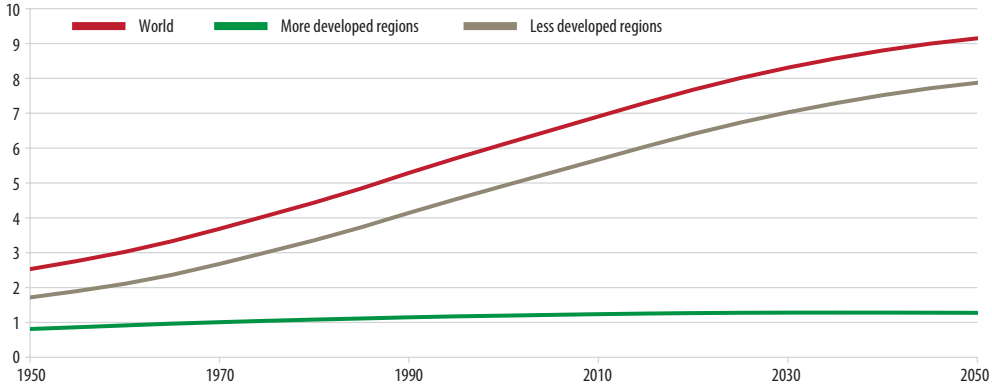
New global economic powers: *the emerging economic powers and the changing global landscape.*

OUR CROWDED PLANET

We live on a very crowded planet. More and more people are being born across the world, and many of us are living longer. At the same time, the world is seemingly getting smaller. The sense of distance separating countries and communities is shrinking, due to both the speed of international travel and advances in communication technologies. Also, increasing numbers of people are living in closer proximity to each other within urban environments. Although the world population is growing, that growth is not evenly spread, with the richer OECD countries experiencing ageing and low fertility rates (see Figures 2.1, 2.2 and 4.3). Education both shapes the beliefs and behaviours underpinning these demographic developments and is shaped by them, especially in terms of the availability of resources for educational purposes.

Figure 1.1. **Population stability in OECD countries, growth elsewhere**

Population growth worldwide and in more and less developed countries (in billions), 1950-2050



StatLink http://dx.doi.org/10.1787/888932320675

Note: More developed regions comprise all regions of Europe plus Northern America, Australia, New Zealand and Japan. Less developed regions comprise all regions of Africa, Asia (excluding Japan), Latin America and the Caribbean, plus Melanesia, Micronesia and Polynesia.

Source: United Nations Population Division (2009), World Urbanisation Prospects: The 2009 Revision.

There is a very wide, and growing, difference in population growth between the richer and poorer parts of the world. The relatively flat line at the bottom represents population numbers in more affluent countries, remaining largely constant after the baby boom of the 1950s and 1960s. This is in very marked contrast to less developed countries, where numbers have already grown enormously and look set to continue to do so. The world population more than doubled in the second half of the 20th century. Based on the estimates of United Nations demographers, the current world population of 6.9 billion is anticipated to grow to over 9 billion by 2050. If such forecasts materialise, the already severe pressures caused by the very different conditions of life in the richer and poorer parts of the world will become even stronger in years to come.

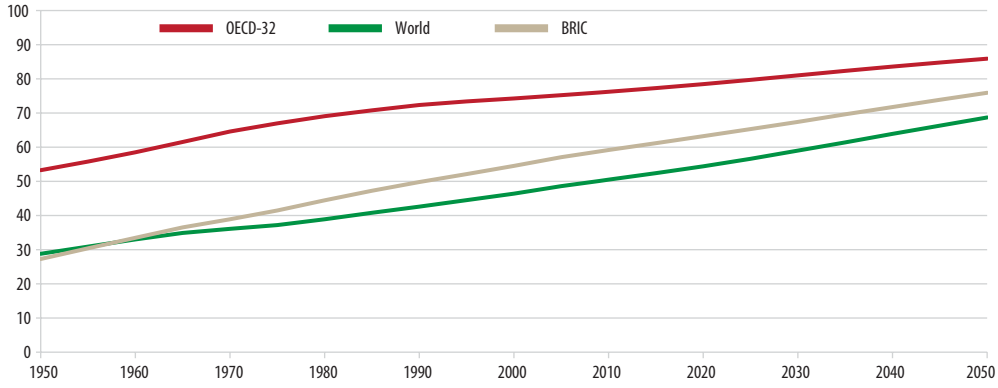
Changing economies and mobility mean that in both affluent and poor societies, there is a general shift of residence towards city and suburban environments. The

United Nations forecasts that over 85% of people in OECD countries and nearly 70% worldwide will be living in urban areas by 2050. (This estimate relies on national definitions of "urban".)

Towns and cities often enjoy opportunities unavailable in rural areas; job opportunities are, after all, the "pull" factor that makes so many decide to move. But urbanisation also means disruption to traditional ties and norms – progress in some circumstances, alienation and isolation in others – as well as creaking environmental, transport and housing infrastructures. In some OECD countries, this is leading to a partial revival of rural areas, as people embrace teleworking and look for alternatives to crowded town life.

Figure 1.2. **More people live in urban environments**

Percentage of people living in areas classified as "urban" by national authorities, 1950-2050



StatLink http://dx.doi.org/10.1787/888932320694

Note: The data labelled "BRIC" is an average of data from the emerging economies Brazil, the Russian Federation, India and China.

Source: United Nations Population Division (2009), *World Urbanisation Prospects: The 2009 Revision*.

And education?

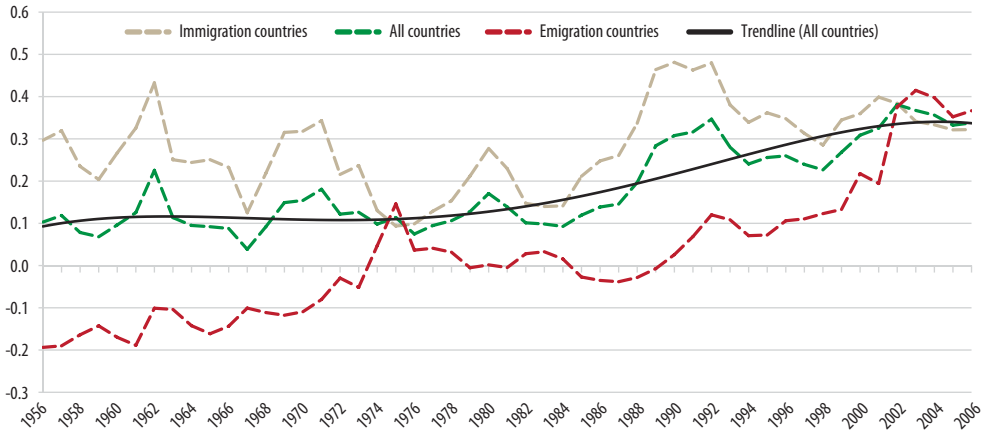
- Growing world populations have very clear resource implications. Are governments investing enough to reach the Millennium Goal of primary education for all, given that the world population is set to rise a further 3 billion up to the middle of the 21st century?
- Very rapid rates of urbanisation place services, including education, under strain. How can school, vocational and tertiary education cope with the problems of overcrowding and overstretched infrastructures in the urban areas affected?
- How can we deal with declining populations, loss of dynamism, and emptying schools in the countryside? How can we guarantee access to quality education services in emptying rural areas?

POPULATIONS ON THE MOVE

The movement of populations has been a feature of human life throughout history. In recent decades, it has become even more prevalent, particularly towards the more affluent OECD countries. The mobility of human resources is a significant contributing factor to the process of globalisation, while technological advances in communications and falling real international transport costs have in turn facilitated greater mobility. Skills are an integral element of the possibilities and patterns of migration. Immigration in general increases the cultural and linguistic diversity of the resident population which poses profound challenges for education, for some countries, in unprecedented ways.

Figure 1.3. **Increasing and converging migration rates**

Annual net migration rate (per 100 population) of traditional immigration and emigration
OECD countries, 1956-2006



StatLink http://dx.doi.org/10.1787/888932320713

Note: "Traditional immigration" countries are those that have had a relatively constant inflow of migrants throughout the second half of the 20th century. They include Australia, Austria, Belgium, Canada, France, Germany, Luxembourg, the Netherlands, New Zealand, Sweden, Switzerland, the United Kingdom and the United States. "Traditional emigration" countries are those whose populations tended to emigrate elsewhere throughout the second half of the 20th century. They include the Czech Republic, Denmark, Finland, Greece, Hungary, Iceland, Ireland, Italy, Japan, Norway, Poland, Portugal, the Slovak Republic and Spain.

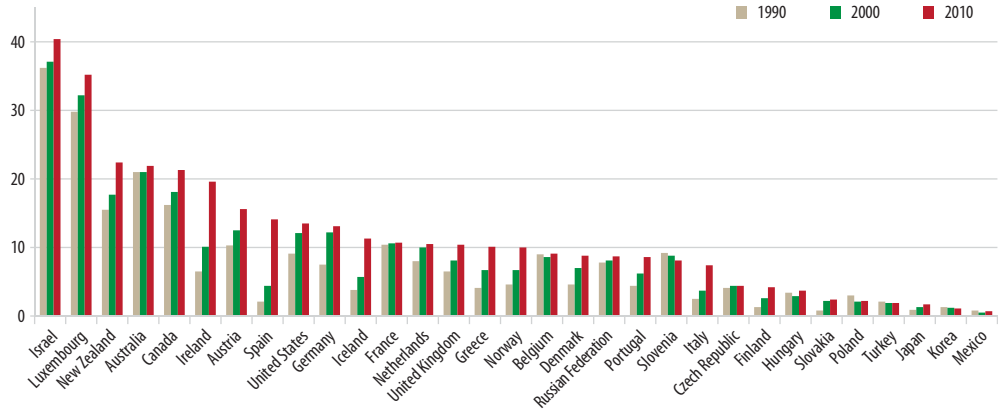
Source: OECD (2009), International Migration Outlook 2009.

Immigration to developed countries increased throughout the latter half of the 20th century. From the mid-1950s until the 1970s, migration occurred primarily within the OECD countries: from the "traditional emigration" countries to the "traditional immigration" countries. By the mid-1970s, these levels had converged and immigration has increased across the OECD area. By 2006, it had reached similar levels in both groups of countries. From the mid-1950s, the average for all OECD countries hovered around one immigrant per thousand population, before increasing significantly throughout the 1980s and 1990s and exceeding three per thousand by the turn of the century. Much of this general increase is attributable to the "traditional emigration" countries instead becoming destinations for immigration.

Immigration is a complex phenomenon. There is a strong "push" factor from populations looking to improve prospects or escape poverty by moving to one of the world's rich nations. There is also a "pull" factor, whether from governments looking to revitalise their own ageing societies or by major companies in search of the highly skilled. The recent net immigration has lead to growing and substantial proportions of foreign-born people living in OECD societies. In 2008, the United Nations estimated that by 2010 migrants would account for between 10% and 40% of the population in 16 of the OECD countries shown. Even in countries that traditionally have not been immigration destinations, the trend illustrated below moves clearly upwards, most markedly in Greece, Iceland, Ireland, New Zealand and Spain. For education, this translates directly into increasing diversity within school and student populations, raising quite new challenges for many education systems.

Figure 1.4. **Increasing numbers of "foreign-born"**

Stock of international migrants as a percentage of the total population, 1990, 2000 and 2010



StatLink http://dx.doi.org/10.1787/888932320732

Note: International migrants are defined as individuals whose country of birth is not that in which they reside.

Source: United Nations Population Division (2008), *International Migrant Stock: The 2008 Revision*.

And education?

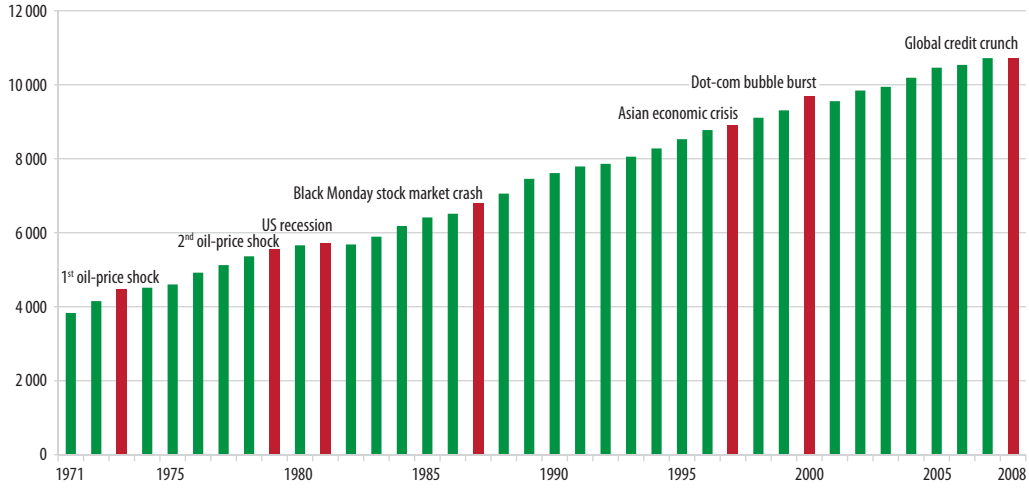
- In increasingly diverse societies, educators at all levels face an even greater range of expectations and aspirations from students and their families. How far should these differences be accommodated? Are educators equipped to incorporate this diversity?
- Newly migrated families are among those most likely to face precariousness and exclusion. Are educators equipped to deal with the inequality of educational opportunity that greater numbers of immigrants may cause?
- Immigration means that, throughout their lives, students will be confronted with culturally diverse environments, either within formal education or elsewhere. What do they need to learn to deal with this?

GLOBAL ENVIRONMENTAL CHALLENGES

The environment in which we live is an obvious and critical part of the wider context of education. The changes taking place in that environment impact in innumerable ways on the objectives of education and the beliefs and ambitions of learners. In this volume, we look at these challenges through two trends: growing electricity consumption and rising carbon dioxide emissions. Human capital growth and affluence have brought improvements in living conditions in OECD countries, but have relied upon consumption and production patterns associated with global environmental problems. Education plays a key role in shaping the attitudes and knowledge that can make a difference.

Figure 1.5. **Growing production and consumption of electricity**

Gross electricity production (TWh), 1971-2008



StatLink http://dx.doi.org/10.1787/888932320751

Source: OECD (2009), *OECD.Stat: Electricity and Heat Generation.*

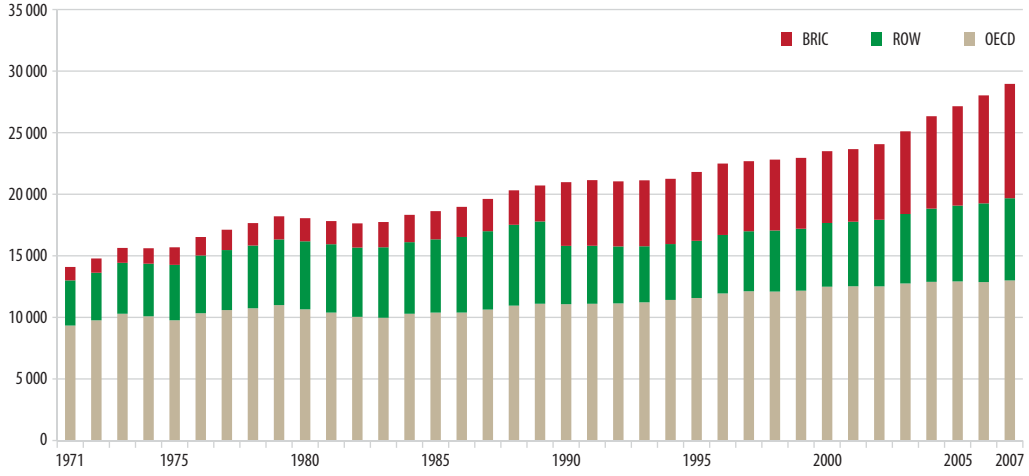
There has been a dramatic increase in energy use in recent decades. World electricity consumption nearly tripled from 1971 to 2008, and is projected to rise a further 40% to 2030. Electricity consumption tracks economic growth, but in times of economic slowdown, growth in energy use on the above measure tends only to slow rather than decline. Prosperity seems to have brought an insatiable appetite to consume more energy, raising critical questions of sustainability in terms of both the availability of limited resources for a growing population and the environment itself. Climate change is a current and significant threat to the environment and is manifest in different ways. These include increasing temperatures particularly in the Polar regions, rising sea levels, greater prevalence of extreme weather events, changing ocean chemistry, reduced species diversity, and numerous impacts on human health.

The emission of greenhouse gases, such as carbon dioxide, is an important element in these environmental changes. Carbon dioxide emissions worldwide have steadily

increased since 1971 to more than double by 2007. OECD countries accounted for almost 45% of these emissions. The greatest increase occurred in the so-called BRIC countries (Brazil, the Russian Federation, India and China). As a result of the reliance on fossil fuel combustion, electricity production is the largest single contributor to carbon dioxide emissions. In 2007, fossil fuels accounted for over 80% of world energy demand and current forecasts expect this to remain at similar levels for the coming 20 years. This growth will primarily reside in rapidly growing emerging economies.

Figure 1.6. **Growing carbon dioxide emissions**

CO_2 emissions from fuel combustion (million tonnes), 1971-2007



StatLink http://dx.doi.org/10.1787/888932320770

Note: The BRIC grouping of countries includes Brazil, the Russian Federation, India and China. OECD in this case refers to the first 30 member countries and ROW stands for the rest of the world.

Source: OECD (2010), *OECD Factbook 2010: Economic, Environmental and Social Statistics.*

And education?

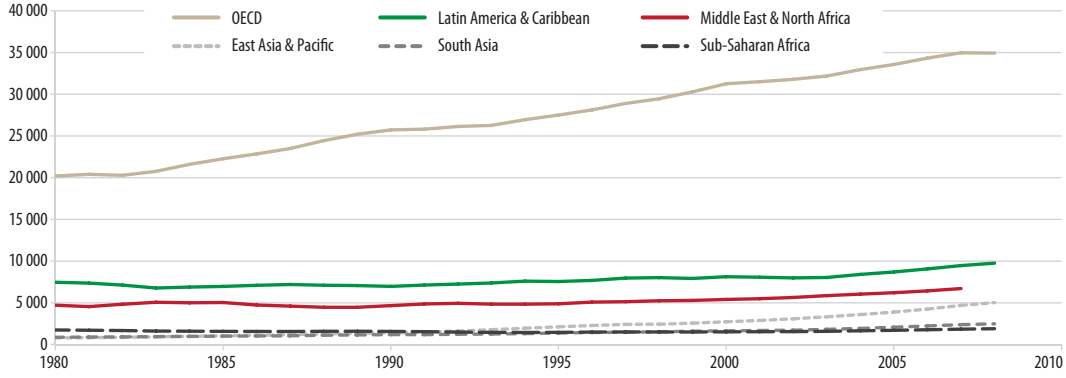
- What is the role of formal education in creating responsible citizens, with civic values, critical skills and sustainable consumption habits? What roles should education play in shaping the knowledge, attitudes and behaviour which both underpin the environmental issues discussed in this section and contribute to their solution?
- Environmental challenges are fundamentally global in nature. How can education foster the necessary attributes for the kind of international cooperation required to deal with them?
- What kinds of tertiary and post-secondary training might provide the skills and expertise needed for a green economy?

INTERNATIONAL DIVIDES OF AFFLUENCE AND POVERTY

Global inequality has increased substantially over the past three decades, as affluence has grown in OECD countries. Rapid growth rates in some more recently developed economies notwithstanding, the income gap between the average citizen in the richest and the poorest countries is very wide and growing. Child mortality provides a direct indication of a compound of disadvantages and, while rates are improving in all regions, some still lag significantly behind. Education and training are key contributors to both economic growth and social improvement, but the countries most in need of their benefits tend to be those least able to invest. Indeed, increasing investment in education in affluent countries is one factor exacerbating global inequality.

Figure 1.7. **The widening gap between richer and poorer regions**

GDP per capita by region, 1980-2008



StatLink http://dx.doi.org/10.1787/888932320789

Note: GDP per capita is presented in purchasing power parity constant 2005 international dollars.

Source: World Bank (2010), *World Databank: World Development Indicators & Global Development Finance Database*.

During the past thirty years, the already-wide regional gap in affluence between the developed countries of the OECD and the rest of the world has grown still wider. The OECD countries have enjoyed increasing prosperity, amounting to almost USD 15 000 more per person in 2008 compared to 1980. Latin America, after faltering in the 1980s, recovered to maintain its second place. However, following the OECD area, the second largest increase in per person prosperity took place in East Asia and the Pacific, growing just over USD 4 000 per person converging towards the Middle East. Meanwhile, the poorest regions of South Asia and Sub-Saharan Africa have showed very flat trajectories along the bottom of the chart throughout the past three decades, with average prosperity per person growing only USD 150 during this period.

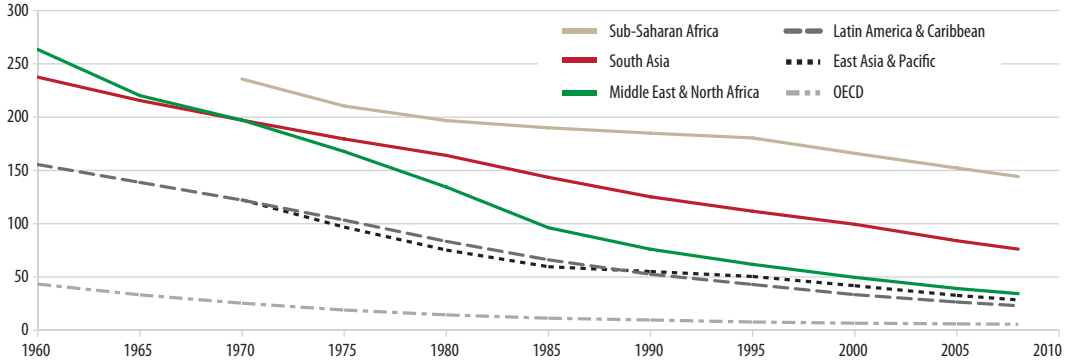
Child mortality is a key indicator, not just of child health but of overall development: its reduction by two-thirds from 2000 to 2015 is the fourth of the eight internationally-agreed Millennium Development Goals. Over the past 40 to 50 years, some enormous strides have been made to address child mortality, nowhere more so than in the

Middle East and North Africa where rates fell from nearly 265 deaths of young children per 1 000 of the population to less than 35 by 2008. Yet, despite improvement, stark inequalities remain. In 2008, the rate of child mortality reached as low as 0.5% on average within the OECD. In contrast, countries in Sub-Saharan Africa on average still experience child mortality rates of almost 15%.

International inequality is a thread running through many global problems, such as environmental degradation, disease transmission and political instability. Differential access to quality learning opportunities is both a reflection and a cause of such inequalities. Prosperity makes resources available to spend on teachers and facilities that remain far beyond the reach of many countries.

Figure 1.8. **Child mortality going down but differences remain wide**

Mortality rate of children under 5 years old (per 1 000), 1980-2008



StatLink http://dx.doi.org/10.1787/888932320808

Source: World Bank (2010), *World Databank: World Development Indicators & Global Development Finance Database*.

And education?

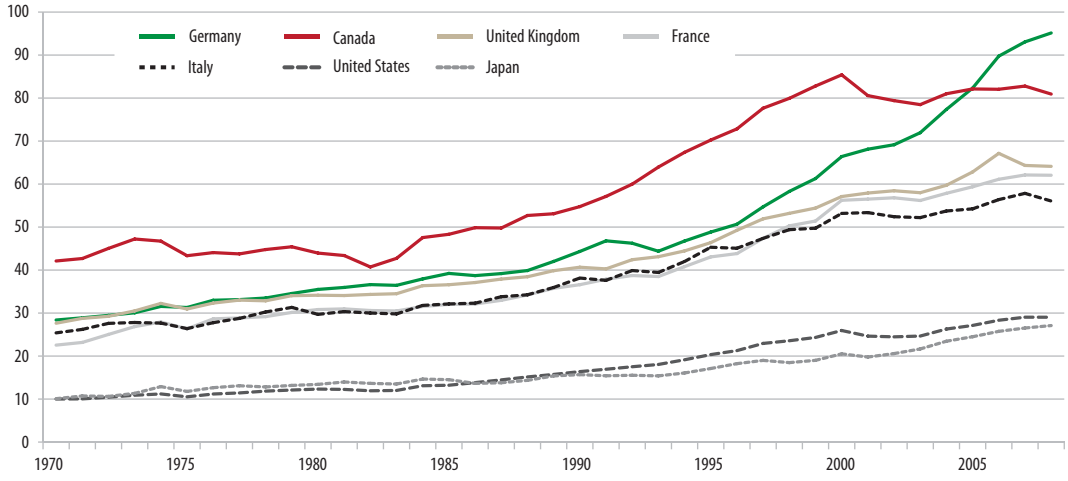
- Improving education enhances a country's economic competitive edge. Do the economic returns from national investment in education inevitably increase global inequalities?
- For the less developed regions, education plays a key role in their economic and social development, but how can education be realised under conditions of (extreme) poverty?
- How aware are students in OECD countries of the bigger global problems illustrated by these figures and should they know more about the situation worldwide?

TOWARDS A GLOBAL ECONOMY

In the process of globalisation, national economies are both internationalising and integrating with each other, assisted by technological advances, cheaper transport and the lowering of trade restrictions. As more firms become global or multinational, there is increasing diversity in the size and origin of those operating in the international arena. Goods and capital are more readily transferred in real time across national borders. At the same time, recent events pose questions about the stability of global economic arrangements and about the role and influence of national governments. Education is affected by major shifts in the global economy, and attention to international economic developments may have increased the interest in educational comparisons. At the same time, education helps to shape the attitudes and expertise that drive international trade and collaboration.

Figure 1.9. **Growing importance of international trade**

Total trade to GDP ratio for G7 countries, 1970-2009



StatLink http://dx.doi.org/10.1787/888932320827

Source: OECD (2009), *OECD.Stat: Macro Trade Indicators*.

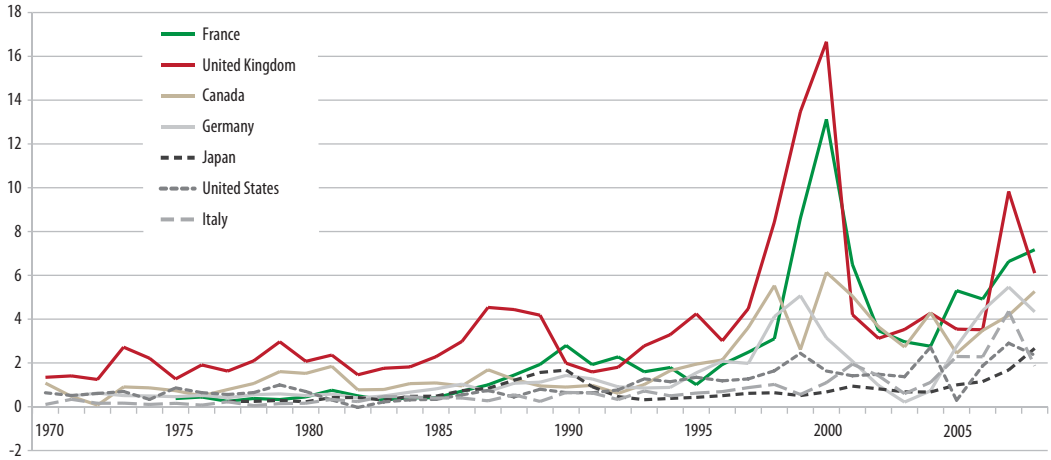
A key measure of a country's "openness" or "integration" in the world economy is the ratio of trade (the sum of exports and imports) to GDP. This ratio represents the importance of trade in the economy of each country. It should be remembered that a low ratio may be due to economic size and geographic remoteness from potential trading partners, rather than reluctance to trade. Among the economies of the G7, the highest ratios are found in Canada, Germany and the United Kingdom, and the lowest in Japan and the United States. Since 1970, this ratio almost doubled in all G7 countries, increasing nearly three times in Germany. This upward trend has been continuing at a steady rate, despite several economic ups and downs, although the full effects of the current financial crisis are yet to be seen.

Foreign direct investment (FDI) is a key aspect of global economic integration because it creates direct links between economies, encouraging the transfer of technology and intellectual capital between countries. Figure 1.10 charts FDI as a proportion of GDP. The

graph underlines the turbulence of foreign investment, especially after 1995, with steep peaks and troughs accompanying the "dot com" and global financial crises, reflecting the increased speculative nature of FDI. This volatility notwithstanding, there has clearly been a real increase: even at its lowest point in 2002 after the "dot com" crisis it was almost 70% higher in the United States, and more than nine times higher in France and Italy, than at the beginning of the 1970s. Since 2002 the ratio has gone up in all G7 countries although data on the impact of the global financial crisis is still unavailable.

Figure 1.10. **Leading economies investing more globally**

Outflow of Foreign Direct Investment (FDI) as a percentage of GDP in G7 countries, 1970-2008



StatLink http://dx.doi.org/10.1787/888932320846

Source: World Bank (2010), *World Databank: World Development Indicators & Global Development Finance Database*.

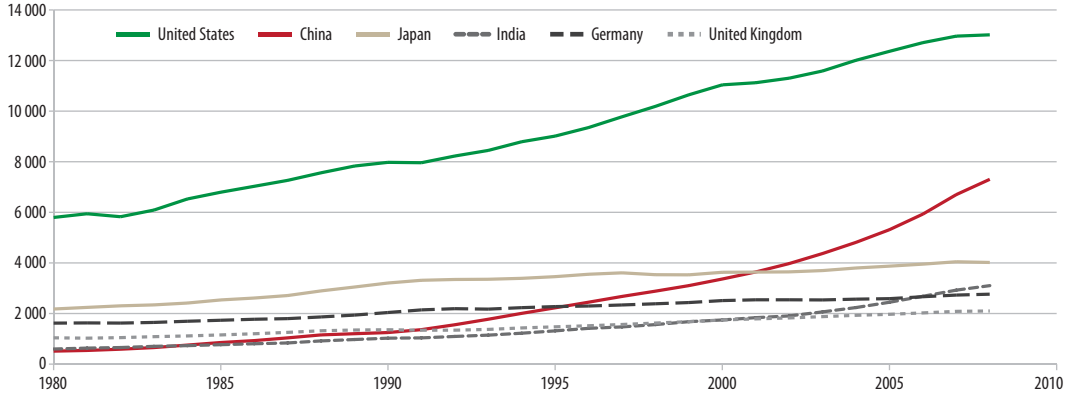
And education?

- Increasing competition on global markets has promoted the widespread belief that countries need constant innovation to maintain position. Does education nurture the creativity necessary to be innovative?
- Education and training systems have traditionally been strong bastions of national decision-making. Do these systems provide students with the necessary outlook and skills, including language skills, for successful international co-operation?
- Attracting foreign direct investment is an important national economic growth strategy. To what extent does high quality education help to attract multinationals looking for a skilled labour force?

NEW GLOBAL ECONOMIC POWERS

The global economic balance and scene are changing. New economic powers like China and India are now very prominent, which, together with Brazil, Russia and South Africa, are referred to as "BRICS". Countries that were previously labelled as "developing" have become of key importance for the world economy, as reflected in the rise of the G20 summit as a forum for international economic co-operation. This is not just a matter of new countries catching up with others, but of transformations in the balance of economic power and finance that affect all. For education, this process alters the context of underlying beliefs about work, jobs and cultures that may take years to filter into classroom thinking. It directly affects the international learning market and research.

Figure 1.11. **China and India catching up**
Size of GDP of the world's six largest economies, 1980-2008



StatLink http://dx.doi.org/10.1787/888932320865

Note: GDP is presented in billions of purchasing power parity constant 2005 international dollars.

Source: World Bank (2010), *World Databank: World Development Indicators & Global Development Finance Database*.

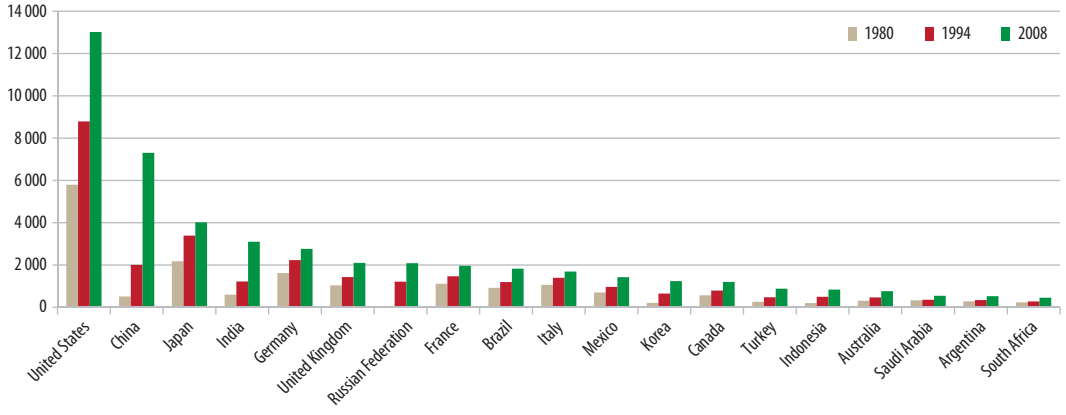
The shifting balance of economic strength is well-illustrated by the rise of the economies of China and India. The figure is based on comparisons of the gross domestic product (GDP) of major world economies, corrected for purchasing power parity (PPP). The United States is still well out in front as the leading world economy, but China is now clearly in second place, with India also moving ahead on this measure. The figure highlights the speed of change, with the most rapid economic development in China and India occurring since 1990. The enormous populations of these countries partly account for the size of their economies. Moreover, the correction for purchasing power increases the relative size of these economies further because an international dollar still buys a lot more in China and India than in the other countries in the figure. Nevertheless, Figure 1.11 clearly illustrates the shifting of global economic power.

This changing balance is not restricted to the very large economies of China and India. Figure 1.12 shows the growing size of the G20 economies, which include a mix of both established and emerging economic powers. All have experienced economic

growth, especially since the 1990s. However, large differences in the relative size of the G20 economies remain, with the largest – the United States – almost 30 times bigger than South Africa, the smallest in the figure. The influence of new powers in the global economy is changing the geo-political landscape. Hundreds of millions of working-age adults will become available for employment in what is evolving into a more integrated world labour market. The nature of work available in established OECD countries is already profoundly affected by these trends, and this can only be expected to continue. Especially in the Western economies, the heightened competition has driven the policy debates about the need for education and research to strengthen the knowledge economy and foster the innovation to maintain competitiveness, despite comparatively high wages.

Figure 1.12. **Thirty years of economic expansion**

Size of GDP in 19 of the G20 members, excluding the EU, in 1980, 1994 and 2008



StatLink http://dx.doi.org/10.1787/888932320884

Note: GDP is presented in billions of purchasing power parity constant 2005 international dollars.

Source: World Bank (2010), *World Databank: World Development Indicators & Global Development Finance Database*.

And education?

- Does the changing global landscape argue for change in the curricula of OECD countries, whether for science, language learning or other subjects such as history and geography? Can schools help their students to develop greater cultural sensitivity?
- Should these economic shifts contribute to fundamental rethinking of the nature of schooling, vocational education, tertiary education and lifelong learning and innovation policies?
- Certain new economic powers are rapidly increasing numbers of tertiary graduates, particularly in the sciences, mathematics and engineering. What are the consequences for national economies and the higher education sector in OECD countries?

FIND OUT MORE

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The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Definitions and measurement

- *Population projections*: United Nations projections of future national population size are derived from the most recent data on population size, taking into account past fertility, mortality and international migration.
- *Urban population*: Essentially, populations living in urban areas. It is important to note that this data from the United Nations relies on national classification of urban areas in each country.
- *Gross electricity production*: The production of electricity is measured at the point of production and quantified in gigawatt hours (GWh). The amount includes the energy used by station auxiliaries in the process of production and energy lost in transmission of electricity to consumers.
- *Carbon dioxide emissions*: Carbon dioxide is a gas emitted from the combustion of organic matter. The greatest source of emissions is from the burning of fuels, including coal, oil and gas. This component of emissions is all that is included in the data shown. Of all greenhouse gases (those contributing to global warming), humans produced carbon dioxide the most.
- *Gross Domestic Product (GDP)*: The standard measure of the value of the goods and services produced by a country during a period. *Gross* means that no deduction has been made for the depreciation of machinery, buildings and other capital products used in production. *Domestic* means that it is production by the residents of the country. As many products produced in a country are used to produce other products, GDP is calculated by summing the value added for each product.
- *GDP per capita*: The GDP of a country divided by its total population. GDP per capita is generally used as a proxy for economic living standards, although technically this is not what GDP measures.
- *Purchasing Power Parities (PPP)*: This refers to the rate of currency conversion which eliminates differences in price levels among countries and makes international comparison possible. For example, normally one dollar in China buys more than one dollar in France. However, after conversion to PPP rates, this dollar will buy the same basket of goods and services in both countries.
- *Mortality rate, under-5-year old (per 1000)*: Under-five mortality rate is the probability per 1000 that a newborn baby will die before reaching age five, if subject to current age-specific mortality rates. Child mortality is a useful indicator and is often used as a proxy for the general health of national or regional populations.
- *Trade to GDP ratio*: This ratio is an indicator of a country's integration into the world economy, that is, how dependent producers within the country are on foreign markets and how much the supply of goods and services from overseas dictates national demand. It is calculated by dividing the sum of exports and imports to a country by its national GDP.

- *Foreign Direct Investment (FDI)*: FDI refers to the net inflow of investment from people in one country into an enterprise operating in another country's economy. To be included, the amount must exceed 10% of the voting stock, indicating a management interest over time.
- *The G20*: The Group of Twenty, or G20, is a group of both finance ministers and central bank governors from twenty key economies, including 19 countries (Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the United Kingdom and the United States) and the European Union. The G20 meetings are generally held twice each year and also attended by the President of the World Bank, the Chairman and Managing Director and Finance Committee of the International Monetary Fund, and the Chairman of the Development Committee.

Chapter 2

New social challenges

***Changing age structures**: trends and forecast of changing age structures with smaller numbers of children and growing numbers of older people, and the ratios of working age to retirement-age populations.*

***Changing patterns of social expenditure**: compares the changing shares of national income devoted to health and educational expenditures in different countries.*

***Inequality on the rise**: presents OECD trends using Gini coefficients and the decomposition of general trends into the fortunes of the better and worse off.*

***The persistence of poverty**: focuses especially on numbers of those who are least well off in OECD societies.*

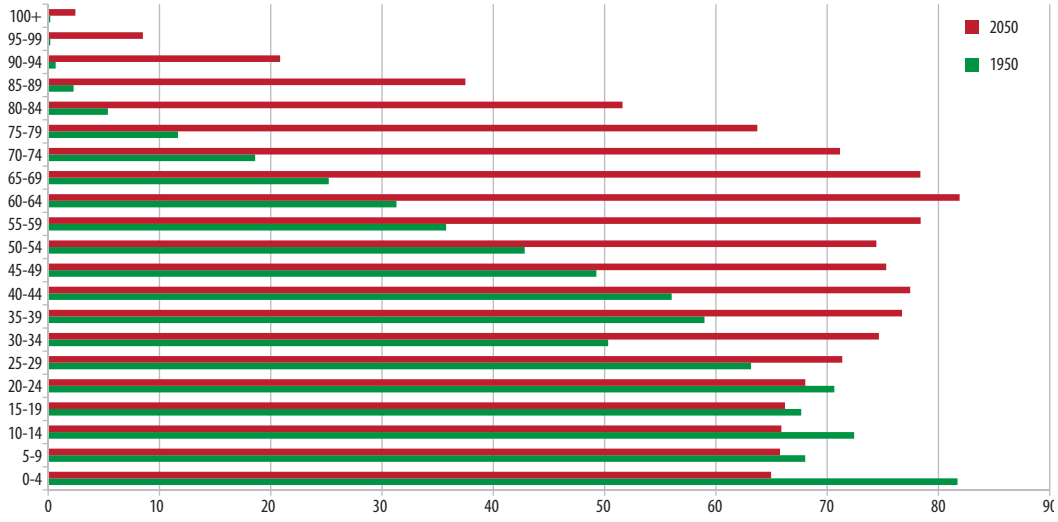
***New forms of community engagement**: this section examines international data on participation in voluntary organisations and in online communities.*

***More satisfied with life**: examining life satisfaction through the different lenses of subjective reports of happiness in different countries and trends in suicide rates.*

CHANGING AGE STRUCTURES

The combined effect of living longer and having fewer children is transforming population structures. Over the last 50 years, the essentially pyramidal age structure of economically developed populations has transformed into a "top heavy" shape with a narrower base and a bulging middle moving steadily up. "Dependency ratios" compare the size of the age groups often characterised by financial independence with those who may well be dependent, such as children or the elderly. Considerable increases in the ratio of those aged 65+ years, in comparison to the working population of 15-64 year-olds, are expected over the next 40 years to 2050. This has potentially far-reaching consequences for both the resources available for education and for the future lives of the young.

Figure 2.1. **From "bottom-heavy" to "top-heavy" age structures**
Age structure in more developed regions (in millions of people per age bracket), 1950 and 2050



StatLink http://dx.doi.org/10.1787/888932320903

Note: "More developed regions" refers to Europe, plus Northern America, Australia, New Zealand and Japan.

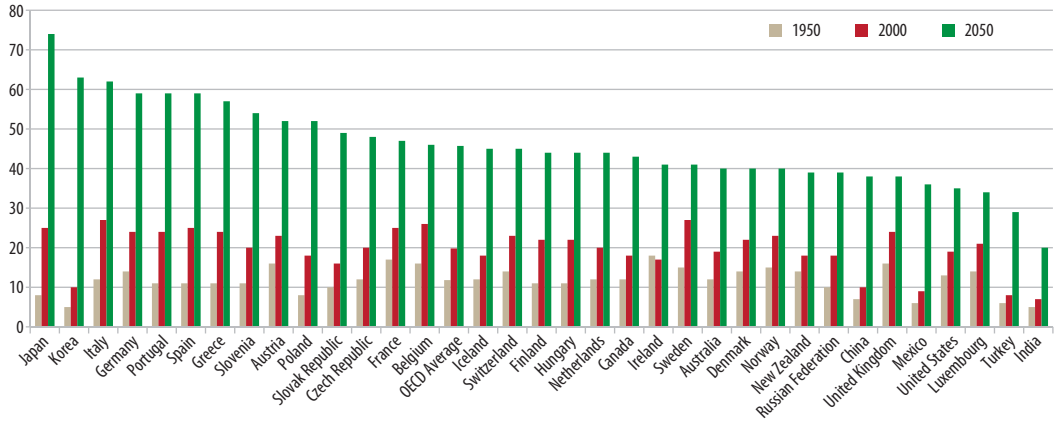
Source: United Nations Population Division (2008), *World Population Prospects: The 2008 Revision*.

Numbers of children have decreased throughout OECD countries since 1950. During this time, the numbers of people in older age groups have increased considerably, primarily as a result of greater life expectancy attributable to improvements in hygiene, living conditions and preventative healthcare. Given current patterns in fertility, mortality and international migration, this trend is expected to continue, such that by 2050 there will be more people aged 70-74 years than in any of the five-year age bands below 30, and there will even be around as many 75-79 year-olds as there are children less than 5 years of age.

Another measure of ageing populations is the "old age dependency ratio", which compares the proportion of the population over 65 years with those of working age (15-64 years). This ratio is an indicator, though not an exact measure, of the number of elderly financially dependent people compared to the potential working population. In

OECD countries on average, this ratio increased from 12% to 20% during the second half of the 20th century. This is expected to continue to 2050, doubling again to 46%. Although this trend is consistent in all OECD countries, its magnitude differs. The share of older to younger adults is expected to be especially high in Japan, Korea and Italy, where it is predicted to reach almost three in the 65+ bracket for every four 15-64 year-olds. In contrast, in India the "old-age dependency" ratio is expected to reach only 20, that is, one person aged 65+ years per five of working age. Turkey is the only OECD country illustrated below where this ratio is expected to stay below 30.

Figure 2.2. **The "old-age dependency ratio" set to double by 2050**
Population aged 65 years and over per 100 persons aged 15-64 years, 1950, 2000 and 2050



StatLink http://dx.doi.org/10.1787/888932320922

Source: United Nations Population Division (2008), *World Population Prospects: The 2008 Revision*.

And education?

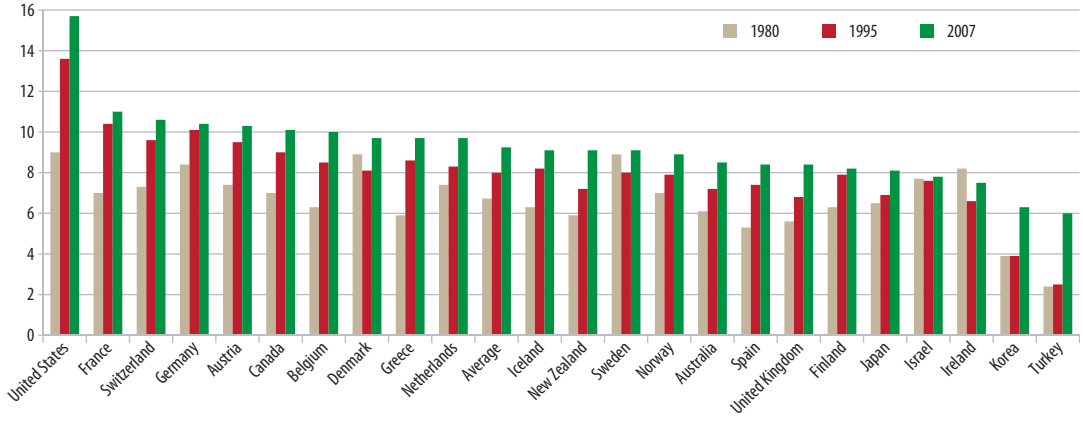
- The smaller age groups leaving education and entering the labour market will not replace the retiring baby-boom generation. Can we continue with ever-lengthening periods of time spent by young people in initial education? Do we need more flexible, less linear models?
- Many older people will be mentally and physically active for much longer. What role should the education system play in meeting the learning and cultural needs of the many older members of the population?
- The education workforce at all levels is ageing in line with the general population. How can we attract and retain sufficient numbers of teachers and academics?

CHANGING PATTERNS OF SOCIAL EXPENDITURE

The ageing of populations has profound effects on health and pension expenditure in OECD countries. One of the great policy challenges is how to deal with these increased expenditures which remain largely covered by the public purse in many countries. This section compares recent trends in health and education, noting different patterns and trajectories. While the newly-retired generation is richer and healthier compared to previous generations and most countries are considering mechanisms limiting health and pension costs, serious questions remain about the sustainability of present day budgets. How will rising costs associated particularly with the baby boom generation now moving into retirement affect budget available in other important areas? Will this be a struggle between the retired and the studying generations for sufficient funding?

Figure 2.3. **Rising health expenditure**

Total expenditure on health as a percentage of GDP, in 1980, 1995 and 2007



StatLink http://dx.doi.org/10.1787/888932320941

Source: OECD (2009), *OECD.Stat: Health Data*.

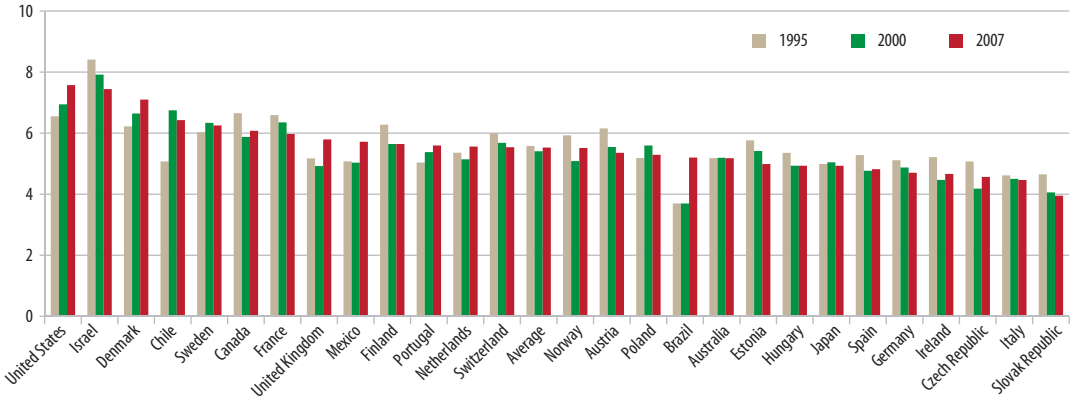
The pattern emerging from this figure is very clear. In 2007, OECD countries were spending more of their national wealth on health than they were in 1980, in some cases by a sizeable amount. Only in Ireland was the proportion of national resources devoted to health lower in 2007 than at the beginning of the 1980s (and of course GDP itself rose very substantially during this time). The levels themselves are also high, with an average health expenditure in the 23 OECD countries of more than 9% of GDP in 2007, up from 8% in 1995, much higher than the 6.7% of GDP spent in 1980. Behind the averages are substantial differences between countries. The United States is clearly ahead, spending almost 16%, which is 5% more than the second largest spender, France. The countries spending the least of their national income on health are Korea (6.3%) and Turkey (6.0%), though in each case this has been rising sharply.

Educational expenditure as a proportion of national wealth is characterised by a notably different set of patterns. The average across the 27 countries stood at 5.5% of GDP in 2007, up from 5.4% in 2000, but slightly lower than 5.6% in 1995. Beyond the

averages, 17 countries are spending less of national wealth on education in 2007 than in 1995. There are important differences between education and health expenditures, of course, especially in the extent to which educational provision is much more closely tied to specific population groups (the young) whose numbers have been falling. In fact, per student spending at the school level has gone up in the countries covered by OECD data by 43% between 1995 and 2007, as has per student spending in tertiary education in the majority of countries. Nevertheless, the contrast between health and education suggests how intense the competition for funding, already high, may yet become.

Figure 2.4. **Education spending: No clear trend**

Expenditure on educational institutions at all levels as a percentage of GDP, in 1995, 2000 and 2007



StatLink http://dx.doi.org/10.1787/888932320960

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

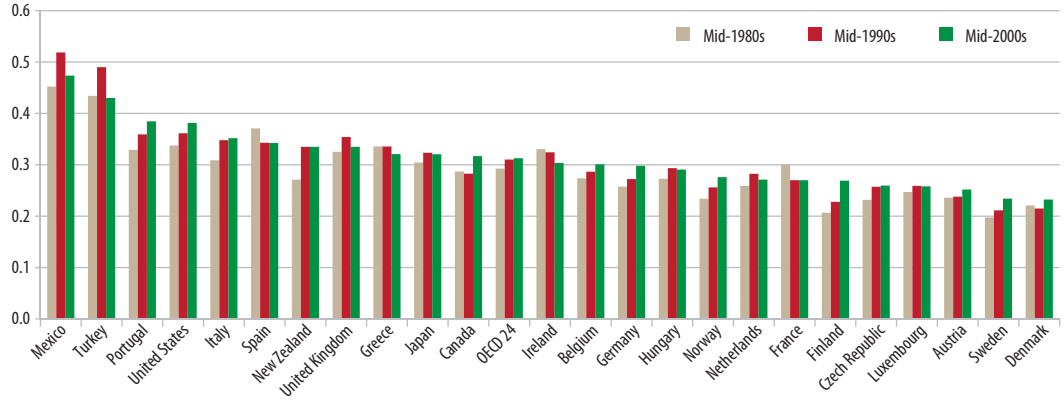
And education?

- How far might continuing increases in health and pension spending in the future squeeze out education in which per student spending has so far held up strongly?
- Can increasing private expenditure on education, health and pensions cover the rising costs? What room is there for greater private expenditure specifically in education?
- Are there areas of current educational expenditure that might offer savings without damaging learning opportunities? To what extent can innovation at any level of the education system contribute to the more efficient use of resources?

INEQUALITY ON THE RISE

Income inequality has been increasing on average in OECD countries in the last 20 years though countries differ markedly in the extent of inequality experienced. OECD data also enables the analysis of income developments for different income group. It shows that in most OECD countries, all income groups (the top 20%, the middle income group and the bottom 20%) prospered, but they did so at different rates. In only two countries did the rich get richer while the poor got (slightly) poorer. Education is an integral part of the complexity of inequality – both helping to select among unequal life-chances, on the one hand, while seeking to redress inequalities, on the other. There is also the question of how genuinely open are certain desirable educational options to the least well-off.

Figure 2.5. **Income inequality tending to grow**
Gini Coefficients for OECD countries, in the mid-1980s, mid-1990s and mid-2000s



StatLink http://dx.doi.org/10.1787/888932320979

Note: The Gini Coefficient is an indicator of income inequality, where the higher the number, the greater the inequality.

Source: OECD (2009), *Society at a Glance 2009: OECD Social Indicators*.

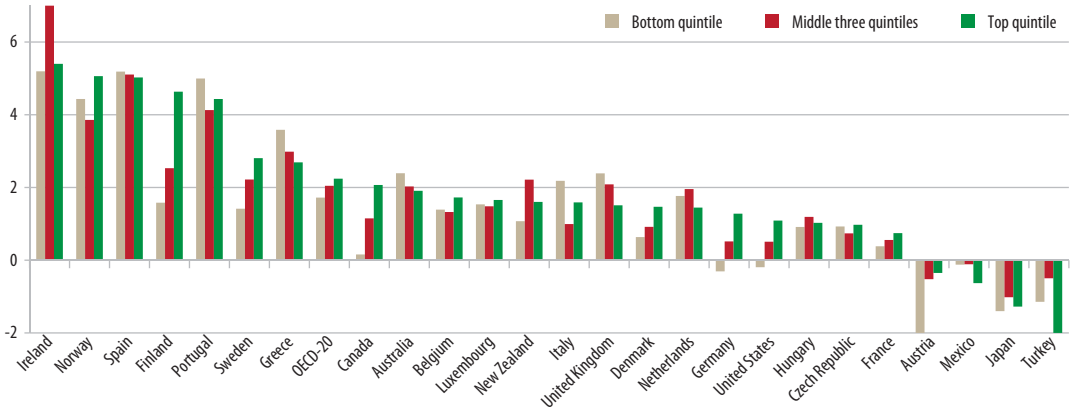
There was growing income inequality in most OECD countries since the mid-1980s up to the mid 2000s. Not all shared this general tendency: France, Greece, Ireland and Spain moved instead in the direction of greater equality. There are very wide differences between OECD countries on this indicator, with relatively high levels of inequality in Mexico, Portugal, Turkey, and the United States, and low levels in Denmark and Sweden. Some countries experienced uneven developments with their highest or lowest inequality reading over the three time points in the middle reference year of the mid-1990s (very marked in the case of the two countries with the highest inequality in Figure 2.5, Mexico and Turkey). Trends up the mid-2000s take no account, of course, of any impact that the recent crisis may have had on inequality.

Figure 2.6 looks in more detail at the composition of the overall trends in terms of what happened to the most well-off households, the large middle group, and the bottom fifth of households over the period from the mid-1990s to the mid-2000s. The OECD

average shows the top, middle and bottom income groups all experiencing rising income over the decade – the top group more than the middle and they more than the bottom. But there was a variety of patterns in different countries behind the overall averages. For almost all countries all the income groups benefited from rising incomes over the decade to the mid-2000s, except for Austria, Germany, Japan, Mexico, Turkey and the United States. In general rising overall inequality does not mean that the rich are getting richer and the poor are getting poorer. Only in Germany and the United States does this description hold, with lower incomes for the lowest income group alongside the growing incomes of the highest income group.

Figure 2.6. **Income gaps widening**

Average annual change in real household income by quintiles, from the mid-1990s to the mid-2000s



StatLink http://dx.doi.org/10.1787/888932320998

Source: OECD (2008), *Growing Unequal? Income Distribution and Poverty in OECD Countries*.

And education?

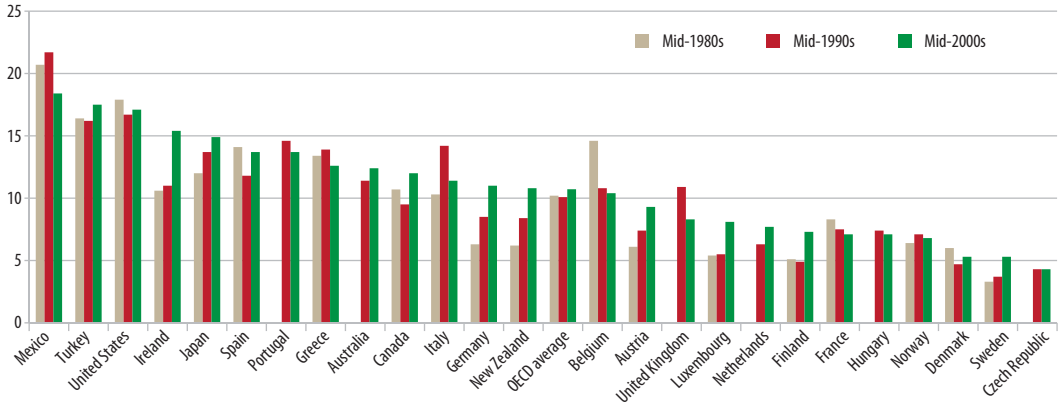
- Education can stimulate social mobility by providing opportunities, but it also plays a role in reproducing inequalities when the already-privileged have better access to education. Can education be designed in such a way that it does not reinforce inequalities?
- Do greater school choice and more personalised learning inevitably favour those with the greater cultural resources? How can we balance equity with the legitimate rights of parents to choose what is best for their child?
- The take-up of adult learning opportunities is closely related to initial levels of educational attainment, thereby reinforcing inequalities. What can be done to make tertiary and adult education more equal?

THE PERSISTENCE OF POVERTY

The focus on inequality needs to be complemented by one on those at the bottom end of the distribution whose prospects are poorest and who are most vulnerable in socio-economic terms. Measures of both "relative" and "absolute" poverty show wide differences between countries in the numbers of people considered poor. There is some tendency for the scale of relative poverty to go up, but levels of absolute poverty seem to have generally gone down. Both perspectives are important for the whole picture – although the poor have not shared equally in the growing prosperity of most OECD countries, more are now better off in absolute terms. Poverty is important for education, in part because of the evidence of the impact of socio-economic background on educational outcomes, and in part because of the role of human capital and qualifications in determining individual prospects.

Figure 2.7. **Relative poverty increasing**

Percentage of people with an income less than 50% of the median income, in the mid-1980s, mid-1990s and mid-2000s



StatLink http://dx.doi.org/10.1787/888932321017

Source: OECD (2008), *OECD.Stat: Income Distribution and Poverty.*

Levels of "relative poverty" show the proportion of people earning less than half the median – or mid-point – income level in a particular country. While on average the level has increased over the past two decades, significant variation exists among OECD countries. In the mid-2000s, more than 15% of the population earned less than half the median income in Ireland, Mexico, Turkey and the United States. By contrast in the Czech Republic, Denmark and Sweden, this was the case for less than 5% of people.

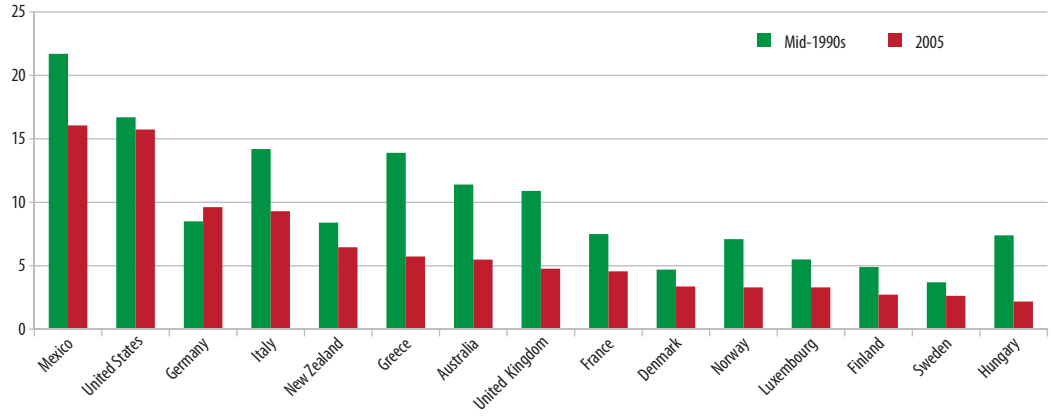
There are also differences between countries in terms of the direction of change. In some cases, relative poverty clearly went up from the mid-1980s onwards – for example, in Germany, Ireland, Japan, and New Zealand – and in others it declined, most markedly in Belgium. During the decade up to the mid-2000s, relative poverty went up in 15 countries, climbing more than 2% in Canada, Finland, Germany, Ireland, Luxembourg and New Zealand. Relative poverty declined in nine other countries, with declines of more

than 2% in Italy, Mexico and the United Kingdom. In the cases of Finland, Luxembourg and Sweden, the increases occurred from comparatively low starting points.

Patterns of absolute poverty have been more consistent. "Absolute poverty" measures the proportion of people in a particular year who earn less than half the median (mid-point) income of a previous year. Unlike "relative poverty" – where the threshold goes up with rising median incomes – "absolute" measures hold this threshold constant in real terms so that it can be compared with subsequent years. Between the mid-1990s and 2005, absolute poverty went down in 14 of the 15 countries for which data are available. The exceptional case – Germany – experienced both rising absolute and relative poverty over the decade.

Figure 2.8. **Absolute poverty going down**

Percentage of people who earn less than 50% of the median income of mid-1990s, in the mid-1990s and 2005



StatLink http://dx.doi.org/10.1787/888932321036

Source: OECD (2008), *Growing Unequal? Income Distribution and Poverty in OECD Countries*.

And education?

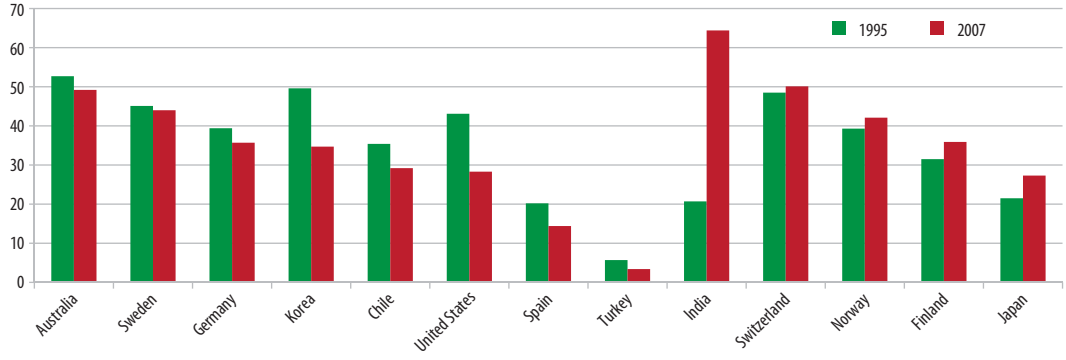
- Initial education and lifelong learning play a role in lifting people out of poverty by, for example, providing them with the right skills for the labour market. What kinds of programmes or incentives would strengthen this function of education?
- While absolute poverty is decreasing, relative poverty has increased in OECD countries, suggesting that one of the potential issues is social exclusion. How can education support individual students experiencing social exclusion to improve their social integration and educational success?
- Although absolute poverty is going down, the costs of higher education have risen steeply in several OECD countries. How far is access to higher education excluded for those experiencing poverty?

NEW FORMS OF COMMUNITY ENGAGEMENT

What kinds of communities do we live in? How connected are we with other people? Everyday experience tells us that there is more mobility and fewer stable residential communities; we seem to live in a more individualistic world with fewer of the traditional reference points of extended family, community, church and workplace. While in general this may be true, the nature of community and connection may be changing, rather than disappearing. This section examines trends in membership of voluntary organisations and in engagement in new forms of communities for collaboration and networking online. These are important issues for education: schools, vocational and tertiary education often rely on strong community links and resources; weakening community ties may mean that people look increasingly to education (including adult education) to provide their sense of belonging.

Figure 2.9. **Membership of voluntary organisations – wide variation, no clear trends**

Percentage of people reporting to be a member of a sport or other recreational club, 1995 and 2007



StatLink http://dx.doi.org/10.1787/888932321055

Note: Based on self-reporting.

Source: World Values Survey (2009), *Four-wave aggregate of the Values Studies*.

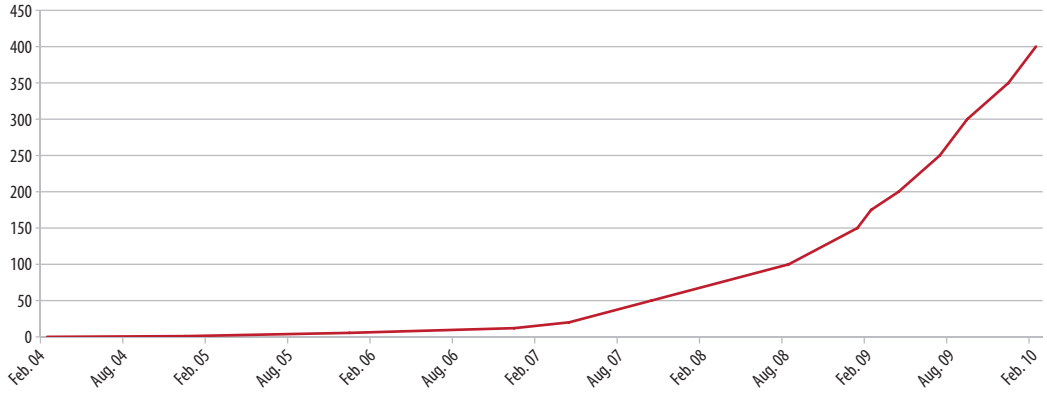
Evidence from the World Values Survey does not confirm a general pattern of decline in membership of sport and other recreational facilities – one indication of social activity. Of the 13 countries permitting such comparisons over consistent time periods, it went up in five of them and fell in eight. The largest decreases in membership of sport and other recreational facilities since the mid-1990s were in Korea and the United States. More people participated in sports and recreational clubs in the Scandinavian countries of Finland and Norway, with hardly any change in Sweden. The most spectacular increase occurred in India, where almost 65% of people reported being a member of a sports or recreational club in 2007, some 40 percentage points higher than in 1995.

Despite any changing patterns of community engagement occurring in particular countries, new forms of belonging are emerging with the widespread trend for people to engage in online communities. These communities differ in many respects, but they share a reliance on user-generated content and rapid growth in participants. Like many other websites of its kind, *Facebook* is designed to facilitate "social networking" – communication

and exchange between people in the form of text, image or video. It is accessed by millions of people every day, and the figure below shows that this site alone has grown in only six years to involve as many as 400 million people worldwide. Such forms of engagement are clearly very different from being active in such traditional communities as, say, voluntary associations or churches. There are legitimate questions to be asked about the quality as well as the quantity of such forms of networking.

Figure 2.10. **Increasing engagement with online communities**

Number of active Facebook users (in millions), 2004-2010



StatLink http://dx.doi.org/10.1787/888932321074

Source: Facebook (2010), *Press Room: Company Timeline*.

And education?

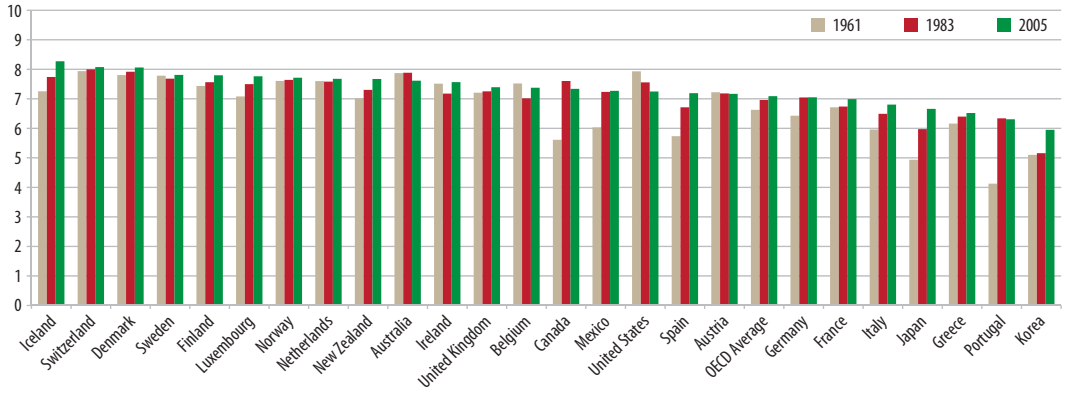
- What role should education play in encouraging students to value and participate in community groups? What kinds of skills do individuals need to successfully engage in these communities?
- To what extent do educational institutions act as a social anchor for communities? Do young people and older adults need educational institutions and programmes to give them a locus for social belonging?
- Internet-based social networks are opening up new possibilities for creating and sharing knowledge. What are the implications for learning? For research?

MORE SATISFIED WITH LIFE

Life satisfaction is very difficult to measure accurately or compare internationally. This section brings together both attitudinal and behavioural evidence for levels of life satisfaction – self-reported satisfaction with life and rates of suicide – to examine the trends. In general, the direction of change is positive, with relatively high and often rising reported levels of satisfaction and declining rates of suicide. Economic prosperity has often been used as a proxy for well-being, and rising satisfaction partly supports that, but measures of life satisfaction also point to the diminishing returns of increased affluence. Rising levels of educational attainment may well also be part of the complex compound of what makes people more satisfied with their lives.

Figure 2.11. **Generally high levels of life satisfaction**

"Life satisfaction" surveyed with the question "All things considered, how satisfied are you with your life as a whole these days?" on a scale of 0 (dissatisfied) to 10 (satisfied), in 1961, 1983 and 2005



StatLink http://dx.doi.org/10.1787/888932321093

Source: Abdallah S. *et al.* (2009), *The (un)Happy Planet Index 2.0. Why good lives don't have to cost the Earth.*

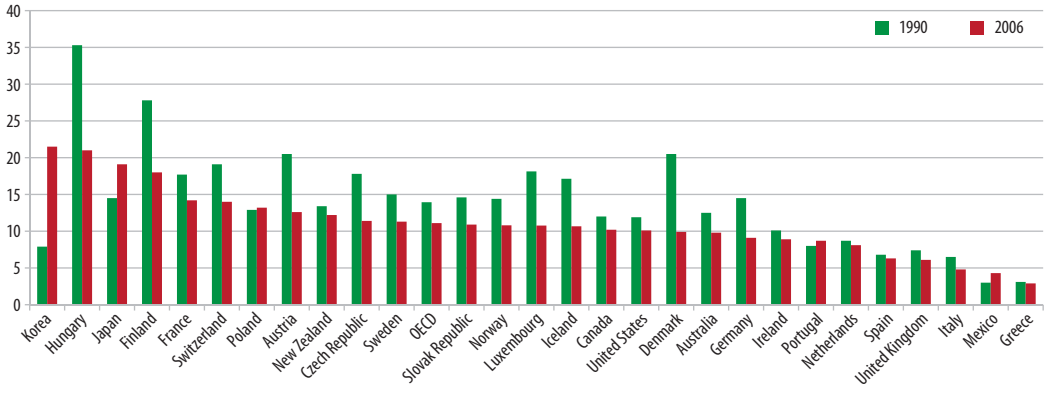
Four key features stand out regarding patterns of life satisfaction in OECD countries since the beginning of the 1960s. First, recent levels are generally high, averaging around seven on a 10-point scale. Second, it has generally changed very little over the past 50 years. The greatest change was seen in Canada, Iceland, Japan, Mexico, Portugal and Spain, the only countries that experienced increases in average life satisfaction of more than 10%. Third, there are only moderate differences between countries. The highest levels were recorded in Iceland, at 8.2 out of 10 in 2005, while the lowest levels were recorded in Korea at around 6 out of 10 in the same year. Fourth, life satisfaction seems to be not necessarily related to a country's affluence. Measures of happiness, which includes life satisfaction, are generally higher in more affluent countries, but there are diminishing returns in countries where per person wealth (GDP per capita) exceeds USD 15 000, a level well below the OECD average.

The idea that life satisfaction is rising is further supported by declining rates of suicide. This rather dramatic indicator of lack of satisfaction went down in 23 of the 28 countries included in the figure. It decreased on average across OECD countries by

2.8 suicides per 100 000 population, from 13.9 in 1990 to 11.1 in 2006. Rates in Greece, Italy and Mexico were very low, recording five or less suicides per 100 000 population in 2006. The exceptions to falling rates of suicide in recent years are Japan, Korea, Mexico, Poland and Portugal. The biggest increases were in Japan and Korea, especially the latter where suicide rates went up sharply between 1990 and 2006 from around 8 per 100 000 population to over 20.

Figure 2.12. **Suicide rates dropping**

Number of suicides per 100 000 population, in 1990 and 2006



StatLink http://dx.doi.org/10.1787/888932321112

Source: OECD (2009), *Health at a Glance 2009: OECD Indicators.*

And education?

- On balance, does more education lead to greater satisfaction in life and which aspects of education are particularly influential? Should they be further encouraged?
- What role might lifelong learning play in the overall goal of improving societal and individual well-being?
- Are measures of well-being too focused on the economic side and not enough on the social and psychological sides? Are these different goals complementary or in competition with each other? How should education find an appropriate balance?

FIND OUT MORE

Relevant sources

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The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Definitions and measurement

- *Population projections*: United Nations projections of future national population size are derived from the most recent data on population size, taking into account past fertility, mortality and international migration.
- *Old-age dependency ratio*: This ratio compares the proportion of the population that is over 65 years with those of working age (15-64 years) and is typically used as an indicator of the number of people who are elderly and financially dependent. However, it should be noted here that this ratio is merely an indicator, in recognition that many in the 65+ age group are not dependent, just as many of those aged 15-64 years are not in paid employment, either.
- *Total expenditure on health*: The total expenditure includes the sum spent on activities that – through application of medical, paramedical, and nursing knowledge and technology – have the goals of: Promoting health and preventing disease; curing illness and reducing premature mortality; caring for persons affected by chronic illness who require nursing care; caring for persons with health-related impairments, disability, and handicaps who require nursing care; assisting patients to die with dignity; providing and administering public health; and providing and administering health programmes, health insurance and other funding arrangements. General public safety measures such as technical standards monitoring and road safety are not considered as part of expenditure on health. Activities such as food and hygiene control and health research and development are considered health-related, but are not included in total health expenditure.
- *Expenditure on education as a proportion of national wealth*: This indicator represents total expenditure on education in a country as a percentage of GDP. Total expenditure includes both public and private finances spent on all educational institutions, instructional and non-instructional, at all levels.
- *Gini coefficient*: A common measure of equality which ranges from 0 in the case of "perfect equality" (each share of the population gets the same share of total income) to 100 in the case of "perfect inequality" (all income goes to the share of the population with the highest income). In calculating this figure, household income is adjusted to take account of household size.
- *Income growth by quintiles*: This refers to the average annual growth of income for each quintile of the income distribution. In the figure we distinguish between the 20% of the population with lowest incomes, the 20% with the highest incomes and the 60% in between.
- *Relative poverty*: This measure identifies the people poor, relative to the incomes of their fellow citizens. The income level at which someone is identified as poor is at half of the median income after taxes and transfers, where the median refers to the mid-point between the highest and lowest income levels in the population.
- *Absolute poverty*: This measure contrasts with relative poverty by identifying the numbers of people in a population who earn less than the median income of a past year, in this case the level from ten years earlier. By comparing to income levels in the past, absolute poverty highlights changes in income over time.
- *World Values Survey*: To date, this globally administered survey has been conducted in five waves (1981-1984, 1989-1993, 1994-1999, 1999-2004 and 2005-2008). A number of topics are surveyed in 97 societies worldwide during each of these periods. In this

book, the survey data has been used to present rates of membership of sports and recreational clubs.

- *Life satisfaction*: The satisfaction individuals have with their life is often used to indicate levels of wellbeing. It relies on self-reporting in a survey asking the following question: "All things considered, how satisfied are you with your life as a whole these days?" Responses are gauged on a scale of 0-10, where 0 is dissatisfied and 10 is satisfied. Data for OECD countries are available over a considerable period. However, it will be some time before there is a robust, international dataset.

Chapter 3

The changing world of work

***Changing life cycle patterns**: changing number of years prior to being in the job market, out of employment, in employment and retirement for women and men.*

***More flexibility in the labour market**? Flexibility is examined through trends in the numbers in their current job for longer than 10 years and part-time working by men and women.*

***Knowledge-intensive economies**: the growing importance of R&D activities and the number of researchers employed in different countries.*

***Massification and internationalisation of higher education**: the rapid expansion of higher education as part of the knowledge-intensive economy comparing the percentage of graduates in younger and older generations, and the long-term growth of international students.*

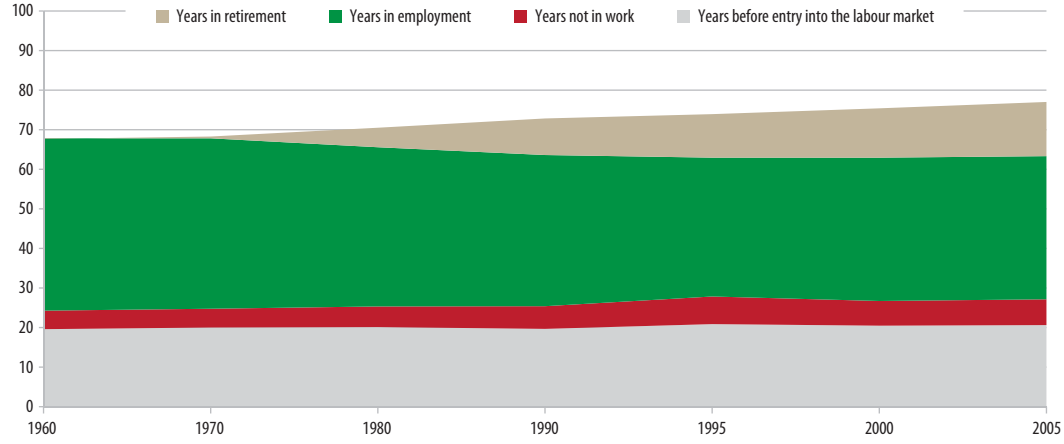
***Women in the labour market**: trends in female employment and the rising qualification levels of women compared with men.*

CHANGING LIFE CYCLE PATTERNS

The age structures of OECD countries are changing, but so are life patterns, with the time allocated to the different phases – education, parenthood, employment, retirement – evolving through generations. The long-term trends are markedly different for men and women, especially with the rising participation of women in the labour market, and so they are shown separately. The number of years spent in retirement is going up for both men and women, whereas the average amount of time in employment over the life course has been dropping for men and increasing for women. Education is part of the picture, with time spent in education now longer for both men and women. However, these changes are rather more modest in life cycle terms compared with the major shifts in career, retirement and, for women, the declining time spent out of work for raising children. Key questions for education relate both to the nature of individual lives, and to the sustainability of continually increasing time devoted to education and retirement compared with time engaged in employment.

Figure 3.1. **Years in employment going down for men**

Male allocation of time across the life-course within OECD countries, 1960-2005



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Source: OECD (2009), *Society at a Glance 2009: OECD Social Indicators*.

There are a number of trends that emerge from these figures, including the growing time spent in retirement, the shifting proportion of time in employment – going up for women and down for men – and, for women, the declining time spent out of the labour market. It is important to note that while the figures may suggest consecutive life phases, the time labelled as "not in work" brings together periods from different points throughout the life cycle that may be alternated with employment, rather than concentrated in a single period of time.

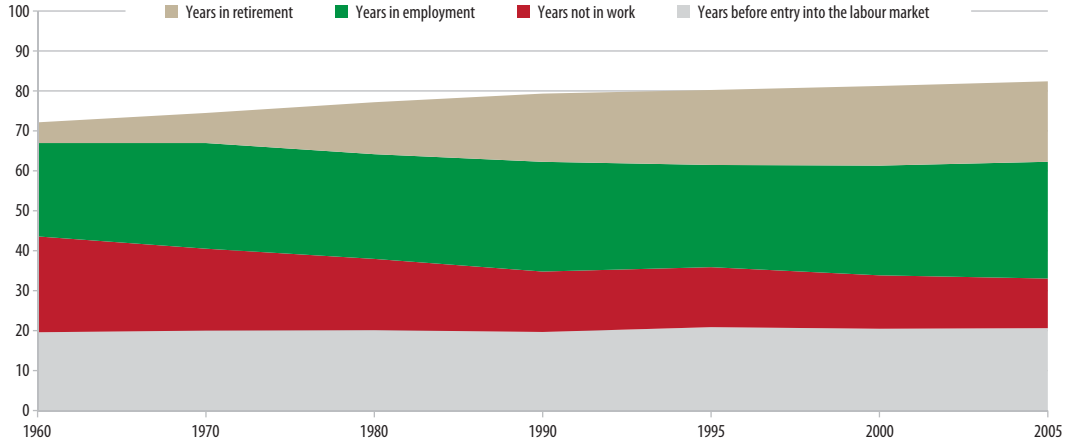
The figure above shows that, compared with 1960, men in OECD countries spent an average of two more years out of work in the mid-2000s (not counting retirement). Overall, in 2005 men worked eight years less than they did in 1960 and enjoyed significantly more time in retirement. In comparison, the greater participation of women in the work-force

can be seen in Figure 3.2, in 2005 women worked on average six years more than they did in 1960. Although women are still in employment for comparatively less of their lives than men, the life cycle patterns of women and men are converging.

A coinciding pattern observed in all OECD countries is a decline in the number of hours worked per year by the total population. Earlier retirement and shorter working hours suggests that lives are less dominated by work, even if factors including long journey times, greater stress and blurring boundaries between office and home life make it feel as though work is more demanding of time. Nevertheless, these trends make the reason "lack of time" commonly given by adults who do not participate in education less and less convincing.

Figure 3.2. **Years in employment going up for women**

Female allocation of time across the life-course within OECD countries, 1960-2005



StatLink http://dx.doi.org/10.1787/888932321150

Source: OECD (2009), *Society at a Glance 2009: OECD Social Indicators*.

And education?

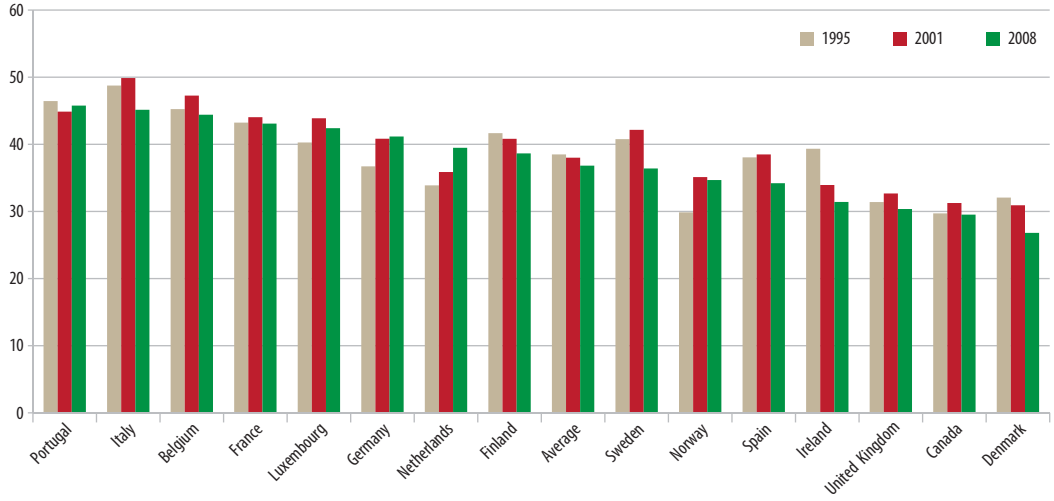
- Are the ever-increasing periods of time spent in education by young people sustainable, especially if the pattern is for older people in work to stop sooner?
- Is there sufficient flexibility to participate in education at different times over the life course, and do regulations surrounding employment and pensions do enough to encourage recurrent participation?
- Longer periods in retirement open up time for learning, whether for leisure or voluntary activities or for work-related activity. How well are adult education opportunities responding to this potential demand?

MORE FLEXIBILITY IN THE LABOUR MARKET?

An important objective of education and training is to prepare young people for the labour market and to help organise professional development for older working adults thereafter. "Flexibility" is commonly heard as characteristic for working life in the 21st century; relevant trends on flexibility and flux thus form a natural part of education's wider context. To address these issues, this section examines evidence relating to the changes over time in the numbers who are long-term incumbents of their present job: if jobs and careers are rapidly changing we might expect to find low and declining numbers in the same job for more than ten years. This section also look at the incidence of part-time working which offers another form of flexibility.

Figure 3.3. **Modest fall in numbers in the same job for more than ten years**

Percentage of people working in their current job for their current employer longer than ten years, in 1995, 2001 and 2008



StatLink http://dx.doi.org/10.1787/888932321169

Source: OECD (2008), *OECD.Stat: Employment by Job Tenure Intervals in Number of Persons.*

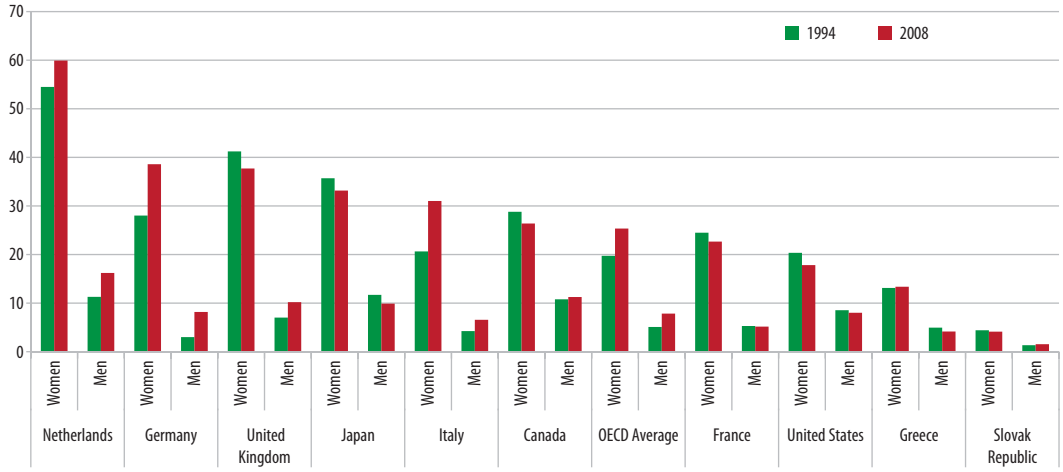
The proportion of those who have been in their current job with the same employer for ten years or more offers one angle from which to examine stability and flux. In the 15 OECD countries with relevant data, the levels stand between a quarter and a third of the population in Canada, Denmark, Ireland, Spain and the United Kingdom, on the one hand, and between 40% and 50% in Belgium, France, Germany, Italy, Luxembourg and Portugal, on the other. Since the mid-1990s, the proportion of such long-term job incumbents went down by a relatively modest 1.7% on average across the 15 countries shown. In some countries the fall was marked – more than 4% in Denmark, Ireland and Sweden. In Germany, Luxembourg, the Netherlands and Norway long-term job incumbency actually went up. But, in 10 of the 15 countries, there were only fluctuations during the period, rather than a consistent trend. Overall, this offers no more than modest support for a trend towards declining stability, bearing in mind that it is based on only a single

indicator in 15 countries since the mid-1990s. However, similar data show that numbers in their job for less than one year and for less than three years have not risen, which might have been expected were there greater flux.

Part-time working has increased on average across OECD countries between 1994 and 2008 for both women and men. Even here the trends vary. For instance, rates increased in Italy, Germany and the Netherlands, but went down in Japan and the United States. The differences between countries are very wide. In the Netherlands, almost 60% of women and 16% of men work part-time, whereas in the Slovak Republic the figures are less than 5% for women and 1.5% for men.

Figure 3.4. **Diverse trends for part-time work**

Percentage of people working in part-time jobs (less than 30 hours per week) in selected OECD countries by gender, in 1994 and 2008



StatLink http://dx.doi.org/10.1787/888932321188

Source: OECD (2010), *OECD.Stat: Labour Force Statistics*.

And education?

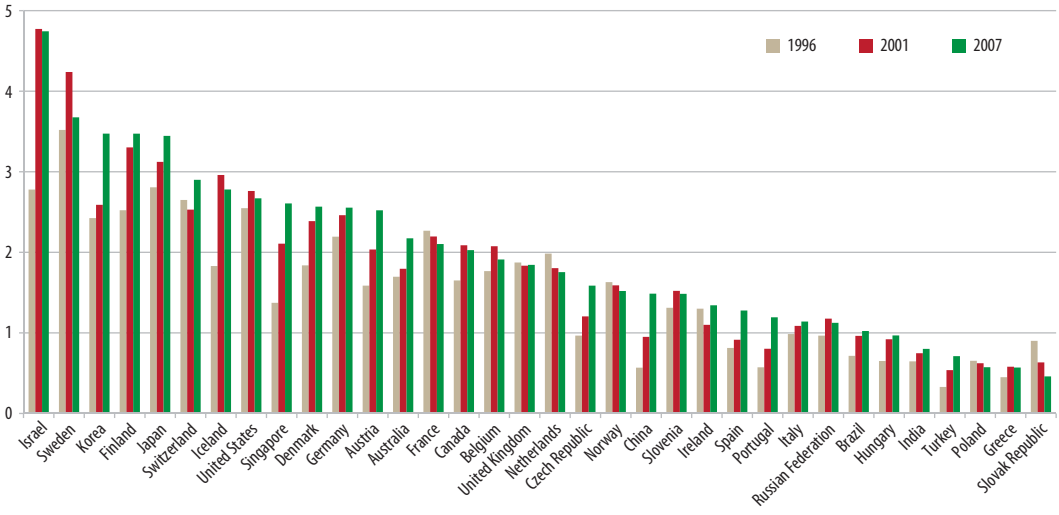
- How well does education prepare young people to cope with, even thrive in, situations of uncertainty and change?
- How effective are systems of professional development and retraining? Do public and private sector provision complement and build on each other? Is there sufficient coverage for those most vulnerable to job change?
- Is there sufficient focus in secondary and tertiary education on developing transferable skills? Should the focus instead be on building expertise in specific areas? How can the two be best balanced?

KNOWLEDGE-INTENSIVE ECONOMIES

OECD countries have become more knowledge-intensive. A defining feature of knowledge-intensive economies is their focus on research and development (R&D) activities. Trends in R&D spending and employment of researchers are examined. In line with greater knowledge intensity, investments in R&D in developed countries have increased as a proportion of their GDP as has the share of researchers in these countries. For education, increasing knowledge-intensity generates the need for advanced skills and qualifications. There are also questions to be raised about the role played by the university sector in research as opposed to that played by the private research sector.

Figure 3.5. **More investment in research and development**

Total spending on R&D (public and private) as a percentage of GDP, 1996, 2001 and 2007



StatLink http://dx.doi.org/10.1787/888932321207

Source: World Bank (2010), *Open Databank*, except for data regarding Greece, Iceland, Norway, Switzerland, which are sourced from OECD (2008), *OECD Science, Technology and Industry Outlook 2008*.

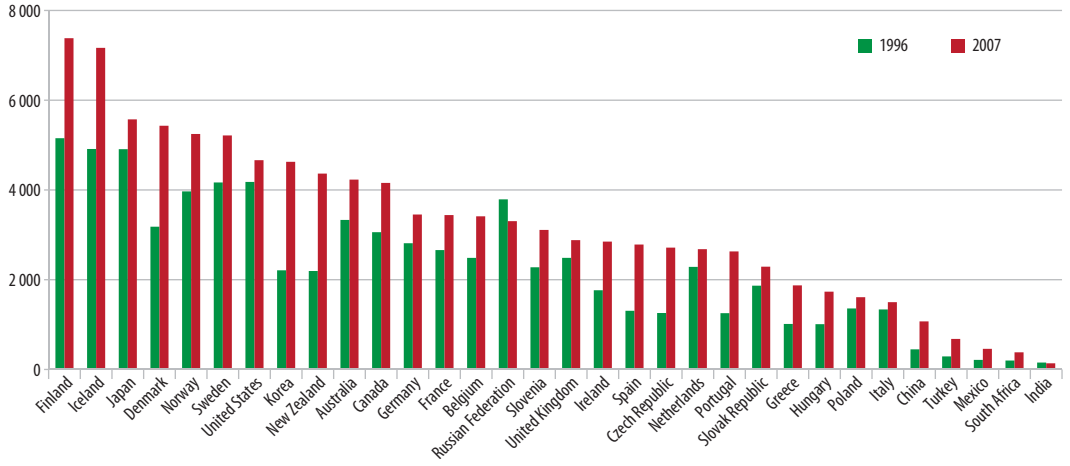
One of the key ways to illustrate the increased knowledge intensity of an economy is by its research and development (R&D) intensity, *i.e.* both private and public investment in R&D as a percentage of total economic activities (GDP). Spending on R&D has increased in many countries since the mid-1990s, as shown in the above figure. In Austria, China, Finland, Iceland, Israel, Korea and Singapore, in particular, R&D investment has risen by as much as 0.9% of GDP. If that might seem small, the increase between 1996 and 2007 translates into nearly USD 40 billion in China, almost USD 10 billion in Korea and as much as USD 2.6 billion in Finland (all figures provided in current USD, according to World Bank data for total GDP). R&D intensity is not going up in all countries: it fell by varying amounts across the three time points in France, the Netherlands, Norway, Poland, the Slovak Republic and the United Kingdom. Apart from trends, country differences in levels of investment are wide between those which now spend more than 3% on R&D

(Finland, Israel, Japan, Korea, and Sweden) and those at 1% or less (Brazil, Greece, Hungary, India, Poland, the Slovak Republic, and Turkey).

With growing investment in this sector of the economy, an increase in the number of people working in R&D would be expected and has taken place since the mid-1990s. The trend is upward in all the countries in Figure 3.6 (except the Russian Federation) and by 2007, the employment of researchers reaches its highest at over 7 300 per million people in Finland. The magnitude of growth has been greatest in Korea, where there were over 2 400 more researchers per million people in 2007 than there were in 1996. The demand for highly skilled knowledge workers, including researchers, is one important factor behind the expansion of higher education and this is discussed in the next section.

Figure 3.6. **Increasing numbers of people working in R&D**

Number of researchers per million people, 1996 and 2007



StatLink http://dx.doi.org/10.1787/888932321226

Source: World Bank (2010), *Open Databank*.

And education?

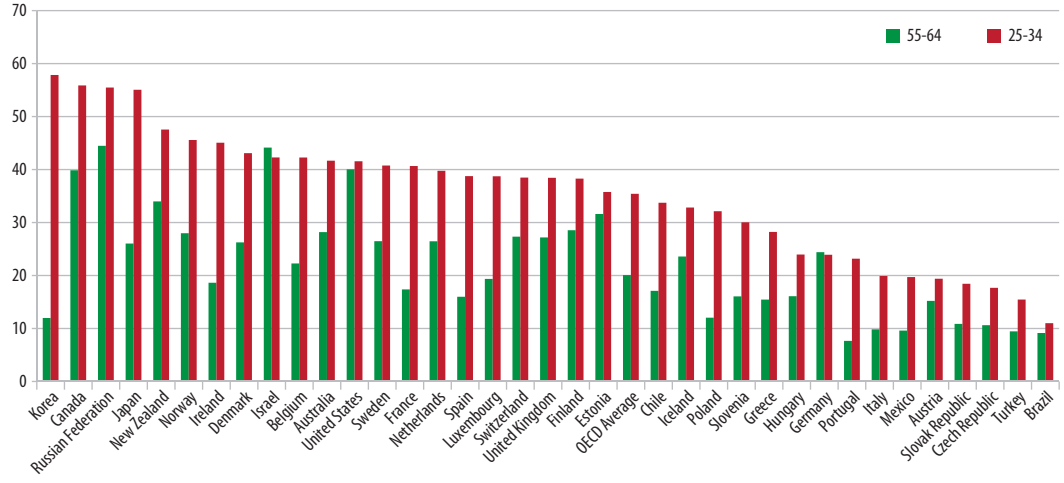
- Is the rhetoric of creating "knowledge-intensive economies" matched by what takes place in both the public and private sectors? What are the specific responsibilities of education systems?
- Are the policies of governments and tertiary institutions sufficiently aligned to provide the funding and training to power the knowledge-intensive economies of the future?
- Should more emphasis be placed on skills such as creativity, decision-making, cooperation, and the ability to find pertinent, reliable information? Are these skills adequately developed through education and training?

MASSIFICATION AND GLOBALISATION OF HIGHER EDUCATION

Alongside the focus on research and development, another characteristic of knowledge-intensive societies is a well-educated population. In many OECD countries, the numbers now enjoying an extended education are up to levels scarcely imagined half a century ago. Attainment of secondary education has become universalised, while there is mass entry into higher education. Many more of the young people entering the labour market today need higher-level qualifications simply to be eligible and competitive. OECD countries have not only seen a "massification" of higher education, but increasingly it has also globalised, with the proportion of international students nearly doubling in OECD countries since the late 1990s. The highest numbers of international students come from emerging economies, particularly China and India.

Figure 3.7. **Many more people with higher education**

Percentage of population with higher education, in age groups 25-34 and 55-64



StatLink http://dx.doi.org/10.1787/888932321245

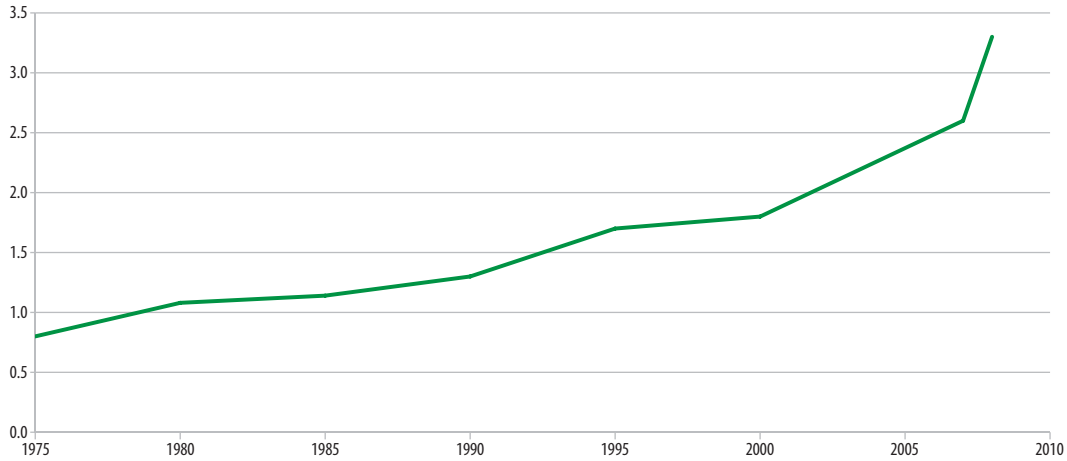
Source: OECD (2010), *Education at a Glance 2010: OECD Indicators*.

It is common to describe the changing educational opportunities and attainments in OECD countries in terms of the "massification" of higher education. More than 35% of those aged 25-34 years across OECD countries have completed higher education, a figure significantly higher than the average of 20% for those aged 55-64 years (itself well up from the levels when their parents and grandparents attended education). Participation rates more than doubled in France, Ireland, Italy, Japan, Luxembourg, Mexico, Poland and Spain. The change was even more dramatic in Portugal, where twice as many people aged 25-34 years have completed higher education than those in the older age group. However, the most spectacular growth occurred in Korea, where the rate of participation in higher education among 25-34 year-olds is nearly five times that of people aged 55-64 years, from 12% to 58%. Given current economic difficulties, more people might be expected to seek post-secondary education and training in order to maintain or improve their position in the labour market, at the same time as the funds available for higher education are under severe pressure.

More and more students worldwide study outside their country of citizenship. In 2008, their numbers reached 3.3 million. Half attend higher education in the top five destination countries: the United States (18.7%), the United Kingdom (10.0%), Germany (7.3%), France (7.3%) and Australia (6.9%). Despite the increase in numbers of international students worldwide, their proportion of the total student population has remained stable at 1.8% since 1998, largely as a result of the increasing numbers of students in higher education. But, member countries of the OECD have experienced a slower rate of expansion in higher education than elsewhere and have attracted many more international students. The result has been a near doubling of the proportion of international students among the total higher education student body in OECD countries from 4.5% in 1998 to 8.7% in 2007.

Figure 3.8. **Rapidly increasing numbers of international students**

Number of students in higher education studying outside their country of citizenship worldwide (in millions), 1975-2008



StatLink http://dx.doi.org/10.1787/888932321264

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

And education?

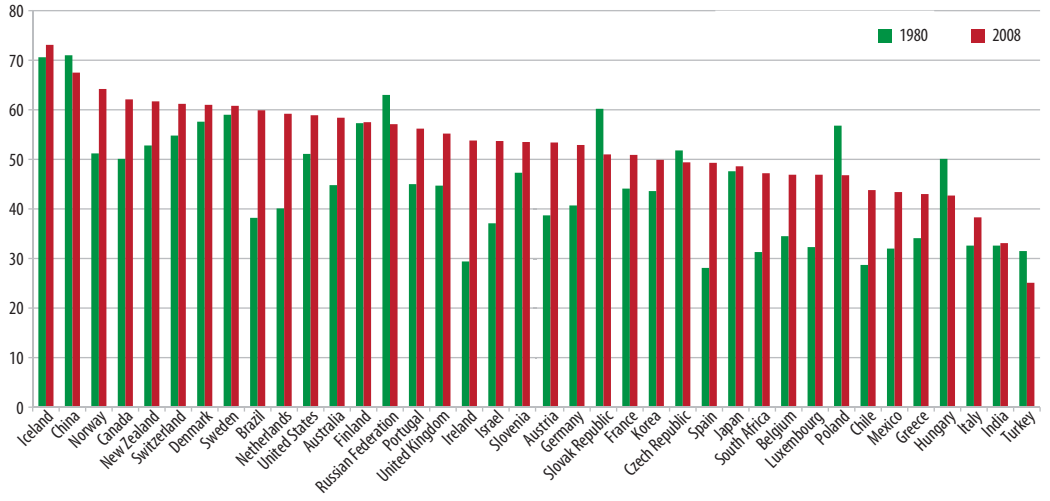
- Educational attainment is linked to greater individual prosperity, health and wellbeing. Are these the result of higher levels of knowledge and skills, or are we over-educating our workforce?
- Where teachers were once some of the best educated within local communities, increasingly parents now have higher attainment. What challenges will this create for teachers? Has the upward social mobility once associated with becoming a teacher become less important, reducing the incentive to choose this career path?
- In what ways can tertiary educators most effectively engage with, and make use of, the diversity of students in their courses? What kinds of support services should universities provide for international students?

WOMEN IN THE LABOUR MARKET

One of the most significant social transformations of the past half century has been the move towards equality of opportunity for women. Increasing numbers of women are in paid employment, and many are qualified to levels now surpassing those of men, albeit with continuing problems of reconciling family and working life and with a persistent gender wage gap. Rising educational attainment has clearly been an integral part of the more prominent role of women in the labour market. For education this development also raises questions about the appropriateness and effectiveness of current educational offerings for both younger and older males.

Figure 3.9. **More women working**

Percentage of women aged 15 years and older in work, in 1980 and 2008



StatLink http://dx.doi.org/10.1787/888932321283

Note: Being in work in this case means being economically active, that is, supplying labour for the production of goods and services.

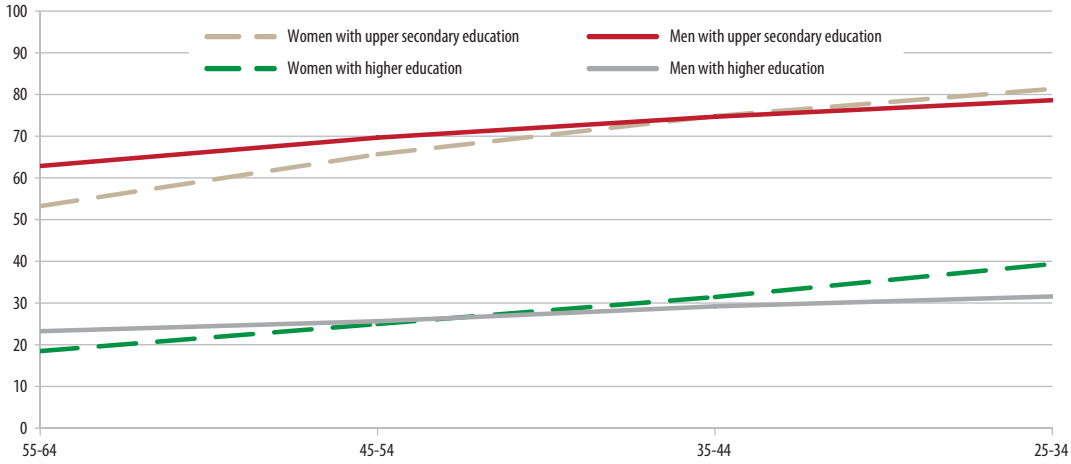
Source: World Bank (2010), *Open Databank*.

Women's participation in the labour market generally increased across the OECD and during the latter half of the 20th century. Since 1980, this has been the pattern in 32 of the 38 countries shown above. While women's participation is going up, it is nowhere close to 100%. In 1980 in only four of the countries more than 60% of working-age women were in employment and in 2008 this was the case in only eight of these countries. In 1980 three of these countries had communist systems (China, Russia and the Slovak Republic). In 2008 half of these countries were from the Nordic group. The largest advances were achieved in Brazil, Ireland and Spain and where the employment rates of working-age women rose by more than 20 percentage points in less than the three decades from 1980. Greater participation in paid employment fundamentally influences female aspirations, both educational and professional, as well as the living arrangements, family resources and home environments of the young.

The continuing rise of female educational attainment is intricately tied to women's growing role in employment, both as a cause and a reflection of it. While attainment levels are higher for both men and women in the younger age groups, the generational differences for women are greater. Among young adults aged 25-34 years, 39% of women compared with 32% of men across OECD countries have attained tertiary level education. The equivalent figures for upper secondary education are 81% and 78%, respectively.

Figure 3.10. **Women overtaking men in education**

Percentage of men and women with upper secondary and higher education in the OECD area, by age group



StatLink http://dx.doi.org/10.1787/888932321302

Note: Charting attainment levels by age gives a good indication of through-time change and a broad indication of the qualifications brought to the labour market.

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

And education?

- How are schools experiencing the impact of ever-greater numbers of mothers with full professional careers? Has it changed the balance of responsibilities between schools and families in raising children – for better or worse? And, has it altered interaction with fathers?
- What role does education play, through implicit and explicit guidance, in shaping the professional and educational choices of males and females? What are the priorities for future change in this respect?
- What has caused the higher levels of educational attainment by women? Is it likely to continue? What will be the long-term social and economic effects?

FIND OUT MORE

Relevant sources

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The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Definitions and measurement

- *Job tenure*: The length of time workers have been in their current or main job or with their current employer is referred to as job tenure. This information is valuable for estimating the degree of fluidity and flexibility in the labour market, and for identifying the areas of economic activity where the turnover of labour is rapid or otherwise.
- *Part-time work*: Persons who usually work less than 30 hours per week in their main job. Both employees and self-employed may be part-time workers. Employment is generally measured through household labour force surveys and, according to the ILO Guidelines, employed persons are defined as those aged 15 and over who report that they have worked in gainful employment for at least one hour in the previous week.
- *Research and development (R&D) intensity*: Activity in the R&D sector of an economy is one indicator for its knowledge-intensity. It is calculated from the total spending on R&D from both public and private sources as a percentage of the total GDP of the economy.
- *Educational attainment*: Attainment profiles are based on the percentage of a certain age group in the population that has completed the specified level of education.

Chapter 4

Transformation of childhood

***Living in more diverse families**: long-term trends in numbers of marriages and divorces, as well as the share of families headed by a single parent.*

***Smaller families, older parents**: the long-term trend to declining birth rates, as well as the older age of mothers when they have their first child.*

***Children's health**: child health examined through obesity levels – growing rapidly in a number of countries – and prescriptions for behavioural disorders in children.*

***Children's inheritance of life chances**: more children live in households defined as being below poverty levels, while the inter-generational bond in educational attainment levels may be loosening.*

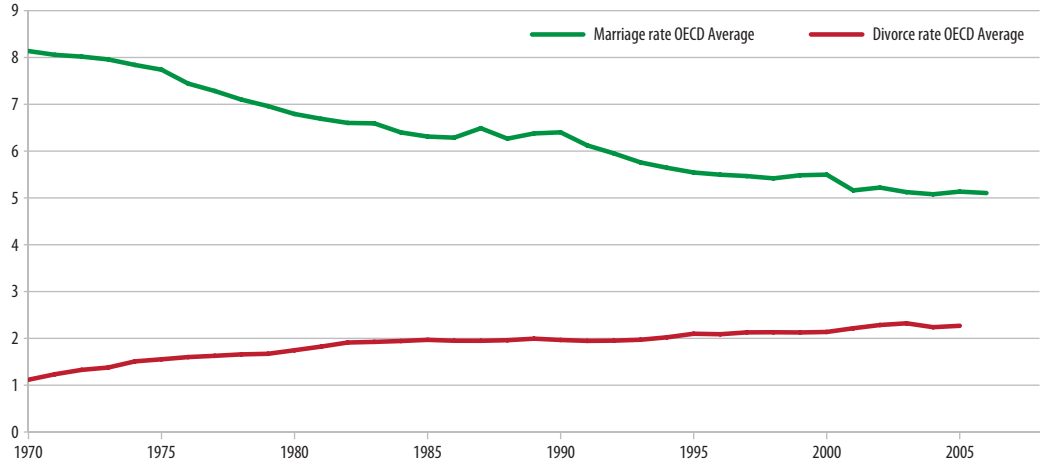
***Expecting more of children**: the growing general expectations that children should work hard but also be imaginative.*

LIVING IN MORE DIVERSE FAMILIES

Family patterns are changing. In the 19th century, extended families were important economic units, as well as social networks. The nuclear family, where the mother took care of the children and the father worked outside the home, was particularly strong in OECD countries in the first half of the 20th century. In more recent years, family structures have continued to evolve: marriage is less prevalent; couples are increasingly living together without being married; separations and divorces are common; and numbers of both reconstructed and single-parent families are increasing. Although the nuclear family is still important, it is fragmenting towards more complex configurations of home life.

Figure 4.1. **Fewer married couples**

Annual number of marriages and divorces per 1 000 population, 1970-2006



StatLink http://dx.doi.org/10.1787/888932321321

Source: OECD (2009), *Society at a Glance 2009: OECD Social Indicators.*

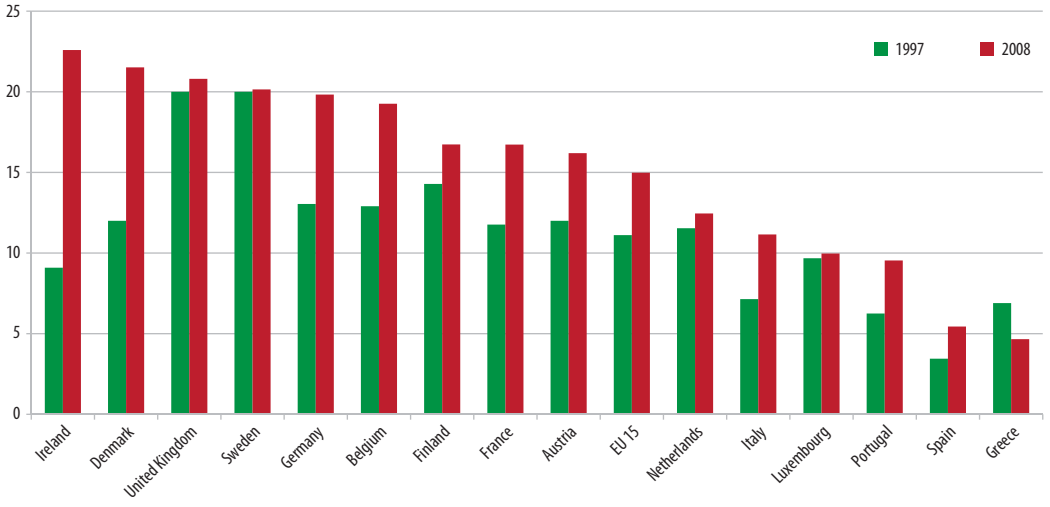
Figure 4.1 illustrates the changing patterns of partnership and living arrangements in recent decades, through rates of marriage and divorce across the OECD area. Marriage rates have steadily declined on average from more than eight per thousand population in a year to only five. Conversely, divorce rates have increased from just over one per thousand population in a year to nearly 2.3. While in 1970 there were eight times the number of marriages as divorces, by 2007 this gap had shrunk to just over twice as many marriages as divorces per year.

The OECD averages shown in the graph hide some marked differences between countries. Since 1970, marriage rates dropped less than one per thousand in Denmark and Sweden, compared with a decline of five or more in Hungary, the Netherlands, Portugal and Slovenia, during the same period. Rates of divorce similarly differ between countries. The rate went up by more than two per thousand population in the period shown in Belgium, Korea and Portugal while in Hungary, Iceland, Ireland, Italy, Mexico and the United States, the divorce rate increased by less than 0.5.

The structure of families in OECD countries has also been changing. The long-term trend is for numbers of children to decline (next section), while in only the decade to 2008, single-parent families have increased markedly. In the Europe Union (EU-15), the average number of single-parent families with dependent children went up from around 11% to almost 15% of all families with dependent children. More than one-fifth of families are headed by a single adult in Denmark, Ireland, Sweden and the United Kingdom. Among the 15 countries shown, only Greece goes against the trend.

Figure 4.2. **More single-parent families**

Number of single parents with dependent children as a percentage of all families with dependent children, in 1997 and 2008



StatLink http://dx.doi.org/10.1787/888932321340

Source: European Commission (2010), *Eurostat*.

And education?

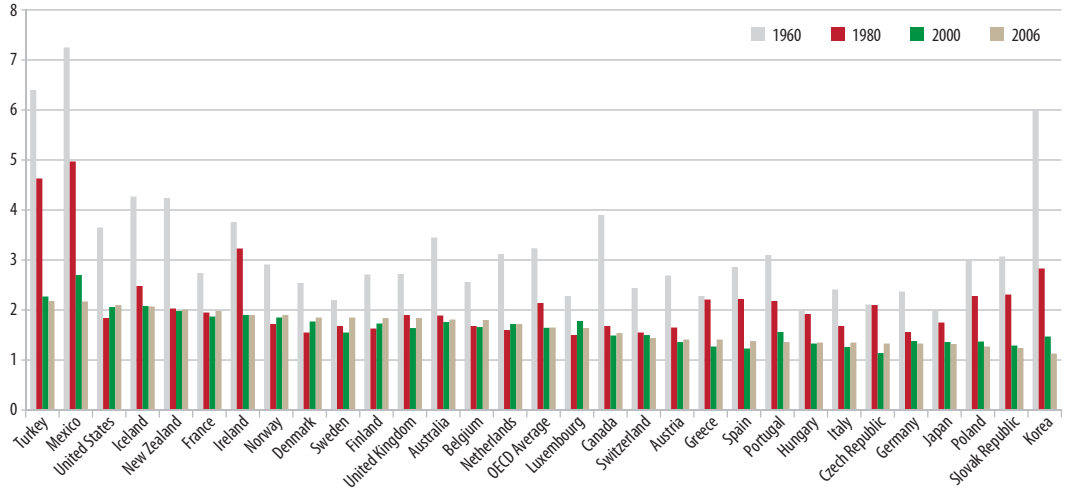
- Effective education at the school level relies on good home-school relations. How does the growing diversity of family situations affect the nature of these relations?
- Parental divorce causes significant stress for children and young people – are schools equipped to deal with the additional problems and indeed should they?
- As more of us move through disruptive transitions throughout our lives, does this mean that adults are more or less likely to return to learning? Can individuals be better supported to engage in lifelong learning during these transitional periods?

SMALLER FAMILIES, OLDER PARENTS

There has been a clear, long-term decline in the numbers of children being born, with smaller families, parenthood coming later, and more women choosing not to have children at all. Education is part of the story, with higher levels of attainment tending to be associated with fewer children. This development has an obvious impact on the age structure of the population (see Figure 2.1), but it also fundamentally influences the family environments in which children grow up, with fewer siblings and increasingly older parents. The impact is felt directly by educational planners, who must cope with falling numbers in some age groups and rising numbers in others, but it is also felt by teachers in their interactions with both students and their families.

Figure 4.3. **Birth rates well down in the 1960s but creeping up after 2000**

Total fertility rates: Children per woman aged 15-49, in 1960, 1980, 2000 and 2006



StatLink http://dx.doi.org/10.1787/888932321359

Source: OECD (2009), *Health at a Glance 2009: OECD Indicators.*

Birth rates in OECD countries dropped sharply and universally during the second half of the 20th century, with the average number of births for each woman aged 15-49 years halving from over 3.2 in 1960 to only 1.6 in 2000. For some countries, the fall in the number of children being born has been truly dramatic. In Korea, the rate of 6 children per woman in 1960 had fallen to only 1.1 in 2006. Birth rates remain highest in Mexico and Turkey at 2.2, but they are far lower than the rates of 7.3 and 6.4 births per woman in 1960. While most countries show a very clear drop in numbers of births, some have not experienced major change. In Sweden, for example, the rate of 1.9 in 2006 was down from only 2.2 in 1960.

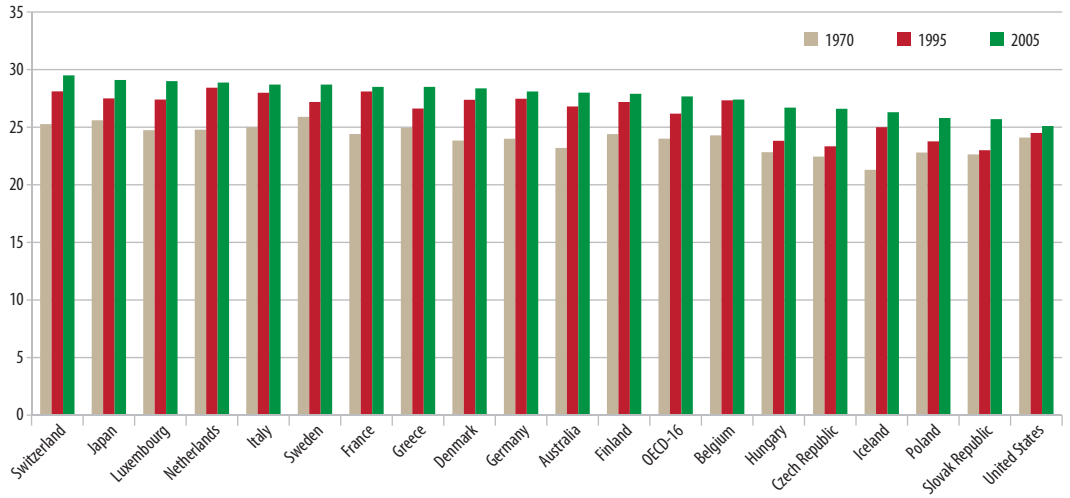
Birth rates have been creeping back up since the year 2000 in 17 OECD countries, marginally increasing the average to 1.7 by 2006. Both an increase in births given by mature mothers who had delayed childbirth and the introduction of national policies that support families and working women may have played a role in this rebound. In recent

years, birth rates have also begun to converge across most countries, with around two-thirds of them in the narrow range of 1.3 to 1.8 births per woman aged 15-49. Compare this with the differences in 1960, when some countries (the Czech Republic, Hungary and Japan) already had low birth rates of around 2, while others (Iceland, Korea, Mexico, New Zealand and Turkey) were more than twice as high.

As well as having fewer children, women in recent years tend also to be older when they have their first child. In 1970, in only 3 of the 16 countries shown below was the average age for starting motherhood over 25 years; by 2005 the average was over 25 years in all of them. That average age now approaches 28 years compared to 24 years in 1970.

Figure 4.4. **Starting parenthood later**

Average age when mothers have their first child, in 1970, 1995 and 2005



StatLink http://dx.doi.org/10.1787/888932321378

Source: OECD (2009), *Society at a Glance 2009: OECD Social Indicators*.

And education?

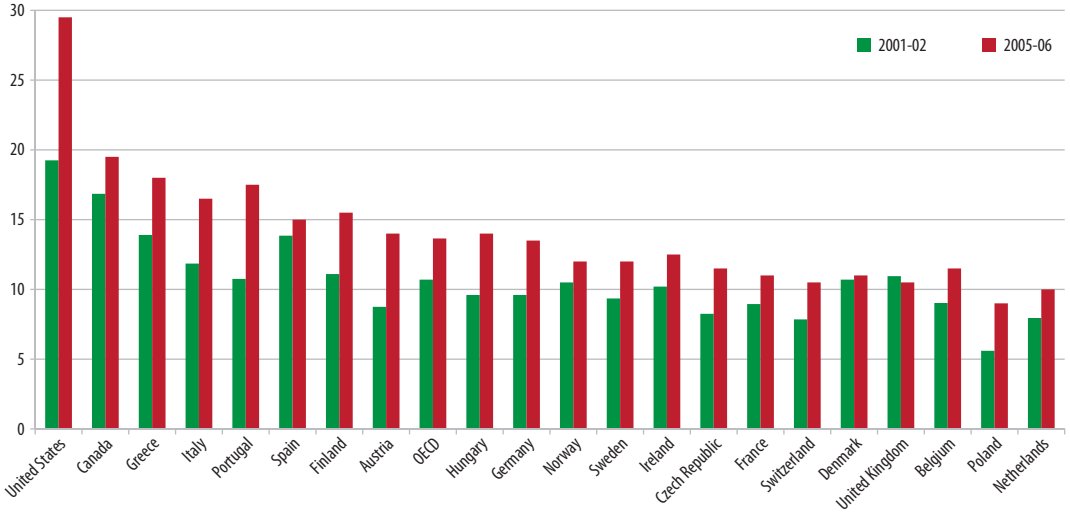
- What does it mean for young people coming into education to have older parents and fewer or, often, no brothers and sisters? How does it change the way in which they experience (school) life, and how should schools respond to this profound change?
- Smaller families allow parents to invest more time and resources into each individual child. Is this reflected in the intensity of their demands on the education their children receive?
- School rolls fall as numbers of young people fall. This presents both opportunities and problems. Is the opportunity being seized to innovate in ways that take advantage of smaller classrooms and higher per student funding? How can education systems respond to emptying and closing schools?

CHILDREN'S HEALTH

Trends related to the health of children give grounds for concern, even though earlier sections showed some very positive developments regarding the mortality of those aged less than five years. Two trends are highlighted: the increasing proportions of obese children in OECD countries and the growing numbers of children being diagnosed with Attention-Deficit Hyperactivity Disorder (ADHD). The first trend reflects changing dietary patterns and regimes of physical exercise. The second trend is more complex to interpret, as it may involve greater propensities to mental problems, or socialisation environments in homes or classrooms, or changes in diagnoses and treatments, or more likely some combination of them all. Education is affected by any general deterioration in children's health ("a healthy body means a healthy mind") and plays its own role in both shaping and addressing these health issues.

Figure 4.5. **Childhood obesity going up**

Number of obese 15-year-olds, in 2001-2002 and 2005-2006



StatLink http://dx.doi.org/10.1787/888932321397

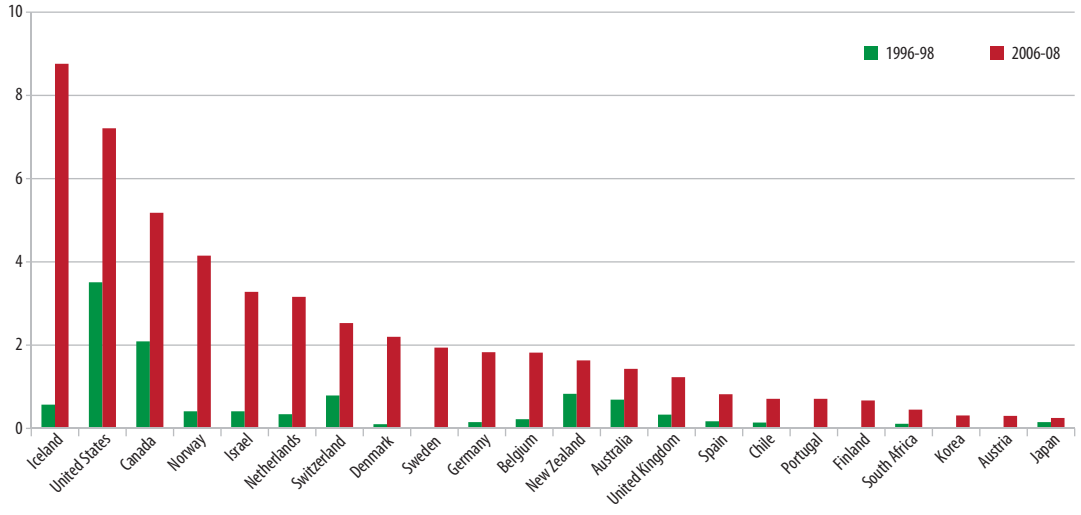
Source: OECD (2009), *Health at a Glance 2009: OECD Indicators*.

There is now clear evidence from many countries that children are becoming more obese and that the rise is taking place quickly. The data available allow only short-term trends to be charted between 2001 and 2006, but even over this short time, the increases in obesity as measured by Body Mass Index are substantial in most OECD countries. They amount on average to almost three per cent. The only exception in the above figure is the United Kingdom, where obesity amongst 15-year-olds decreased slightly. In terms of range, the United States is on one side with almost 30% obesity among 15-year-olds and the Netherlands at the other with 10%. Two key factors behind rising child obesity are a diet with a high calorie intake, on the one hand, and a sedentary lifestyle with lower levels of physical activity, on the other.

Child health is looked at through a very different lens in Figure 4.6 which shows the increasing prescription of one type of ADHD medication in different OECD countries. Good health has a crucial mental as well as physical dimension, which is especially relevant to education given its fundamental responsibility for the child's cognitive and emotional development. Prescription of this medication is measured through the proxy of the number of daily doses per thousand inhabitants per day available in a country. The figure clearly shows the increase – in some cases spectacular – of ADHD medication in these countries over a ten-year period. The figure also shows the very wide variation between countries, with Iceland and the United States at one extreme, and Austria and Japan at the other. The rapid increase and the wide variation suggest that the increasing diagnosis levels are not a simple reflection of ADHD prevalence. Rather, cultural differences, medical developments and perhaps even fashion may well play important roles in both diagnosis and treatment.

Figure 4.6. **Consumption of ADHD medication steeply rising**

Consumption of daily doses of methylphenidate per thousand inhabitants per day, in 1996-1998 and 2006-2008



StatLink http://dx.doi.org/10.1787/888932321416

Source: International Narcotics Control Board (2009), *Psychotropic Substances: Report 2009*.

And education?

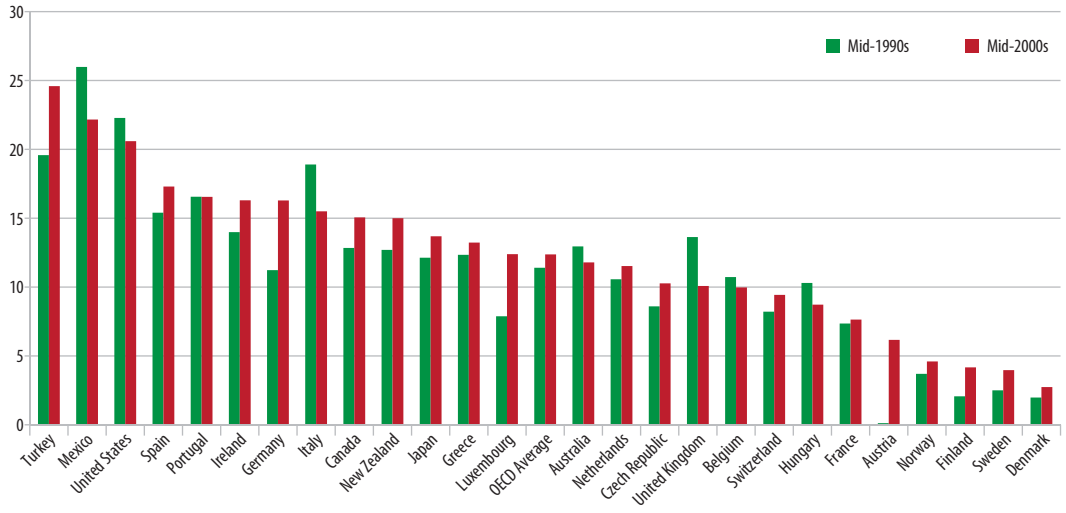
- A great deal of emphasis has been given in recent years to improving the cognitive performance of children. Does education also have a responsibility for improving students' mental and physical health?
- What can schools do to improve physical health, such as physical activities and nutrition programmes, without overloading the school curriculum?
- What is behind growing numbers of children being diagnosed with mental and behavioural conditions, such as ADHD? To what extent are schools themselves contributing to the problem? What other approaches are needed than medication?

CHILDREN'S INHERITANCE OF LIFE CHANCES

An earlier section of this book described trends in inequality and the persistence of poverty in OECD societies, despite growing affluence. In this section, the focus shifts to children. Their life-chances are importantly moulded by the conditions into which they are born and develop. As well as now being able to measure the persistence of poverty in populations as a whole, it is also possible to identify how many of these are children. Very wide variations exist between OECD countries in terms of children living in poverty, and the average has slightly risen over recent years. There are signs in Europe, however, that the intergenerational transmission of educational disadvantage may have declined. For education, the importance of social background in shaping attainment remains one of the most well charted relationships in educational and social research.

Figure 4.7. **Rates of childhood poverty tending to rise**

Percentage of children living in households earning less than 50% of the median income, in the mid-1990s and mid-2000s



StatLink http://dx.doi.org/10.1787/888932321435

Source: OECD (2009), *Society at a Glance 2009: OECD Social Indicators.*

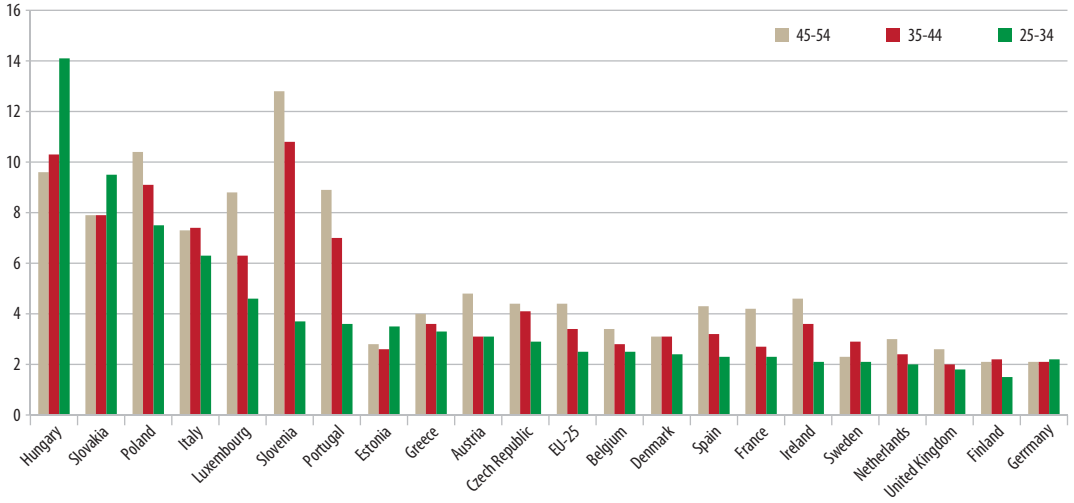
Rates of childhood poverty – children living in households earning less than 50% of the country's median income – increased in the decade up to the mid-2000s in 18 of the 26 OECD countries shown. The OECD average went up too, though the increase was relatively modest at 1%, from 11.4% to 12.4% during the period. The largest increases of around 5% were recorded in Austria, Germany, Luxembourg and Turkey. Childhood poverty rates show considerable variation, ranging from around 3% to 4% in Denmark, Finland, Norway and Sweden, to more than 20% in Mexico, Turkey and the United States. The latter two countries are among those where such poverty actually fell since the mid-1990s, the others being Australia, Belgium, Hungary, Italy and the United Kingdom.

A key issue for society is how far disadvantage (in terms of educational attainment, occupational level and income) is inherited from one generation into the next. European

Union data now permit the comparison of an individual's educational attainment with that of their parents allowing this to be charted across generations. Figure 4.8 suggests that the dependence on parental achievements in education declined over time in almost all EU member states. The largest gains were made in Portugal and Slovenia. In Slovenia in particular, someone aged 45-54 was nearly 13 times more likely to achieve a high level of education if their father also had done so than if the father only reached a lower level, whereas, for someone aged 25-34 this likelihood had fallen steeply to 3.7. Whether the trend is up or down, the dependence of a person's educational attainment on that of their parents is still particularly high in Hungary, Italy, Poland and the Slovak Republic, on the left of the figure; whereas it is now much lower in Finland, Germany, Ireland, the Netherlands, Sweden and the United Kingdom, on the right hand side. How far this change over time is a reflection of the declining elite status of higher education is another issue.

Figure 4.8. **Educational attainment becoming less dependent on parental education**

Likelihood of attaining higher education given father's educational attainment, by age group



StatLink http://dx.doi.org/10.1787/888932321454

Note: The "likelihood" is the probability of attaining higher education where a person's father completed higher education, divided by the probability of attaining higher education where their father completed only a basic education. The higher the number, the more dependent a person's educational attainment is on their father's attainment level.

Source: European Commission (2007), *Social Inclusion and Income Distribution in the European Union 2007: Monitoring report prepared by the European Observatory on the Social Situation, Social Inclusion and Income Distribution Network.*

And education?

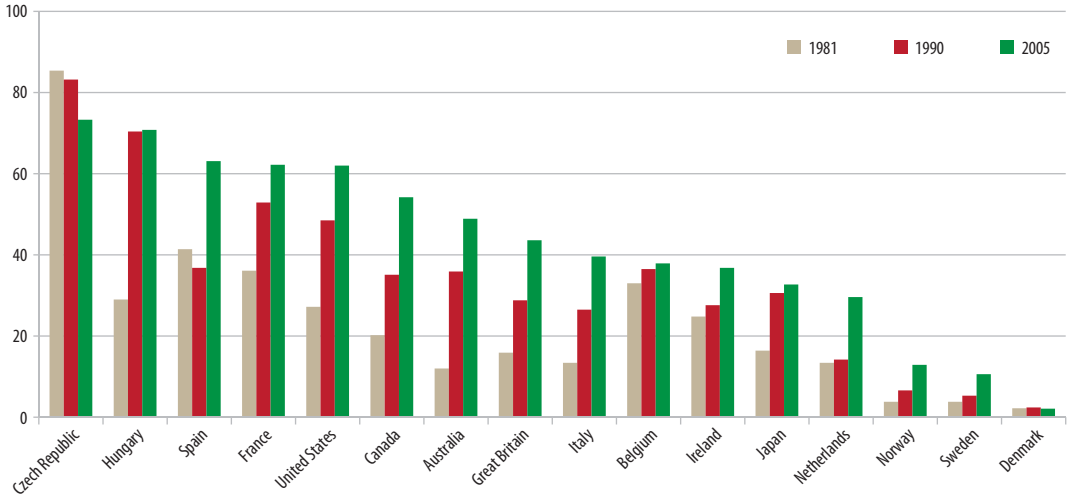
- Are poverty conditions and educational disadvantage being increasingly concentrated in particular schools and neighbourhoods? What can be done?
- How should educational institutions address the needs of students whose cognitive and social development have been affected by poverty? What role for non-formal provision?
- What can education do at later stages for those whose start in life has been particularly difficult?

EXPECTING MORE OF CHILDREN

Values are core to society but by their nature are difficult to measure. The school is one of the most important places where each generation acquires social norms and beliefs and a base of personal values for life. But what are the values that we want to instil in our children? In the countries for which there are comparable data there seem to be shifts in what we think are important qualities in our children, illustrated here by the valuing of hard work and imagination. For education, a further question concerns how far this task should be viewed as primarily their responsibility or whether it is accepted that others, as well as schools, have an important role to play.

Figure 4.9. **"Children should work hard"**

Percentage of respondents to the World Values Survey who believe that hard work is an important quality in children, in 1981, 1990 and 2005



StatLink http://dx.doi.org/10.1787/888932321473

Source: World Values Survey (2009), *Four-wave Aggregate of the Values Studies*.

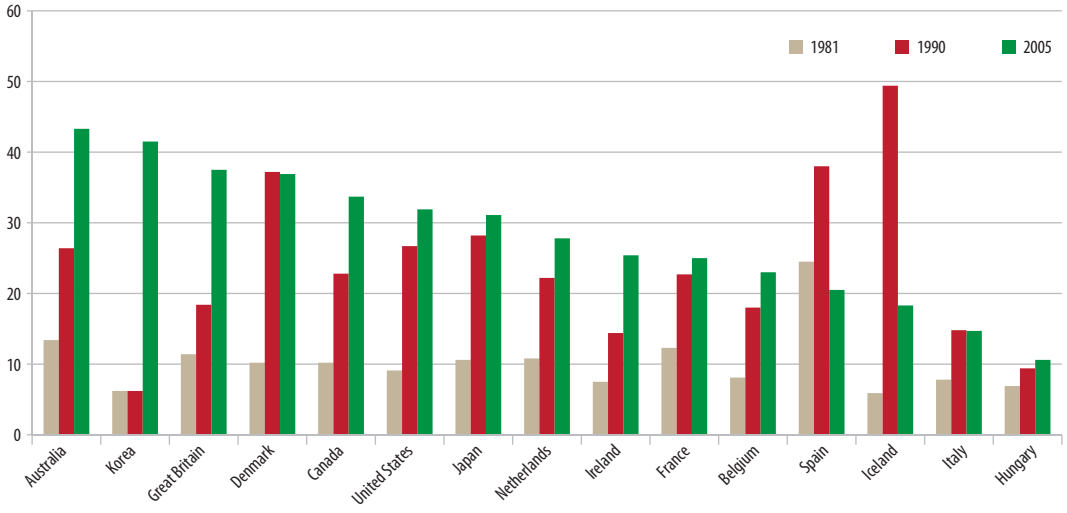
In most OECD countries permitting the comparisons, the proportion of populations who believe that "hard work" is an important quality in children has gone up since the early 1980s. Whether because we live in more competitive, achievement-oriented times or because there is greater belief in the meritocratic promise that talent plus hard work will translate into improved prospects, it seems that hard work in children is now valued more than in the early 1980s. The exceptions in the figure to this upward trend are the Czech Republic and Denmark, but their starting points are widely different: just under three-quarters endorse "hard work" in children as an important value in the Czech Republic compared with 2% in Denmark.

It is not only traditional values that are given greater priority but "post-materialist" ones as well. Imagination in children is also valued more than 20-30 years ago. In all the countries for which data is available, with the sole exception of Spain, the percentage of people who see imagination as important went up between 1981 and 2005, though 1990

was the peak year in some countries. As with hard work, the variation between countries is very large – from over 40% in Australia to just over 10% in Hungary. How far promotion of both hard work and imagination are compatible with one another is a matter for debate. It fits, however, with a more general pattern emerging from the World Values Survey findings: that we have rising expectations for children in general, finding more and more qualities important for them. The findings reported here may thus be part of the changing context and meaning of childhood in 21st century OECD societies, reinforced by smaller families with greater material resources for each child.

Figure 4.10. **"Children should have imagination"**

Percentage of respondents to the World Values Survey who believe that imagination is an important quality in children, in 1981, 1990 and 2005



StatLink http://dx.doi.org/10.1787/888932321492

Source: World Values Survey (2009), *Four-wave Aggregate of the Values Studies*.

And education?

- With rising expectations for children by parents and society, is it reasonable to expect schools to develop all desired attributes in every child? Is this possible?
- Imagination and creativity are commonly cited as among the "21st century competences". Should more be done in education to promote them? Should they be assessed?
- What role should be played by other sources of influence in shaping the norms and values of young people? Is too much expected of schools?

FIND OUT MORE

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The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Definitions and measurement

- *Marriage and divorce*: The data used here is crude marriage and divorce rates. Marriage rate is calculated by dividing the actual number of new marriages in each year by the total population. Similarly, the rate of divorce is calculated by dividing the number of marriages that legally end each year by the total population.
- *Single parent families*: Families where single parents live with their dependent children. Dependent children are all children under the age of 16 years and economically inactive people of 16 to 24 years of age, living in a household with one of their parents. Cohabiting couples, another growing family type, are no longer counted as single parents, at least in most countries.
- *Total fertility rates*: The total fertility rate is not something that is actually counted. It is not based on the fertility of any real group of women, since this would involve waiting until they had completed childbearing. Instead, it is calculated by imagining that a woman would go through her entire fertile life (15 to 49 years of age) with the fertility rate current in each specific age group. These levels are calculated by dividing the number of live births each year to women from each age group by the population of women in the same age group.
- *Obesity*: The Body Mass Index (BMI) is a measure of a person's weight taking their height into account. It can be used as a proxy for the proportion of body fat, although this is not at all what the index measures and the diversity of body shapes and muscular tone in the human population can make it inaccurate for this purpose in many people. BMI is calculated by the following: weight(kg)/height(m)^2. Based on the WHO's current classification, individuals with a BMI of between 25 and 30 are defined as overweight, while those with a BMI greater than 30 are considered obese.
- *Consumption of methylphenidate*: Methylphenidate is the active substance in the widely used, a medication prescribed for the treatment of ADHD. Levels of consumption are measured as defined daily doses per thousand inhabitants per day and calculated on the basis of statistics on manufacture and trade provided by Governments. In countries that do not manufacture and export methylphenidate, quantities declared as imported are considered to be destined for consumption. For countries with manufacture and exports of methylphenidate, the average annual manufacture is added to the average annual import and the average annual export is subtracted. Conclusions on the actual level of consumption of psychotropic substances should be drawn with caution, as data on manufacture and trade reported by Governments may not be complete.
- *Childhood poverty rates*: This data refers to the percentage of children aged less than 18 years who live in a family where the total income is less than 50% of the median income in their country. The median is the mid-point between the highest and lowest income levels in the population.

Chapter 5

ICT: The next generation

***Towards universal access**: the growing and often near-universal access to computers at home, and trend data on access to computers at school.*

***Where do students use computers?** Short-run trends based on PISA evidence on computer use by young people at home and at school.*

***The evolving World Wide Web**: the rapidly-expanded worldwide network, charted through millions of websites, as well as the growth of **Wikipedia** as an example of user-generated content.*

***Rapidly growing participation online**: trends in Internet use, including by young people.*

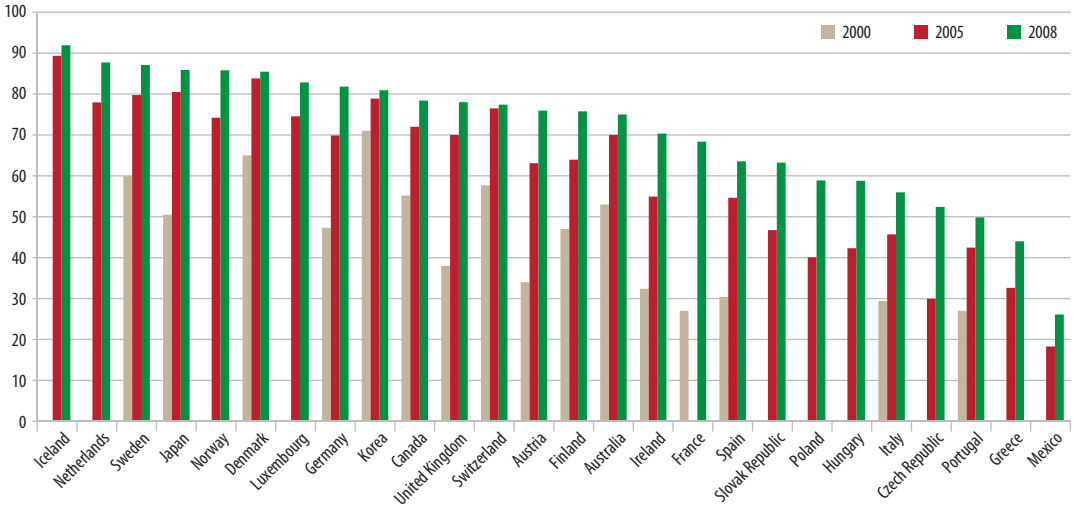
***The world in your pocket**: this section charts the soaring ownership of mobile phones and the rapidly-growing access to mobile broadband Internet.*

TOWARDS UNIVERSAL ACCESS

Information technology has developed very rapidly over the past 40 years, with computers becoming smaller, faster, cheaper, and more powerful. Information technology is now an integral part of our daily lives and embedded in many products. Many of us are now living in technological environments and need to adjust to the rapid pace of change. The ease and speed at which very large quantities of information can be rapidly accessed in a variety of settings is a key matter for education, as is the development of the skills necessary to use this resource effectively. While access to a computer at home has become almost universal in OECD countries, many questions remain about the use made of that technology for education, despite significant investments made by countries in order to provide access to computers and the Internet in schools.

Figure 5.1. **Growing access to home computers**

Households with access to a computer at home (including desktops, portables and handhelds), in 2000, 2005 and 2008



StatLink http://dx.doi.org/10.1787/888932321511

Source: OECD (2009), *OECD Key ICT Indicators*.

Home access to computers – including desktops, portable computers and handheld devices – grew rapidly in OECD countries from 2000 to 2008. There remain considerable differences between countries. By 2008, household access to computers reached more than 80% in nine OECD countries and was particularly high in Japan and Northern Europe. However, in Greece and Portugal and only half or less of the population have access to a computer at home, and in Mexico this figure is even lower again.

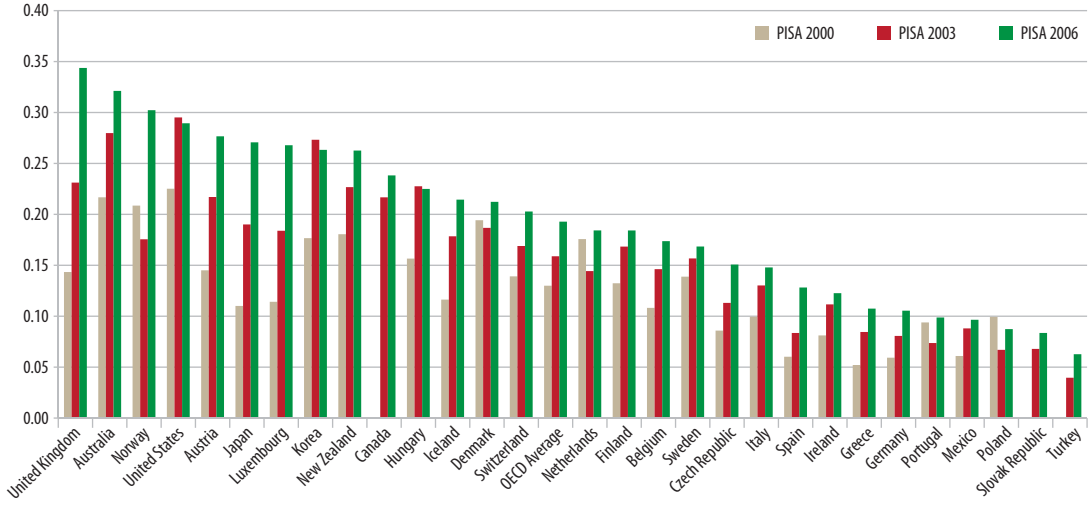
The information on student access to computers provided by schools as part of the triennial Programme for International Student Assessment (PISA) suggests that the penetration of technology in schools remains more limited. On average in OECD countries there was one computer available for every five children in 2006, up from one computer for every eight children in 2000. There is wide variation: in nine OECD countries there

was a computer available for at least every four students, while in five of them there was only one computer for ten children or more. But just as with home access, the presence of computer technology by itself says little about how it is actually used both in terms of time spent and for what purpose. High or low access in terms of computers in homes or schools gives an imprecise indication of technology use.

What is known about numbers of computers in schools and their use suggests that ICTs are not fundamentally transforming the environments or methods through which most young people learn. Research also shows that children learn ICT skills more through home use than school use, as well as spending more time using computers at home (see next section). There are continuing forms of the "digital divide" which are based not on access to technology but on the skills and capabilities to use it effectively. The fact remains, notwithstanding, that the contexts in which young people and older adults are living and working are far more technology-rich than they used to be.

Figure 5.2. **Increasing availability of computers at school**

Number of computers per student as reported by schools, in PISA 2000, 2003 and 2006



StatLink http://dx.doi.org/10.1787/888932321530

Source: OECD (2000, 2003 and 2006), *Programme for International Student Assessment (database)*.

And education?

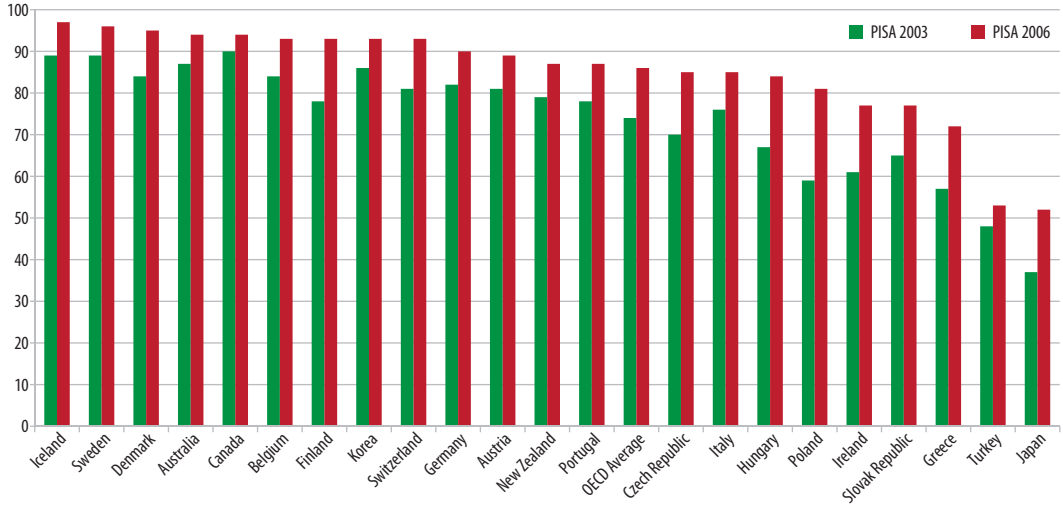
- With technological development continuing at a rapid pace, how well has education kept pace and, indeed, should it? What are the benefits and costs of students learning through technology?
- What are the effects on students of growing up in the digital age, and what are the implications for their capacities and needs as learners? Has teacher education and professional development met this challenge?
- Is the near universal household access to computer technology being adequately exploited for learning, whether by young people or by older adults?

WHERE DO STUDENTS USE COMPUTERS?

The availability of computers does not mean that they will be used. Rather, use is also dependent on the motivations and capacities of potential users, and the extent to which computers are present in both daily life and classroom practices. The data presented here indicate that very high percentages of young people have the motivation and capacity to use computers; the large majority of 15-year-olds frequently use computers at home. Use of computers in school is more limited, suggesting both that critical thresholds of equipment have not been reached and that there is a lack of thorough-going integration of computers into the learning process. Regardless of levels of either access or use, questions remain over the value gained from ICT for student learning.

Figure 5.3. **Computer use at home**

Percentage of 15-year-old students reporting frequent computer use at home, in PISA 2003 and 2006



StatLink http://dx.doi.org/10.1787/888932321549

Note: The number of students reporting frequent use includes all those who responded with either "almost every day" or "a few times a week".

Source: OECD (2010), *Are the New Millennium Learners Making the Grade? Technology Use and Educational Performance in PISA 2006*, Educational Research and Innovation.

Responses to the PISA survey show that "frequent" use of computers at home – meaning either every day or a few times a week – is now almost universal among 15-year-olds in OECD countries. Eighty percent or more of 15-year-old students report frequently using computers at home in 17 of the 22 countries shown, and in ten of these countries, the figure is over 90%. On the opposite end of the scale, in Japan and Turkey only around half report frequent computer use at home.

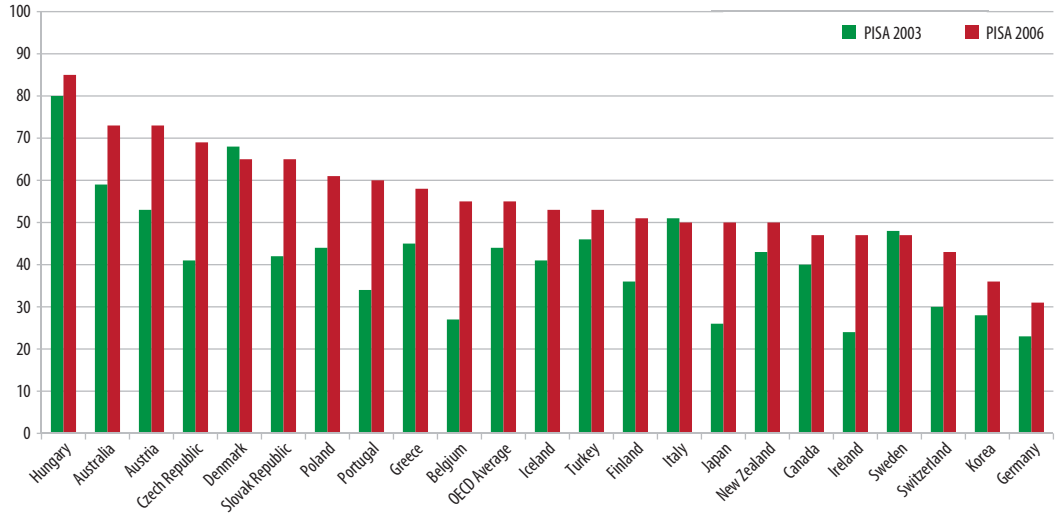
In contrast, the proportion of 15-year-olds reporting frequent use of computers at school is much lower. In 2006, just over half (55%) of students on average reported this, up from 44% in 2003. "Frequent" use of computers in schools rose in all the countries shown, except Denmark, Italy and Sweden. In 2006, in only three countries (Australia, Austria

and Hungary) do 70% or more of the students report that they use a computer frequently in school.

"Access" is not the same as "use", and neither is the same as "productive use". Almost universal access and use of computers at home by young people in OECD countries suggests that the more pertinent digital divide is now between those who can take advantage of the opportunities that computers offer and those who cannot, with those who already possess high levels of human capital in the best position to increase that capital using ICT. This also suggests that schools remain important in addressing the inequalities reinforced by such digital divides.

Figure 5.4. **Computer use at school**

Percentage of 15-year-old students reporting frequent computer use at school, in PISA 2003 and 2006



StatLink http://dx.doi.org/10.1787/888932321568

Note: The number of students reporting frequent use includes all those who responded with either "almost every day" or "a few times a week".

Source: OECD (2010), *Are the New Millennium Learners Making the Grade? Technology Use and Educational Performance in PISA 2006*, Educational Research and Innovation.

And education?

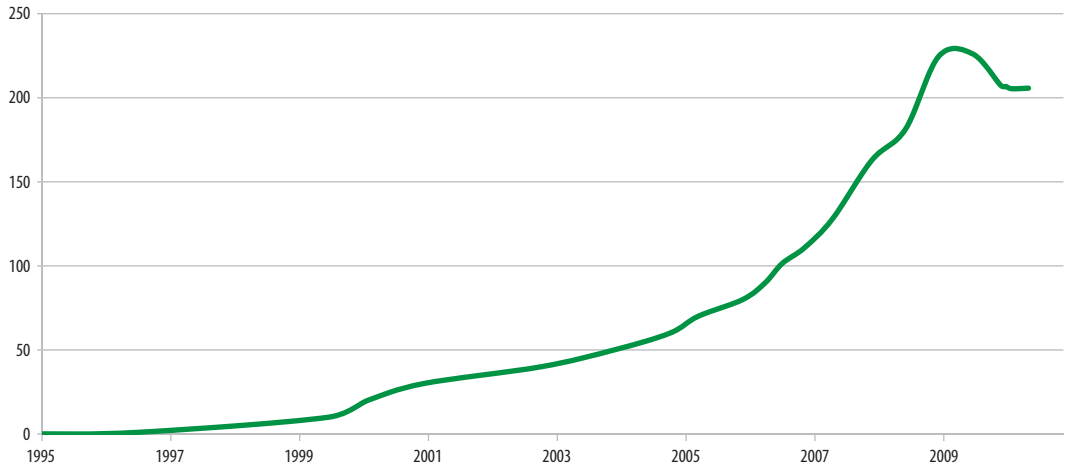
- In comparison with ICT in homes, its use in schools is more limited. Should ICT be better integrated into the learning process and, if so, how?
- Not all learners have the same capacity to take advantage of the opportunities ICT offers. How can education help to level the playing field?
- ICT has the potential to allow more self-paced, interactive and personalised learning. How much more should this potential be exploited, whether in schools, vocational or higher education, or non-formal learning for adults?

THE EVOLVING WORLD WIDE WEB

The Internet represents far-reaching, rapid technological development with a multitude of implications for society. It has enabled very significant applications like email exchange and the World Wide Web, as well as other services such as online banking, shopping, multi-media entertainment, and audio and video communication. The more recent introduction of platforms to host user-generated content (known as Web 2.0) have made the Internet a participatory activity, thereby setting it apart from the traditional forms of media that can only be consumed. The immediate challenges for education are much less about student competence or motivation to engage with the Internet, and more about harnessing its vast potential to enhance learning and developing critical capacities for its use. In the longer term, the availability of information and ease of interaction prompts far-reaching questions about what it means to be educated, and what skills are needed to harness collective capabilities.

Figure 5.5. **Growing number of websites worldwide**

Number of websites (in millions), 1995-2010



StatLink http://dx.doi.org/10.1787/888932321587

Source: Netcraft (2010), *Netcraft Web Server Surveys*.

The Internet has expanded rapidly in the past decade. From nearly 19 000 in 1995, the number of websites online has mushroomed to around 226 million in 2009. More than 90% of this growth took place since the year 2000. In the year to July 2010, for the first time the number of websites declined to 205 million, probably because of the large numbers of blogs that had been started but not maintained. Nonetheless, the trend has still been impressively upward since the beginning of the decade.

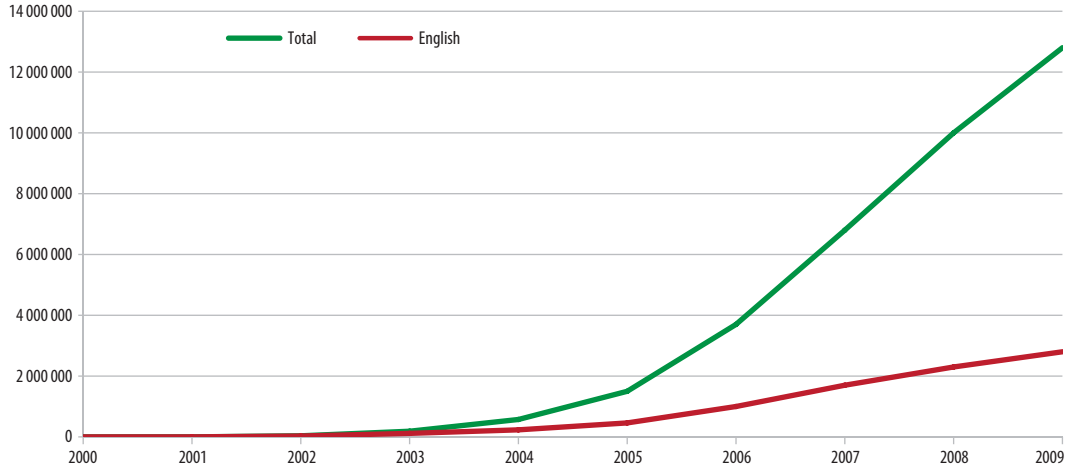
The expansion of the Internet has brought an explosion of easily accessible information on the World Wide Web. In the early years, most websites provided access to essentially static information through text and images. In more recent years, user-generated content has become a central element of the World Wide Web. This can take many forms, ranging from sharing short movies (*Youtube*) and pictures (*Flickr*), to interactive social

or professional networking (*Facebook, MySpace*), to the creation of content management systems called "wikis" (*Wikipedia*, *WikiTravel*, *Wiktionary*). Blogs are another online tool for user-generated content; they come in many forms for many purposes, some are very personal while others are very public and sometimes influential.

Wikipedia, the most widely known and used wiki, is a project where many thousands of authors are together creating an online encyclopaedia. They can add, remove, and otherwise edit content collectively, the idea being that the sheer numbers of users reading the articles should ensure that content is edited and mistakes corrected. Like many other websites supporting user-generated content, *Wikipedia* has grown extremely quickly since it began early in the 2000s to boast more than 12.8 million entries by 2009. At the beginning, it was primarily in English, but by 2009 over three-quarters of the entries were in one of more than 250 other languages, and together these are growing much more rapidly than those in English.

Figure 5.6. **Rapid growth of Wikipedia**

Number of Wikipedia articles (total and English language articles), 2000-2009



StatLink http://dx.doi.org/10.1787/888932321606

Source: Wikipedia (2010), *Wikipedia Statistics*.

And education?

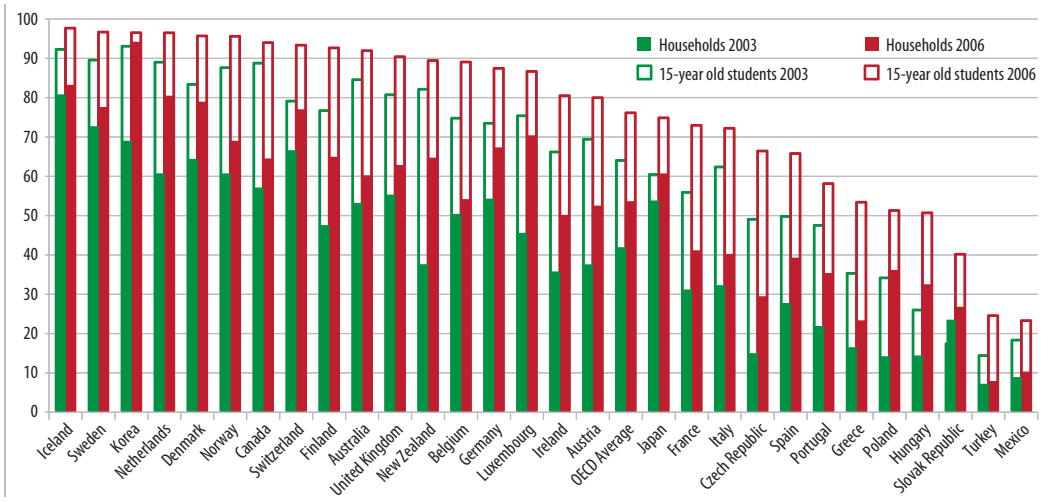
- There has been a dramatic growth in the amount of information available and the ease with which anyone can upload materials. How can educators develop their students' critical capacity to use and contribute to this wealth of information?
- With the increase of user-generated content on the Internet, what can its participatory and collaborative models bring to formal learning systems?
- Enormous amounts of information can now be freely searched using key words and hypertext. Is this affecting established modes of knowledge organisation – for example, disciplinary boundaries or common sequences for learning material?

RAPIDLY GROWING PARTICIPATION ONLINE

Information and communication technology (ICT) is now an integral part of our societies and daily lives at home, at school and at work. It has transformed such diverse matters as the way we work and relax, how businesses operate, the conduct of scientific research, the ways that governments govern, and how we stay connected with others. However widespread, they are often controversial, for instance as regards the quality of some online material and of social connectivity using these means. Education is both influenced by and a source of influence on these questions: the Internet opens up new learning and communication possibilities but also the acquisition of "digital literacy" becomes still more pressing for young people and older adults, so that they may engage with digital materials and pursue their possibilities in an informed way.

Figure 5.7. **Growing access to the Internet, especially in households with children**

Percentage of 15-year-olds reporting an Internet connection at home and the percentage of all households with Internet access, in 2003 and 2006



StatLink http://dx.doi.org/10.1787/888932321625

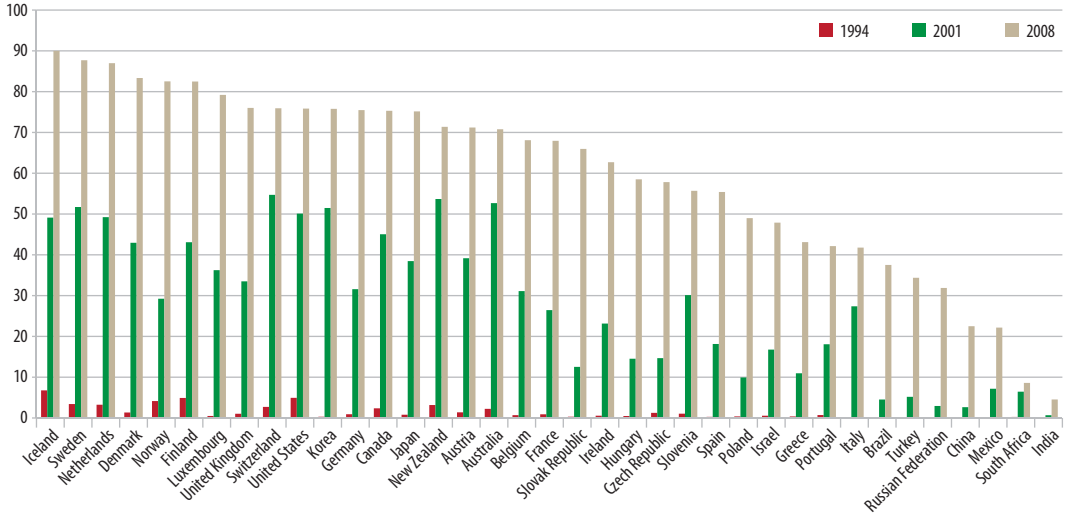
Source: OECD (2010), *Are New Millennium Learners Making the Grade? Technology Use and Educational Performance in PISA 2006.*

Home access to the Internet is increasingly widespread. Over half of households on average across the OECD countries (53%) had access to the Internet in 2006, up from 42% in 2003. In Iceland, Korea and the Netherlands, over 80% of households had access to the Internet at home in 2006. Households with teenage children are even more likely to have Internet access at home. In the PISA surveys, over three-quarters of 15-year-old students reported having Internet access at home in 2006, compared with 64% in 2003. Among families with 15-year-old students, there are many countries where access to the Internet is over 85%. The greatest access is in Iceland, Korea and Sweden, with lowest access in Mexico, the Slovak Republic and Turkey (at around 40%, 25% and 23% respectively). Since 2006, household access has continued to increase.

While access is part of the picture, the pervasiveness of the Internet can also be illustrated by the numbers of users in each country. The figure below shows that more than 80% of the population use the Internet in Denmark, Finland, Iceland, Norway, the Netherlands, Sweden and another 11 countries, *i.e.* between 70% and 80%. Such high levels contrast markedly with China, India, Mexico and South Africa, where less than 25% of the population are online. The most striking feature of this graph is the change in each country in the last 15 years, even in the last decade. Since 2001, the proportion of the population using the Internet more than tripled in Hungary, Poland and the Slovak Republic, and increased more than five times in Brazil, China, India and Turkey. Nearly ten times more people in the Russian Federation were online in 2008 compared with 2001.

Figure 5.8. **Towards universal Internet use**

Number of Internet users per 100 population, in 1994, 2001 and 2008



StatLink http://dx.doi.org/10.1787/888932321644

Source: International Telecommunication Union (2009), *World Telecommunication Development Database*.

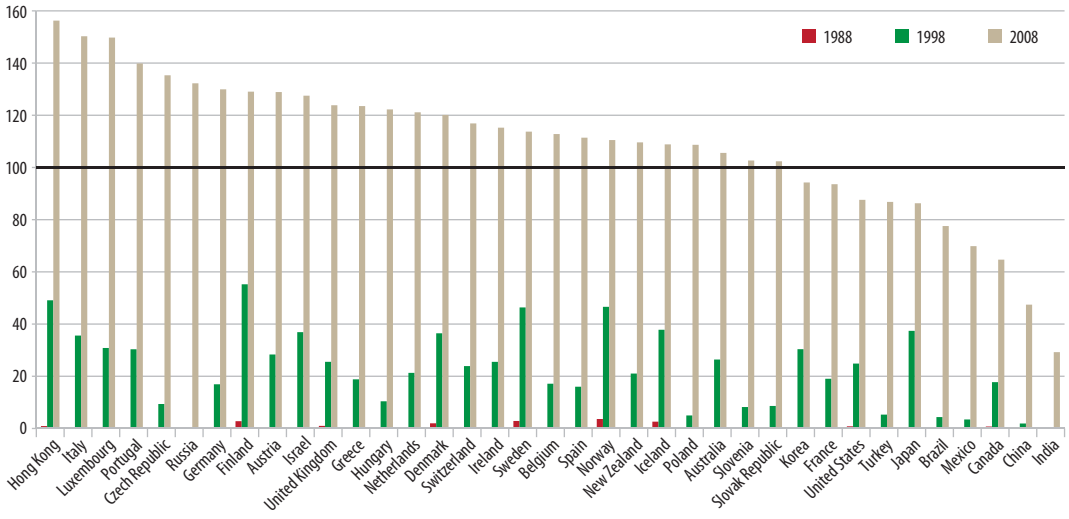
And education?

- Where should the balance be drawn between incorporating such rapidly-changing Internet possibilities into learning, on the one hand, and laying the personal and social foundations for dealing with such rapid change, on the other?
- Does the pervasiveness of the Internet mean that society is now becoming "de-schooled" decades after the original arguments were made by those opposed to the bureaucratic tendencies of education systems?
- There are a number of fields of expertise, such as command of html language, required to engage fully in the creation of online materials. Should these be considered pre-requisite skills for all citizens and are enough people with advanced skills being trained through vocational programmes?

THE WORLD IN YOUR POCKET

Before most educators had the chance to grasp fully the implications of computing and the Internet for student learning, another technology had been introduced that is further transforming the way we access information, do business, entertain ourselves and communicate with each other. Mobile phones have been around since the late 1980s, but it is only in the last ten years that they have become almost universally owned and with so many functions as to begin to rival the average desktop computer. Numerous other portable devices now allow email and Internet access. Since the introduction of 3G services, worldwide use of mobile broadband has increased faster than the growth in fixed line internet. It has profound implications for education when students have access to all the information available online, as well as the ability to communicate and collaborate around the world at anytime, using a handheld device that fits in their pockets.

Figure 5.9. **Towards universal use of mobile phones**
Number of mobile phones per 100 population, in 1988, 1998 and 2008



StatLink http://dx.doi.org/10.1787/888932321663

Note: The solid line at 100 mobile phones indicates the point at which there are enough in use for every single person in that country to have one.

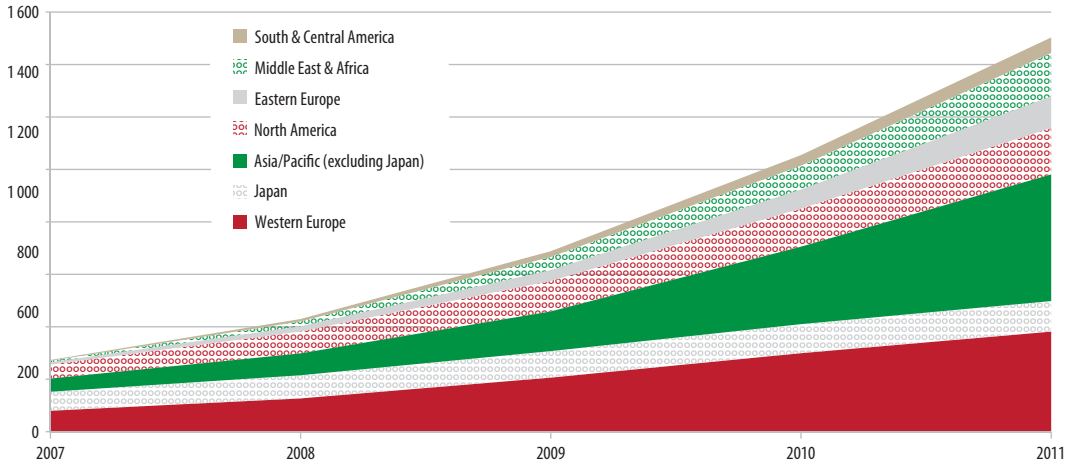
Source: United Nations Statistics Division (2009), *UNdata*.

In the late 1980s, mobile phones were a very new technology owned only by the rich. By the turn of the century, more than 20% of the population in 18 OECD countries owned at least one. In Finland, already by 1998 there were enough active mobile phones for 55% of the population. But, the most rapid growth has occurred in the decade since then. By 2008, there were more active mobile phones than people in 27 of the 37 countries shown in the figure. As not everyone possesses one (including babies and many of the elderly) this means that in many countries a large number of people are now actively using more than one mobile phone. Some of the countries with the highest rates of ownership now were not among the mobile phone "leaders" a decade ago; certain others with relatively high ownership a decade ago, such as Canada and Japan, are now well down the list.

Subscriptions to 3G services through which people can use mobile broadband on phones and other portable devices have also increased in recent years. Figure 5.10 shows a very marked increase in subscribers to 3G since 2007 in all world regions, especially in Western Europe and the Asia Pacific. The projections foresee this growth continuing over the medium term, altogether amounting to an approximately five-fold increase to 2011.

Figure 5.10. **Expanding use of mobile broadband**

Number of global subscribers to 3G services, including WCDMA, HSPA and TD-SCDMA (in millions), 2007-2011



StatLink http://dx.doi.org/10.1787/888932321682

Note: Data for 2009 onwards are estimates.

Source: Morgan Stanley (2009), *Global: The Mobile Internet Report*.

And education?

- Many students have access to pocket-sized portable devices connected to the World Wide Web, permitting endless possibilities for information access and communication. How does this affect conventional notions of curriculum, assessment and examinations? Should it?
- How is the importance of physical presence in learning institutions changing now that learners have such extensive access to the Internet from home and from portable devices?
- Young people's lives are immersed in technology to a point where it is part of their identity. What are the advantages and disadvantages of this when it comes to learning? Where does it leave those education institutions using such technologies much less?

FIND OUT MORE

Relevant sources

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The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Definitions and measurement

- *The Programme for International Student Assessment (PISA)*: This programme is an internationally standardised assessment that was jointly developed by participating economies and administered to 15-year-olds in schools. In addition, data is gathered on the school environment through an accompanying school survey. Four assessments have so far been carried out (in 2000, 2003, 2006 and 2009). Data for the assessment which took place in 2009 will be released on 07 December 2010. Tests are typically administered to between 4 500 and 10 000 students in each country.
- *Website*: A set of interconnected web-pages, usually including a homepage, generally located on the same server, and prepared and maintained as a collection of information by a person, group, or organization (from *The American Heritage Science Dictionary*).

- *Broadband*: This type of Internet connection is characterised by download speeds of at least 256kbits/second.
- *3G services*: Since the first mobile services were provided in the early 1980s, the quality of service provided has improved dramatically, particularly in terms of speed and coverage. The development is marked by standards set by the International Telecommunications Union, a United Nations agency. Each progression of standards is referred to as a generation. In most OECD countries, networks meet 3G, third generation, standards for mobile services. 3G is the first generation of mobile networks required to provide mobile broadband that can be used by mobiles, portable devices and laptops.

OECD PUBLISHING, 2, rue André-Pascal, 75775 PARIS CEDEX 16
PRINTED IN FRANCE
(96 2010 04 1 P) ISBN 978-92-64-07526-9 – No. 57575 2010

Trends Shaping Education 2010

What does it mean for education that our societies are increasingly diverse? How is global economic power shifting towards new countries? In what ways are working patterns changing?

Trends Shaping Education 2010 brings together international evidence to address questions like these. To make the content accessible, each trend is presented on a double page, containing an introduction, two charts with brief descriptive text and a set of pertinent questions for education.

The trends presented are based on high quality international data, primarily from the OECD, the World Bank and the United Nations. The charts contain dynamic links so that readers can access the original data. *Trends Shaping Education 2010* is organised around five broad themes, each with its own "find out more" section:

- the dynamics of globalisation;
- evolving social challenges;
- the changing world of work;
- transformation of childhood;
- ICT: the next generation.

This book is designed to give policy makers, researchers, educational leaders, administrators and teachers a robust, non-specialist source to inform strategic thinking and stimulate reflection on the challenges facing education, whether in schools, universities or programmes for older adults. It will also be of interest to students and the wider public, including parents.

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ISBN 978-92-64-07526-9
96 2010 04 1 P