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PROGRESS TOWARDS THE LISBON OBJECTIVES IN EDUCATION AND TRAINING
Indicators and benchmarks
2008

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Preface

“Progress towards the Lisbon objectives in education and training” is the 5th annual report examining performance and progress under the Education and Training 2010 Work Programme.

The purpose of this report is to provide strategic guidance for the Education and Training 2010 Work Programme on the basis of indicators, benchmarks and research results. The report sets out progress towards the objectives agreed by the Council. The Progress Reports for 2004, 2005, 2006 and 2007 were able to give more and more detailed analysis of performance and progress as data and research material became available.

On 25th May 2007 the Education Council adopted conclusions on a coherent framework of 16 core indicators for monitoring progress towards the Lisbon objectives in education and training (European Council, 2007a). The 2007 and 2008 Reports have used these core indicators, reinforced by contextual data and research results.

Reflecting these indicators and the political priorities of the Education and Training 2010 programme, the main part of the 2008 report (Part B.) is structured in eight chapters as follows:

1. Making lifelong learning a reality
2. Developing school education
3. Developing vocational education and training
4. Developing higher education
5. Key competences for lifelong learning
6. Improving equity in education and training
7. Employability
8. Investment in education and training;

The Report indicates the direction in which European education systems are moving and how their contribution towards meeting Europe's Lisbon objectives is developing.

World beating performance is found within some areas of EU education and training. At the same time, many Member States are challenged in particular fields. The Report shows that the best policy practice already existing within the EU could add value if it could inspire more general improvement. The Report helps point to the scope for exchanging information and policy experience. It also points to the scope for further improving the framework of indicators and benchmarks which underpins it.

The report was prepared by the Directorate-General for Education and Culture, CRELL (the lifelong learning research unit in the Joint Research Centre) and Eurostat, in cooperation with, the Eurydice European Unit.

PART A	Performance and progress of European education and training systems since 2000
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- 1. The policy framework – The Lisbon strategy**
- 2. Progress towards five benchmarks for 2010**
- 3. Best performing countries: Learning from good practice**
- 4. European Educational systems in a Worldwide perspective**

MAIN MESSAGES 2008

- Performance of the European Union in education and training levels with the best in the World such as Australia, New Zealand, Canada, US and Korea. However the overall performance of the EU masks wide divergence between Member States.
- 60% of 5-29 years old participate in schools and higher education. This is comparable to the US and 18% higher than in Japan.
- There are about 3 million more students in higher education and 1 million more graduates per year than in 2000.
- There are 13 million more higher education graduates in the working age population than in 2000.
- Almost 108 million people still have low educational attainment - about 1/3 of the labour force.
- There are still important inequities in European educational systems.
 - 6 million young people, 1 in 7 of 18-24 years old, achieve only compulsory education or less.
 - 25-64 year-olds are 3 times more likely to participate in lifelong learning if they have completed at least upper secondary education.
 - 1 in 7 of the 4 year-olds are not enrolled in education. Many of these are in high need categories, such as children with migrant background or from families with low socio-economic status.
 - Gender inequalities remain. Boys do less well at reading and have more special education needs. Girls do less well at mathematics and are underrepresented among mathematics, science and technology students and graduates.
- The EU set itself the overall ambition of achieving 5 benchmarks by 2010, on literacy, reduction of early school-leaving, upper secondary attainment, maths, science and technology graduates and participation in adult learning. Only the benchmark on mathematics, science and technology graduates is likely to be exceeded. Indeed, low performance in reading literacy, which was benchmarked to decline by 20% by 2010, has actually increased by more than 10% between 2000 and 2006 and has reached 24.1 %.
- Education and training in the EU is improving slowly but steadily. Yet there are significant divergences between Member States and fields.
 - All countries have relative strength and weakness in the five benchmark areas.
 - Finland, Denmark, Sweden, the United Kingdom, Ireland, Poland, Slovenia, Norway and Iceland exceed the composite objective of the five benchmarks set for 2010 and are progressing in yearly averages; while France, the Netherlands, Belgium, have average performance below the composite objective and have not made progress.
 - Participation in lifelong learning is becoming a reality in Sweden, the United Kingdom, Denmark, Norway and Iceland, countries which have developed comprehensive and coherent lifelong learning strategies. Slovenia, Finland, Austria, Belgium and Spain are following closely behind.

1. The policy framework - the Lisbon strategy

Education and training have an important place in the integrated guidelines for delivering the revised Lisbon strategy for jobs and growth.

As part of this overall strategy, the Council set out broad common objectives for the education and training systems of the EU. The Education and Training 2010 Work Programme supports the actions of the Member States to achieve these objectives. It is implemented through the open method of coordination, using indicators and benchmarks to support evidence-based policy making and to monitor progress.

The Council in May 2007 identified a framework of 16 core indicators for monitoring progress towards the Lisbon objectives.

Sixteen core indicators for monitoring progress towards the Lisbon objectives

- Participation in pre-school education
- Special needs education
- Early school leavers
- Literacy in reading, mathematics and science
- Language skills
- ICT skills
- Civic skills
- Learning to learn skills
- Upper secondary completion rates of young people
- Professional development of teachers and trainers
- Higher education graduates
- Cross-national mobility of students in higher education
- Participation of adults in lifelong learning
- Adult skills
- Educational attainment of the population
- Investment in education and training

These indicators enable the Commission and the Member States to:

- underpin key policy messages;

- analyse progress both at the EU and national levels;
- identify good performance for peer review and exchange; and
- compare performance with third countries.

In order to guide progress on the Education and Training 2010 Work Programme, the Council adopted 5 benchmarks to be achieved by 2010.

Five EU benchmarks for 2010

- No more than 10% early school leavers;
- Decrease of at least 20% in the percentage of low-achieving pupils in reading literacy;
- At least 85% of young people should have completed upper secondary education;
- Increase of at least 15% in the number of tertiary graduates in Mathematics, Science and Technology (MST), with a simultaneous decrease in the gender imbalance;
- 12.5% of the adult population should participate in lifelong learning.

The core indicators cover the whole learning continuum from pre-school to adult education, teachers' professional development and investment in education and training.

Not all the data for these indicators are fully available yet. In most of these areas, new surveys are being prepared.

Indicators never tell the full story. But they help to identify differences, similarities and trends and to provide a starting point for further analysis in order to understand better performance and progress.

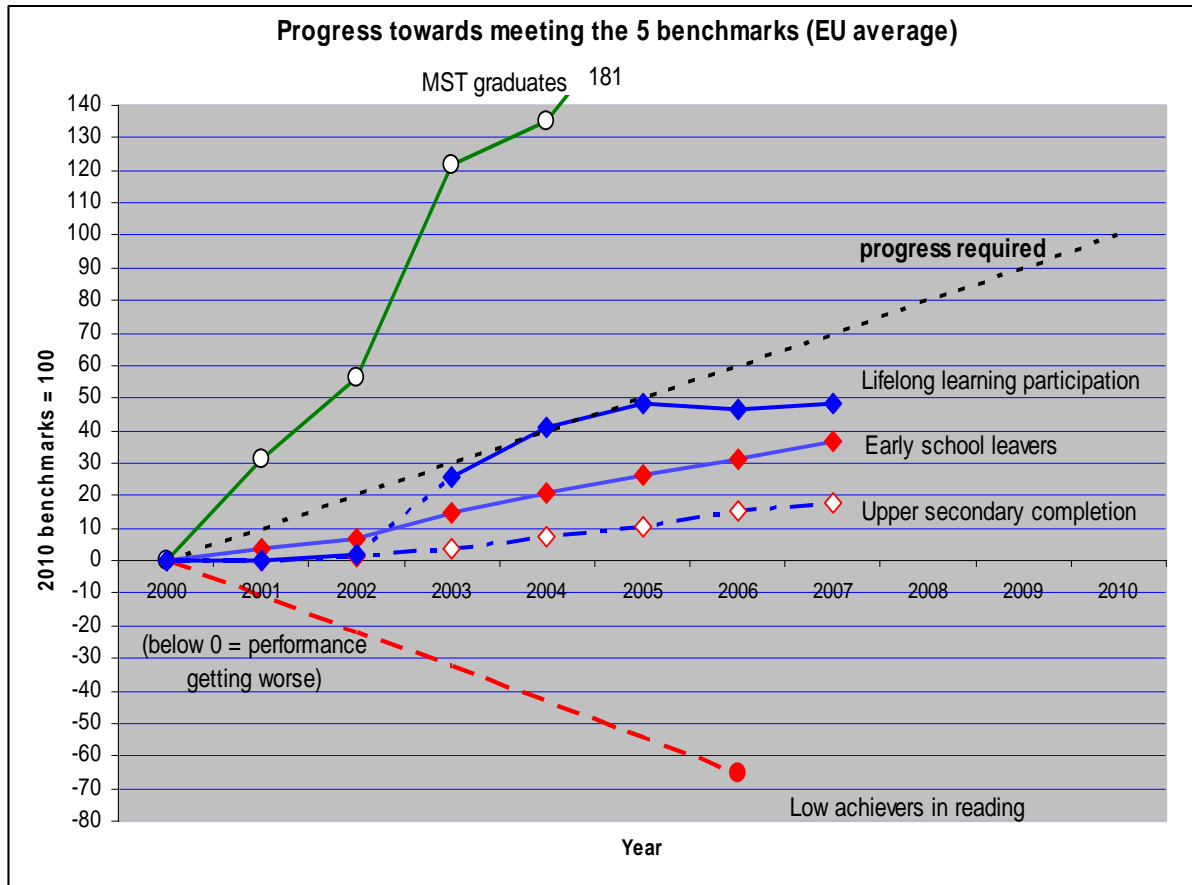
2. Progress towards five benchmarks for 2010

Education and training systems in the EU are generally improving. The EU benchmark on mathematics, science and technology graduates was already reached in 2005. Yet although

there is broad progress, attaining the benchmarks on early school leaving, completion of upper secondary education and lifelong learning will need more effective

national initiatives. Indeed, the situation is getting worse for reading literacy of young people, the benchmark in the field of key competences. (Chart A.1.)¹

Chart A.1 Progress towards meeting the five benchmarks for 2010 (EU average)



Source: DG Education and Culture

In this chart the starting point (in 2000) is set at zero and the 2010 benchmark at 100. The results achieved each year are measured against the 2010 benchmark (= 100). The diagonal line shows the progress required, i.e. an additional 1/10 (10%) of progress towards the benchmark has to be achieved each year to reach the benchmark. If a line stays below this diagonal line, progress is not sufficient; if it is above the diagonal line progress is stronger than what is needed to achieve the benchmark. If the line declines, the problem is getting worse.

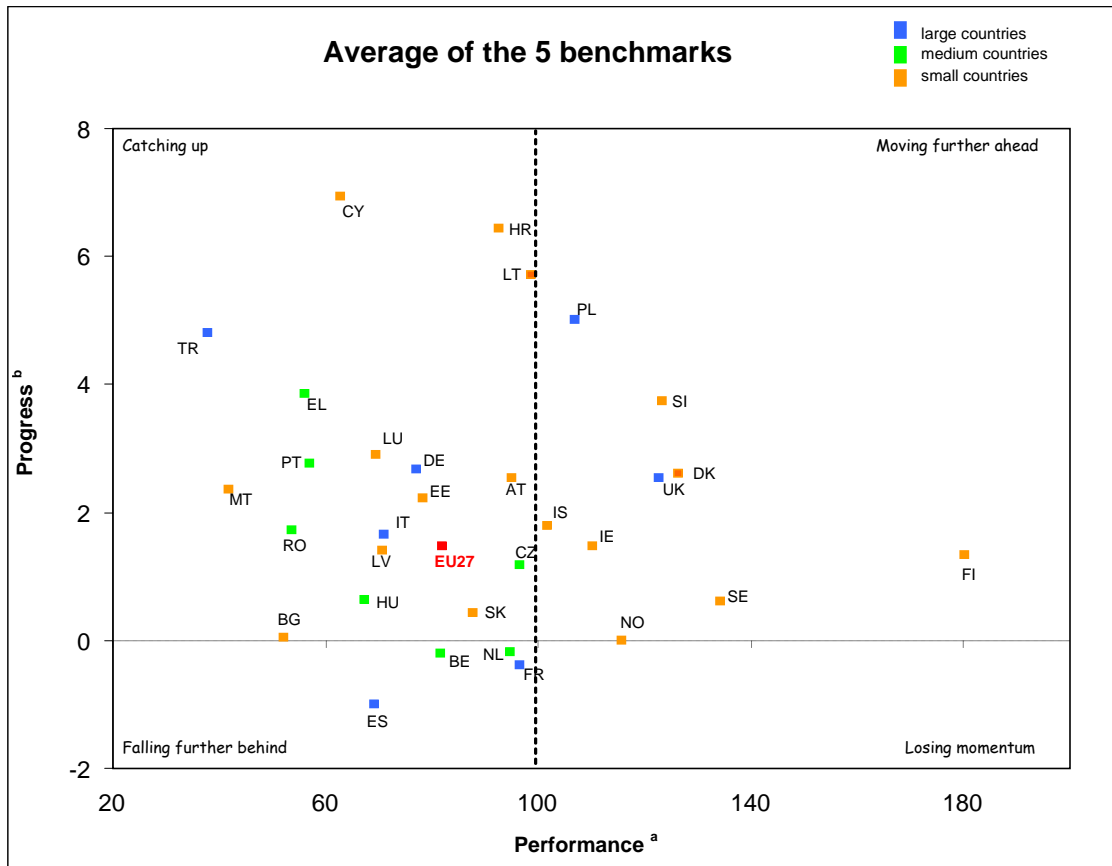
In the case of lifelong learning, it should be kept in mind that there have been many breaks in the time series, which tend to overstate the progress made, especially in 2003. Therefore the 2002-2003 line on LLL participation is dotted. For low achievers in reading (data from the PISA survey) there are results for 18 EU countries for only two data points, 2000 and 2006. It is therefore not yet possible to assess to what extent the observed differences are indicative of longer-term trends

Chart A.2 gives an overview of the average performance levels and progress of countries across the 5 benchmark areas (giving them equal weights). Most countries are progressing: their overall performance in the benchmark areas is improving. Finland, Sweden, Denmark, the United Kingdom, Ireland, Poland Slovenia, Norway and Iceland are

pulling further ahead. However 4 countries, France, the Netherlands, Belgium and Spain, have an average performance across the five benchmarks areas below the 2010 targets and are falling behind.

A more detailed analysis of each of the five benchmark areas is provided in Charts A.3 to 7.

Chart A.2 : Average levels of country performance (2006) and progress (2000-2006) across the five benchmark areas



Source : CRELL/Joint Research Centers 2008

Benchmark for 2010= 100 (Performance)

^a Average Performance (2006)

^b Average annual growth (2000-06) %. (Average yearly growth across the five benchmarks)

In the case of the indicators on low achievers and Early school leavers the average growth rate is multiplied by (-1) to take into account that a negative growth rate is a plus for the country.

Average country performance and progress (2000-2006) (Chart A 2)

The quadrant: "Moving further ahead" includes countries that have performance levels in 2006 above the composite 2010 target, and have been progressing (yearly average) during the period. The quadrant: "Falling further behind" includes countries that in 2006 have performance below the 2010 composite target and have negative average levels of progress during the period. Performance and progress of countries in each of the benchmark areas are shown in the graphics A.3-7.

The following indicators have been applied (Chart A.2-7)

Low achievers: Percentage of pupils with reading literacy proficiency level 1 and lower on the PISA reading literacy scale

Early school leavers: Share of 18-24 year-olds with only lower secondary education or less and not in education or training

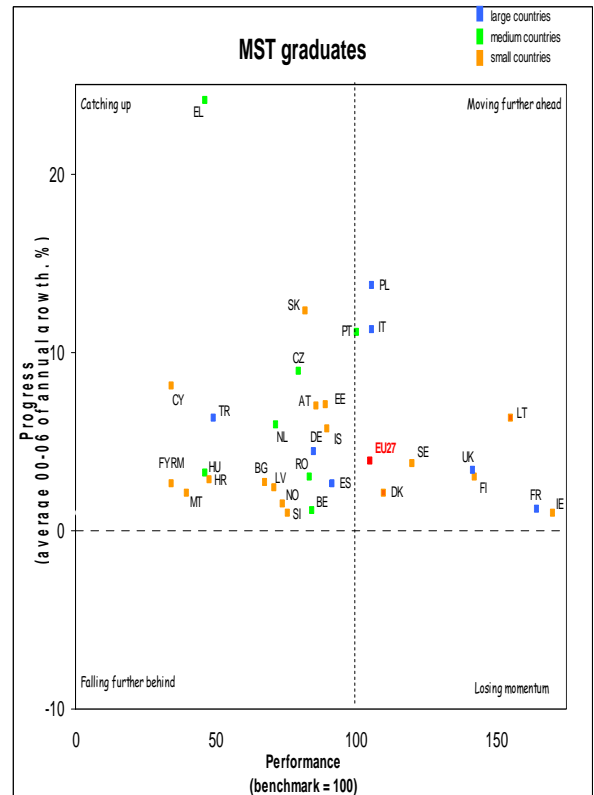
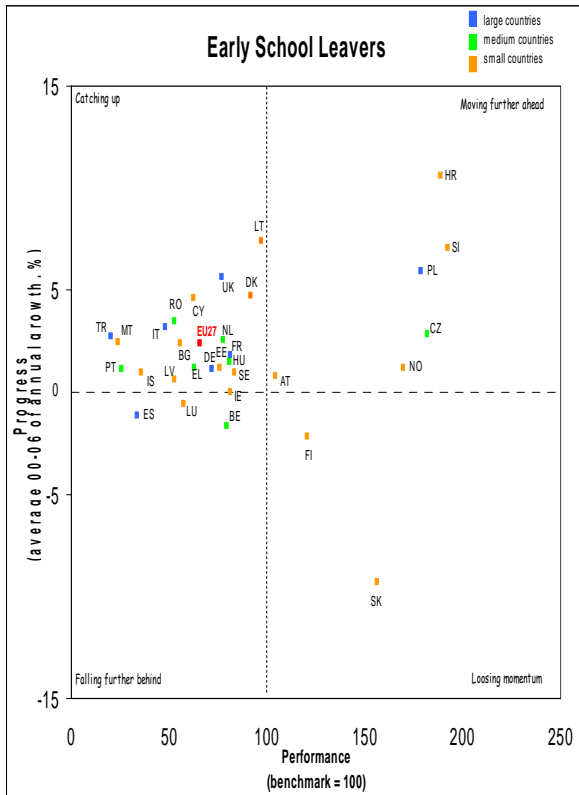
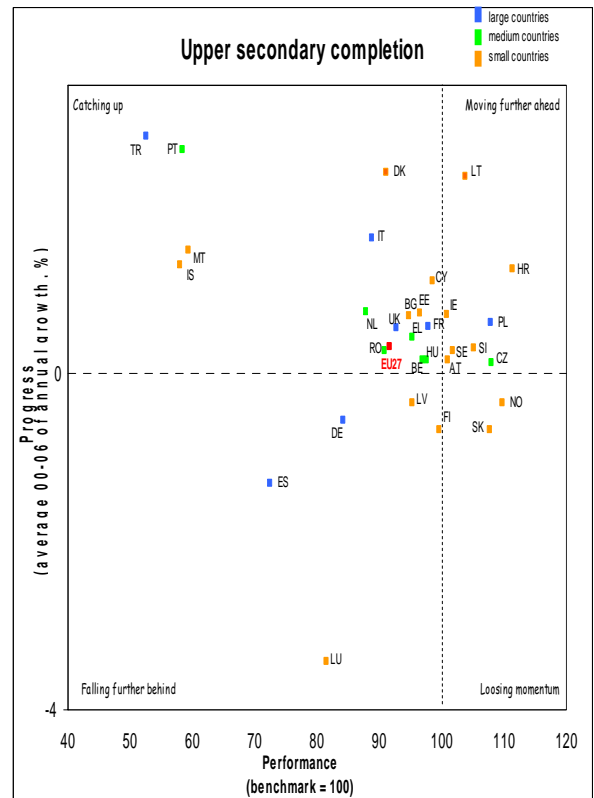
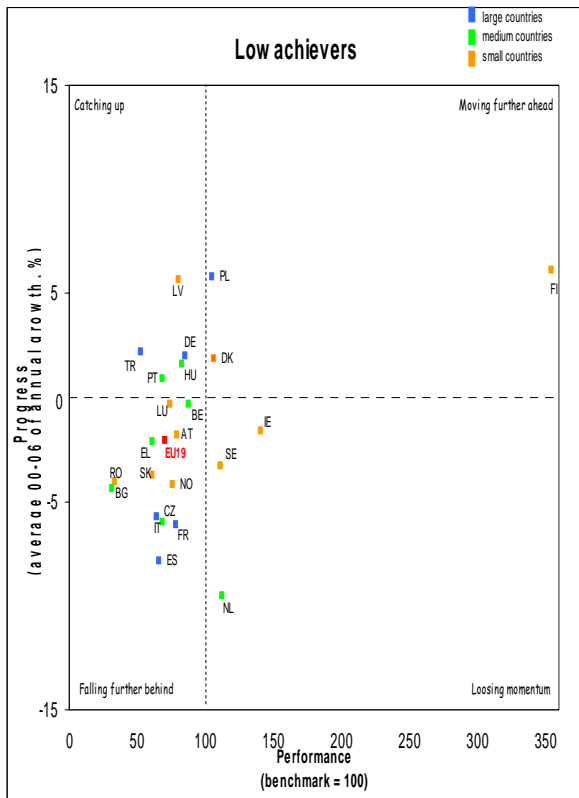
Upper secondary completion: Percentage of 20-24 year-olds with at least upper secondary education

MST graduates: Total number of MST graduates / per 1000 of the population, 20 – 29 year-olds.

Life long learning participation: Percentage of population aged 25-64 year-olds participating in education and training in the four weeks prior to the survey.

Sources: Eurostat (UOE, LFS); OECD/PISA

Charts A.3-7 Country performance (2006) and progress (2000-2006) in all five benchmark areas



further ahead in four of the five areas and that Austria, Denmark, Finland, Slovenia and

Sweden show that level of performance and progress in three areas.

Chart A.8 Country performance progress in each Benchmark area

	<i>Early school leavers</i>	<i>Lifelong learning</i>	<i>Upper secondary education</i>	<i>MST Graduates</i>	<i>Low performers in reading literacy</i>
EU					
Belgium					
Bulgaria					
Czech Republic					
Denmark					
Germany					
Estonia					
Ireland					
Greece					
Spain					
France					
Italy					
Cyprus					
Latvia					
Lithuania					
Luxembourg					
Hungary					
Malta					
Netherlands					
Austria					
Poland					
Portugal					
Romania					
Slovenia					
Slovakia					
Finland					
Sweden					
United Kingdom					
Croatia					
Turkey					
Iceland					
Norway					

Legend :

	ABOVE EU BENCHMARK	BELOW EU BENCHMARK
INCREASING PERFORMANCE	MOVING FURTHER AHEAD	CATCHING UP
DECREASING PERFORMANCE	LOOSING MOMENTUM	FALLING FURTHER BEHIND

3. Best performing countries: Learning from good practice

All Member States can learn from the best performers in the Union. Therefore it is important to complete the above analysis by looking at the details in the benchmark areas and in other core indicator areas (See Tables A.9 to 11).

This is why the Council asked for the three best performing countries (leaders) in specific policy areas to be identified. Half the Member States are leaders in at least one benchmark area. There is quite a spread of good practice and expertise in the EU. Three more countries are among the leaders on investment in human resources and pre-school participation, core indicators for which the Council set targets.

Table A.9: Best performing countries on benchmark relating to school education (2007)

	Target for 2010	Best performing countries in the EU			EU	USA	Japan
Low-achievers in reading (15-year-olds, %)	At least 20% decrease	Change in the percentage of low achievers in % (2000-2006)					
		Finland ^a -31.4%	Poland -30.2%	Latvia -29.6%	+13.1%	-	+82.2%
		Share of low achievers ^a					
		Finland 4.8%	Ireland 12.1%	Estonia 13.6%	24.1%	-	18.4%
Early school leavers (18-24) %)	No more than 10%	Poland 5.0%	Czech Rep. 5.5% ^a	Slovakia 7.2%	14.8%	-	-
Upper secondary attainment (20-24, %).	At least 85%	Czech Rep. 91.8%	Poland 91.6%	Slovenia 91.5%	78.1%	-	-

^a: 2006;

Source: DG education and culture

Data sources: Eurostat UOE and LFS; OECD/Pisa

Table A.10: Best performing countries on benchmarks relating to higher education and lifelong learning

	2010 target for EU	Best performing countries in the EU			EU	USA	Japan
Graduates in Mathematics Science Technology (per 1000 young people)	Increase of at least 15% graduates	Average annual increase 2000-2005					
		Poland +13.7%	Slovakia +12.3%	Portugal +13.1%	+4.7%	+3.1%	-1.1%
		MST Graduates per 1000 inhabitants (aged 20-29) in 2006					
		Ireland 21.4	France 20.7	Lithuania 19.5	13.0	10.3	14.4
		% of female graduates in 2006					
		Estonia 42.9 %	Bulgaria 41.2 %	Greece 40.9 %	31.3 %	31.3 %	14.6 %
Lifelong Learning participation (25-64, %)	At least 12.5%	2007					
		Sweden 32.0 (06)	Denmark 29.2%	UK 26.6% (p) ^a	9.7%(p)	-	-

^a: 2006, p: provisional

Source: DG Education and Culture

Data source: Eurostat UOE and LFS

Table A.11: Best performing countries on other selected core indicator areas

	Best performing countries in the EU			EU	USA	Japan
Participation in pre-school education	Participation of 4-year-olds in pre-primary education, 2006					
	France 100%	Italy 100%	Belgium 100%	86.8%	58.2%	94.8%
Investment in education and training	Public spending on education as a % of GDP, 2005					
	Denmark 8.28	Sweden 6.97	Cyprus 6.92	5.03	4.85	3.52
	Increase in public spending on education, in percentage points of GDP (2000-2005)					
	Cyprus +1.48	Hungary +0.95	UK +0.81	+0.35	-0.09	-0.30
Educational attainment of the population	Share of the working age population with high education attainment, 15-64 years-old (ISCED 5 and 6), (2007)					
	Cyprus 29.7%	Finland 29.5%	UK 28.2%	20.6%	-	-

Source: DG Education and culture
Data sources: Eurostat UOE

4. European Educational systems in a Worldwide perspective

The European Council set the objective of “making European education and training systems in Europe a world quality reference by 2010”. (Council, 2002c, paragraph 43).

This report therefore puts European performance into a world-wide perspective by comparing it with the USA, Canada, Japan, South Korea, Australia, New Zealand, China, Russia, India and Mexico, countries which are trading partners or high educational performers.

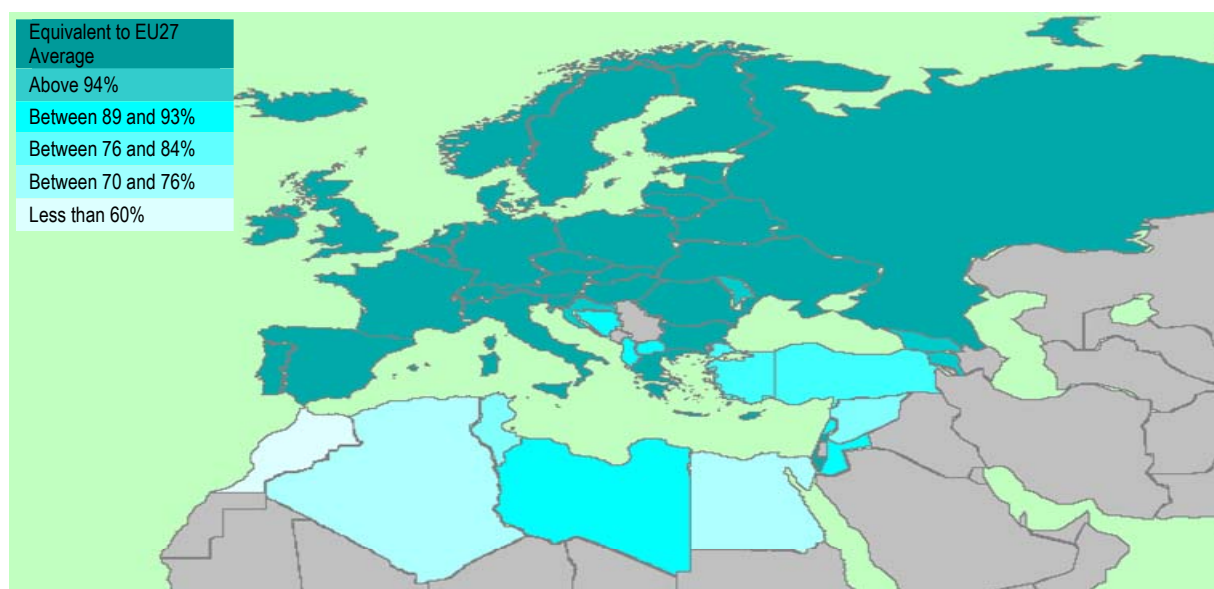
An overall evaluation of the performance of the EU compared to the rest of the World can be made by applying the UN education index, a component of the UN human development index. The education index measures a country's relative achievement in both adult

literacy and combined primary, secondary, and tertiary gross enrolment. It is a weighted average of the Adult Literacy Rate and the Gross Enrolment Rate where adult literacy is given two-thirds weight while gross enrolment is given one-third weight See Table Ann A.1 in the Statistical annex).

The education index clearly puts EU among the world's best performers. Australia, New Zealand, Republic of Korea and the US perform slightly better, Russia is level while Japan, China and India perform at lower levels. (Chart A.10)

The analysis of neighbouring countries (Chart A.9) shows that Europe's north-eastern neighbours are mostly around an equivalent level, while its south eastern and southern neighbours are some way behind (Israel and Croatia are exceptions).

Chart A.9: EU Education average performance level in a neighbouring countries perspective (EU-27 average : 100%)



Source: CRELL research Centre/ DG Joint Research Centres (2008)

Data Source: UN Education Index, 2007 (reference year 2005)

Chart A.10: EU Education performance in a Worldwide perspective (UN education index)



Data source: UN Education Index (reference year 2005)

PART B Monitoring performance and progress
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1. MAKING LIFELONG LEARNING A REALITY

1.1 Making lifelong learning a reality in Europe

1.1.1 Participation in education and training at various life-time stages

1.2 The highest performing countries in making lifelong learning a reality.

MAIN MESSAGES

Making Lifelong Learning a Reality

- **5 countries have very high performance in lifelong learning participation: Sweden, the United Kingdom, Denmark, Norway and Iceland.** Lifelong learning is becoming a reality for their citizens. Slovenia, France, Finland, Austria, Spain and the Netherlands are following closely behind. 16 European countries have developed national lifelong learning strategies, with a comprehensive vision covering all types and levels of education and training throughout life.
- **Less than 10% of adults in the EU participate in lifelong learning.** This reflects continuous progress but it is too slow to reach the benchmark of 12.5% by 2010. Catching up with adult participation in lifelong learning remains the main challenge in many European countries
- **All 4 year olds in Belgium, Italy and France participate in pre-school education.** Spain, Malta and Luxembourg are close behind and 12 countries in all exceed the Barcelona target of 90% participation. Many countries have achieved significant increases since 2000 (more than 10 percentage points for Germany ;Cyprus, Latvia, Romania, Slovenia Sweden and Norway).
- **There are 2 million more 5-29 years old in education and training in the EU than in 2000.** Today 60% of 5-29 years olds Europeans participate in education. This is comparable to the US, but 18% higher than in Japan. Increasing participation in pre-primary and higher education has been enough to outweigh the demographic changes of the new smaller cohorts.
- **Time spent by young people in education and training is increasing in all European countries.** Youth cohorts are smaller but they can expect to stay more years in education. It is the highest in Finland, the UK, Sweden and Iceland with 20 years

In 2002, the Member States committed themselves to develop national lifelong learning strategies (Council Resolution, 2002a) covering all contexts (formal, non-formal and informal) and levels of education and training (pre-primary, primary, secondary, tertiary and adult) and all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social or employment-related perspective. The Lisbon integrated Guidelines underline the need to have such strategies to be in place by end of 2006.²

The concept of lifelong learning shifts responsibility for education and learning to the individual, focusing on the development of individual capabilities and the capacity to learn; it implies a shift from traditional education institutions to diverse learning opportunities that are more process and outcome oriented.

Most European countries have made progress in defining unified and overarching strategies. 16 Member States have developed lifelong learning strategies that set out national policy priorities and how different sectors relate to each other. A lifelong learning strategy should provide a strategic overview and a coherent set of priorities while identifying the resources needed for different measures. An important aspect is to provide flexible learning pathways and effective transition points between systems and levels of education and training that avoid dead ends. It must also include a transparent system for recognition of prior learning (Council, 2008b).

This chapter analyses participation patterns in lifelong learning and makes comparisons with third countries.³

Monitoring progress at the European level

Progress is monitored through indicators of participation in learning for various age groups of the population. The benchmark is 12.5% of the population aged 25-64 should participate in lifelong learning by 2010. However, lifelong learning strategies should be address to the full range of learning, not just adult learning and should stress the quality of learning. These latter aspects are especially treated in each of other chapters of this report).

1.1 Making lifelong learning a reality in Europe

1.1.1 Participation in education and training at various life-time stages

The number of years that pupils and students in the EU can expect to spend in education (ISCED levels 0-6), has increased by one and a half year since 2000 mainly due to increases in pre-primary education and higher education. For some Member States, the increase is even more than 2 years (Latvia, Greece, and Lithuania)⁴. Table 1.1 shows this development in detail. In 2006, the expected years in education for European students were comparable with the number of years in the US and were 2 years longer than in Japan. Some third countries however have significantly longer education than the EU: In Russia it is 3 years longer, while Israel is 4 years longer.²

Table 1.1: Expected years in education and training for students in European countries (d)
Expected school years of pupils and students at ISCED levels 0 to 6

	EU27	BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	IT	CY	LV	LT	LU	HU
2000	16.7	18.6	14.2	15.6	17.8	17.2 i	16.8	16.3	15	17	16.6	16.1	13 i	15.5	15.8	14.3 i	16.1
2003	17.2	19.4	15.1	16.6	18.2	17.2 i	18	16.8	16.5	16.9	16.7	16.7	14.2 i	17.4	17.3	14.7 i	17.1
2006p	17.2	19.6	15.6	17.1	18.9	17.5 i	18.2	17.2	17.9	17.2	16.7	17	14.7 i	17.8	18	:	17.8
	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	HR	MK	TR	IS	LI	NO
2000	14.4 i	17.2	15.5	16.4	16.9	14 i	16.7 i	:	18.6	19.9	18.9	:	12.9 i	:	17.9	13.5 i	17.8
2003	14.7 i	17.3	16	17.2	17	14.9	17.4 i	15.3	19.4	19.9	20	:	16.4 i	12.4	19.2	15.5 i	18.1
2006p	15 i	17.6	16.5	17.8	16.7	15.6	17.9 i	16.1	20.3	19.9	:	14.9	13.3 i	12.5	19.9	16.1	18.3

Data source: Eurostat (UOE data collection)

(:) Missing or not available, (d) See definitions, (i) See information notes, (p) Provisional data

(d) Number of years a person of a given age (4 years in this case) can expect to spend within the specified levels, including years spent on repetition.

(i) BE: Data exclude independent private institutions. Data from the German speaking community is missing;

DE, RO, SI: Data exclude students in ISCED level 6

CY, MT: Tertiary students studying abroad are not included, as a result data is underestimated

LU: Secondary and tertiary students study abroad and are not included, as a result data is underestimated

MK: Data exclude ISCED 5A second degrees and ISCED 6

LI: Data refers to students studying in Liechtenstein (e.g. using the domestic concept). Many pupils/students study and graduate abroad, mainly in Switzerland and Austria (ISCED levels 3 to 6 after obligatory schooling)

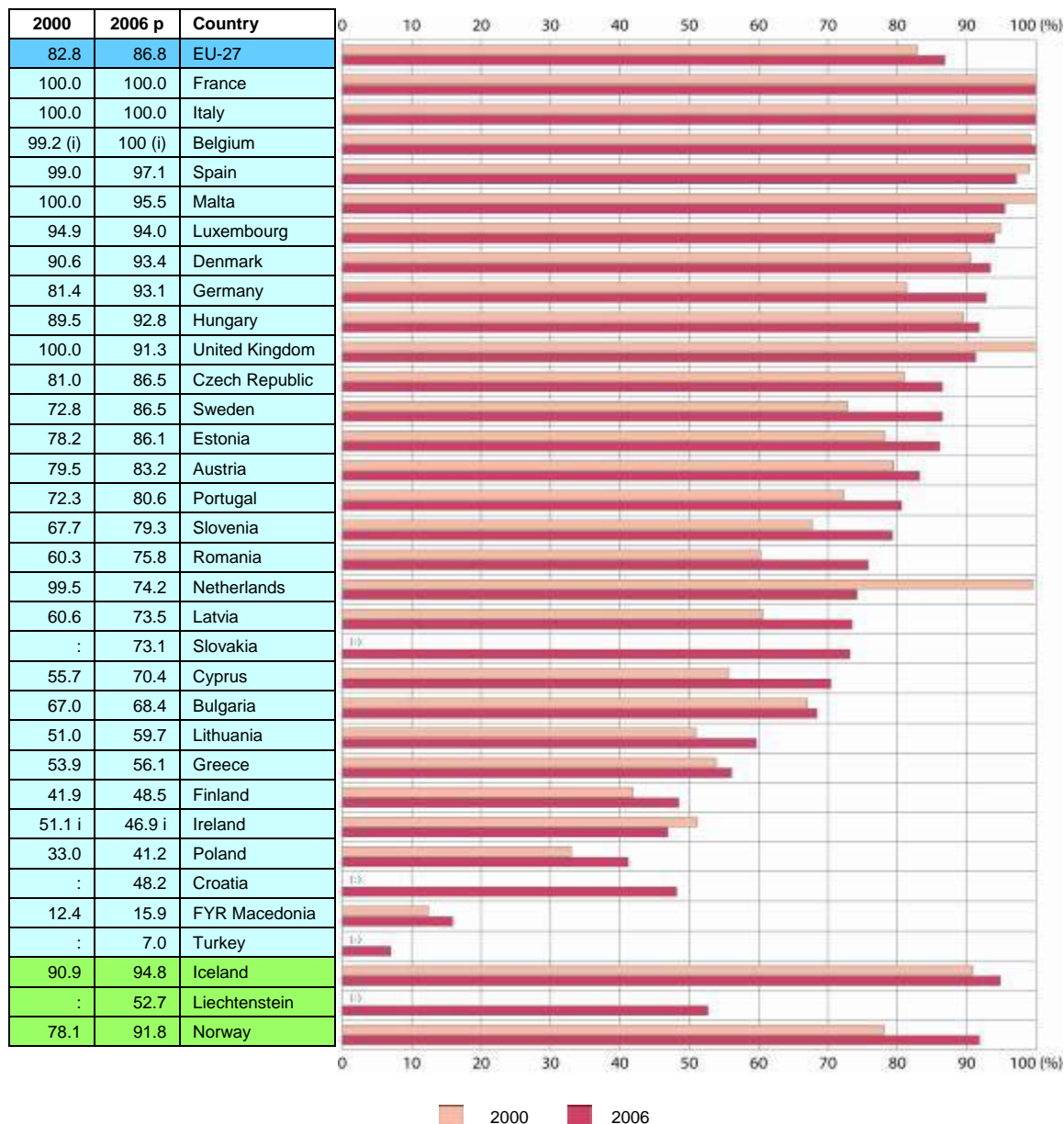
Demographic change is affecting key education indicators. In many Member States the numbers in compulsory schooling will fall over the next decade and in some, the decline will reach the later stages of education and labour market entry beyond compulsory education. In a number of European countries, the 15-19 population will fall by 30% between 2005 and 2015 (the decline goes as high as 40%). This will affect the demand for upper secondary education. Reduced cohorts

demanding less school places may offer a window of opportunity to deal with access and quality issues more easily. At the same time, while youth cohorts may be smaller, they can expect to stay longer in formal education.

Participation in early childhood education.

Participation in pre-primary or primary education of 4 years old made good progress in the EU. The average enrolment rates for 4 years old increased

Chart 1.1 : Enrolment in pre-primary or primary education of 4 years old
(Enrolment rates at ISCED levels 0 and 1)



Data source: Eurostat (UOE data collection)

(:) Missing or not available, (p) Provisional data

(i) Some countries have participation rates of 100% or close for children aged 4 (as BE, FR, ES and IT where children typically start the school at the age of 3 (see also the Eurydice publications on education);

BE: Data exclude independent private institutions. Data from the German speaking community is missing;

IE: There is no official provision of education at ISCED level 0;

NL: The Dutch figures are based on pupil counts in (pre-)primary education on the 1st of October. Between 1 October and 31 December, a quarter of the 3 years-old become 4 years-old and has the right to enter pre-primary education. Almost all of them do enter education, which brings the participation of 4 years-old on the 31 December 2006 to $74.2 + 25 = 99.2\%$.

from 82.8% to 86.8% and the improvement was widely spread. Participation rose by around 10% points or more in Germany, Cyprus, Latvia, Slovenia, Romania, and Sweden. Nevertheless, there are still large differences in participation across the Member States. More than 2/3rds of the countries had enrolment at 80% or below, in 3 Member States (Poland, Ireland and Finland), enrolment was less than 50%; and in Turkey and FYROM it was even lower. Japanese participation is above the EU, whereas the US is about 30% points lower. (See Table 1.2).

Table 1.2: Enrolment in educational institutions of 4 years old

Enrolment rates at ISCED levels 0 and 1 for 4-year olds

	EU27	USA	Japan
2000	82.8	61.7	94.9
2006p	86.8	58.2	94.8

Data source: Eurostat (UOE data collection), (p) Provisional data

Participation in school and higher education (5-29 years old).

EU enrolment in formal education institutions for age 5-29 increased to 60% in 2005 (from 57% in 2000), an increase of nearly 2 million learners since 2000. The EU rate is comparable to the US and 18% higher than Japan. 13 Member States have higher rates than the US. (See Table Ann B.1.3 in the Statistical Annex)

Participation in primary education stayed over 90% in most countries. Malta was lowest at 86%. Demand for secondary education (ISCED levels 2 and 3) continues to grow in the EU. In only 3 Member States, enrolment rates did fail to increase since 2000. In Greece, the increase was over 10%

Secondary enrolment rates were above 85% in all Member States and well above 90% in 16 countries. These levels are well above the world averages. Only 6 Member States had lower enrolment rates than the US. Enrolment for secondary education is particular high in Japan, Ukraine and Israel. Overall increases in enrolment in tertiary education have been spectacular since 2000 (see also Chapter B.4). Indeed, some Member States (like Hungary, Lithuania and Slovenia) saw their rates increase by over 25%. If tertiary enrolment was over 50% in nearly all Member States in 2005, there were still important differences across Europe. Whereas tertiary rates were above 60% in almost half the Member States, they were at or below 30% in FYROM and Turkey - as in Morocco and Algeria. Still, only Greece and Finland had tertiary enrolment rates higher than the 82% of the US. Japan was 5%

below the EU. The expansion of higher education is a major explanation for the increase in the duration of education.

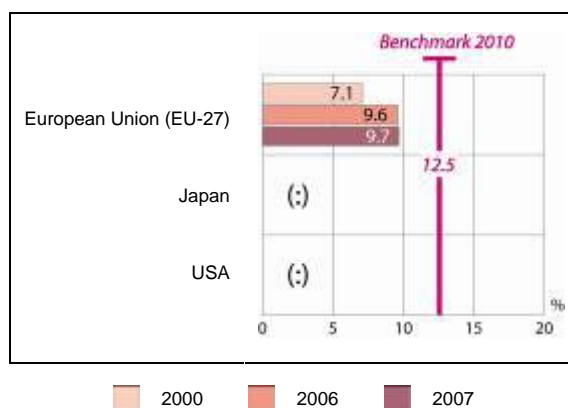
Participation in lifelong learning of adults.

Adult participation in education and training, measured by the EU benchmark,⁵ has made slow but continuous progress.

Provisional results for 2007, shows that 9.7% of 25-64 year olds participated in lifelong learning. This is still far from the benchmark of 12.5% for 2010 and only 5 Member States exceeded the benchmark. To these 5 countries can be added the UK and Sweden that both have very high levels of lifelong learning participation -but no data for 2007 are presently available.

Chart 1.2 : Lifelong learning – benchmark for 2010

Percentage of population aged 25-64 participating in education and training, 2000-2007.



Data source: Eurostat (EU-Labour Force Survey)

There are large differences in participation between Member States; the Scandinavian countries and the UK, the being the best performers, reaching rates of 20-30%.⁶ Data put Belgium, Germany, Ireland, France, Cyprus and Luxembourg in the next group, with participation rates around 7-8% whereas the Czech Republic, Lithuania, Malta and Poland are at 5-6% participation rate. Bulgaria, Greece and Romania have recorded little or no progress since 2000 in improving their extremely low levels of participation.

Participation rates of employees in continuing vocational training courses has actually decreased 1999-2005 for the countries for which data is available (Belgium, Denmark, Germany, Greece, Latvia, The Netherlands, Sweden, the United Kingdom and Norway). However there are increases among most of the new Member States which are catching up the rest of the EU (*see also Chapter B.3*).

Chart 1.3 : Participation of adults in lifelong learning (d) 2000, 2007
 Percentage of the adult population aged 25 to 64 participating in education and training



Data source: Eurostat (EU-Labour Force Survey)

* 2006 data for SE, UK, HR, IS

(:) Missing or not available, (e) Estimated data, (b) Break in series, (p) Provisional data

(d) Lifelong learning refers to persons aged 25 to 64 who stated that they received education or training in the four weeks preceding the survey (numerator). The denominator consists of the total population of the same age group, excluding those who did not answer to the question 'participation to education and training'. Both the numerator and the denominator come from the EU Labour Force Survey. The information collected relates to all education or training whether or not relevant to the respondent's current or possible future job;

Due to the changes in the Labour Force Survey, aiming at improving relevance and comparability of data at the EU level, breaks of series were noted in nearly all countries (in particular in 2003 and 2004).

1.2 The highest performing countries in making lifelong learning a reality.

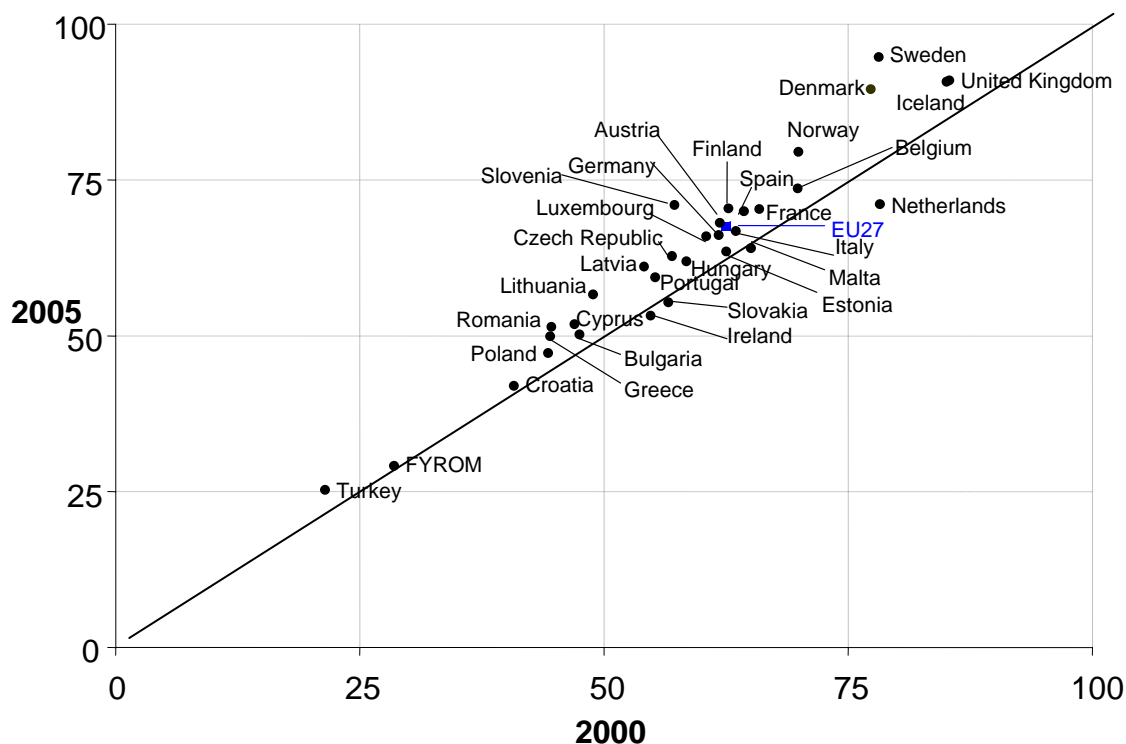
A precise measurement of "making lifelong learning a reality for all" is not possible using simple statistics. To better capture the participation patterns a composite indicator covering all the dimensions of lifelong learning is

constructed and presented in Chart 1.4. The index provides a complementary picture of very different rates of participation in pre-school, school, higher education and adult learning for 4-64 years old across the EU by taking participation in formal and non-formal education and training in the best performing countries in the EU as a reference level.

There are signs that participation in lifelong learning is close to become a reality for a majority of people in Sweden, the United Kingdom,

Denmark, Norway and Iceland, countries which have developed comprehensive and coherent lifelong learning strategies. The index shows that

Chart 1.4 Composite index on "making lifelong learning a reality" (2000-2005)



Source: CRELL, 2008

The Composite Index of Lifelong Learning in Europe is a proxy measure of participation in education and lifelong learning for the population aged 4 to 64. One indicator is used for each stages of lifelong learning: the Early Childhood Education (ECE) measures the participation of 4 years old in education at ISCED levels 0 and 1, EDU shows the participation in primary, secondary and tertiary education of population aged 5 to 29 and LLL is the EU benchmark on participation in lifelong learning (i.e. the persons aged 25 to 64 who stated that they received education or training in the four weeks preceding the Labour Force Survey as percentage of population aged 25-64). Each those index components are assigned equal weight in the overall index in accordance with the principle of considering each stage of lifelong learning participation as being of equal importance. The index is calculated as the simple arithmetic average of three indicators: ECE, EDU and LLL

Missing values (16 values missing out of a total of 99) are estimated by using multivariate analysis. The three indicators are subsequently scaled using the distance to the best performer approach, in which all countries (32 countries + EU27) and both years (2000, 2005) are considered. Given that there are no outliers in the dataset, this normalization approach is appropriate. The index score is calculated as the arithmetic average of the three normalized indicators. There are no correlation issues to be taken into account during the weighting, since path analysis results confirm that by assigning 1/3 weight to each indicator, the total impact of a single indicator to the overall index score is roughly 31%. See Table Ann B.1.1 in Annex for details on the indicators.

these countries have exceptionally high overall participation. For Slovenia, Finland, France, Austria, Spain, Belgium and the Netherlands, participation is above the European average and lifelong learning is near to become a reality for the majority of their citizens. On current trends, some of these countries will catch up on the best performing countries in the near future. The index shows Slovenia as one of the fastest advancing Member States where participation in pre-primary and school/higher education has increased during the period by 9.2% and 6% respectively

Participation in lifelong learning was already high in Sweden, United Kingdom and Denmark in

2000. This was also the case for Norway and Iceland. These countries have progressed even further since then, some notably faster than the EU average. Overall, during the period 2000-2005, the average level of EU performance increased by 1.5 points. In that period, the UK increased by 5.6, Denmark by 11.3, and Sweden by 18.7. It can hardly be a coincidence that the best performing countries (Sweden, the United Kingdom, Denmark, Island and Norway) were also those that developed a coherent lifelong learning strategy at the national level.

The index shows that lifelong learning is progressing in the EU as a whole, mainly due to

progress in pre-school and school/higher education participation. But it is too slow to reach the benchmark by 2010 in participation in adult learning, unless major progress is achieved and equity needs fully addressed (see Chapter B.6). In

particular, some new Member States will have to increase their participation rates substantially in order to catch up with the European average.

2. DEVELOPING SCHOOL EDUCATION

2.1 Completion of upper secondary education – EU Benchmark

2.2 Organization of school education

2.2.1 Decentralisation and school autonomy

2.2.2 Accountability

2.2.3 School leadership

2.2.4 Public and private schools

2.3 Teachers and professional development

2.4 ICT in schools

2.5 Investment in school education

MAIN MESSAGES

Developing School Education

- **Progress since 2000 on increasing upper secondary attainment levels of young people (20-24) has been limited.** 11 countries currently exceed the benchmark for 2010 of 85% completion. 6 of these (Czech Republic, Poland, Slovenia and Slovakia, Norway and Croatia) are beyond 90%; 5 (Lithuania, Sweden, Cyprus, Ireland and Finland) are above 85%. Malta Portugal and Lithuania made significant progress (an increase of 10 percentage points or more). Attainment in Spain and Luxembourg declined considerably since 2000.
- **21% of pupils attend private schools (incl. government dependent).** Belgium and the Netherlands have the highest shares, above 50%. The lowest shares are in the Baltic States and South-East Europe.
- **There are 6 million teachers in the EU - 3% of the active population.**
- **70% of teachers in primary and secondary schools are female.** In primary schools the figure rises to more than 90% in Bulgaria, Croatia, Hungary, Italy, Latvia, Lithuania and Slovenia. It is less than 60% in Luxembourg, Greece and Turkey.
- 15% of pupils attend schools where mathematics or science teaching is hindered by a lack of qualified teachers. The figure rises to up to 30% in Estonia and 40% in Germany.
- More than 90% of schools are connected to the internet. One in three schools has broadband internet connection. Two in three schools have created their own website.
- There are, on average, less than 10 pupils per computer in schools in the EU.
- Investment per pupil is about one third higher in secondary education than in primary education. This is mainly due to lower pupil/teacher ratios.
- Investment per pupil in primary education has increased by 15% since 2000, mainly due to the reduction in the number of pupils.

Globalisation, an ageing population, migration, changing demand for qualifications on the labour market and rapid technological innovation have increased the importance of education and training in the emerging knowledge society. As a result, schools are a more than ever important to the Lisbon strategy and its goals. Furthermore, changing social values and citizens' expectations require a constant development. As a result, schools are under growing pressure to perform. This is reflected by the growing number of performance tests and by the spread of information on inter-school disparities.

The 2008 Spring European Council called for substantial reduction in the number of low achievers in reading and of early school leavers. Furthermore, it called for the achievement levels of learners with a migrant background, or from other disadvantaged groups, to be improved. (European Council 2008a, paragraph 15)

Developing school education implies a wide policy agenda, which touches a number of policy instruments:

- curricula should enable pupils to acquire the necessary skills and values to succeed in the knowledge based society and on the labour market;
- key competences (European Council, 2006a)⁷; and employability.⁸;
- teaching practice that is more learner-centred ;
- systems such as early tracking are debated (European Council, 2006b).⁹
- transition between school levels, especially from upper secondary to higher education, should reflect a holistic view of the education system.

This chapter reviews performance on the upper secondary attainment benchmark. It then analyses some of the areas where reforms to modernise school systems are initiated. School management, the professional development of teachers and trainers, the technical equipment such as ICT and investment in education and training are key areas for change.

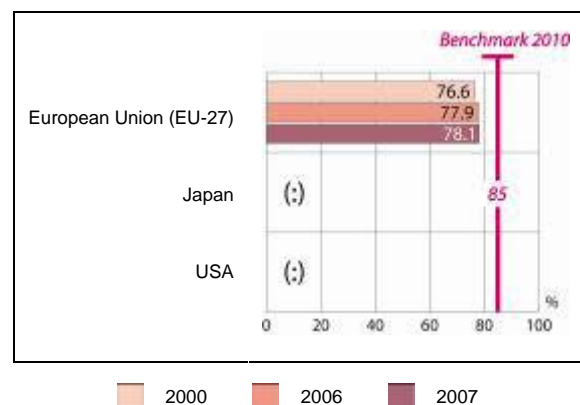
2.1 Completion of upper secondary education – EU Benchmark

Upper secondary attainment is a core indicator and related to the EU benchmark of achieving a 85% rate of upper secondary attainment of young people (aged 20-24) by 2010.

European benchmark
By 2010 at least 85% of 22-year-olds in the European Union should have completed upper secondary education.¹⁰

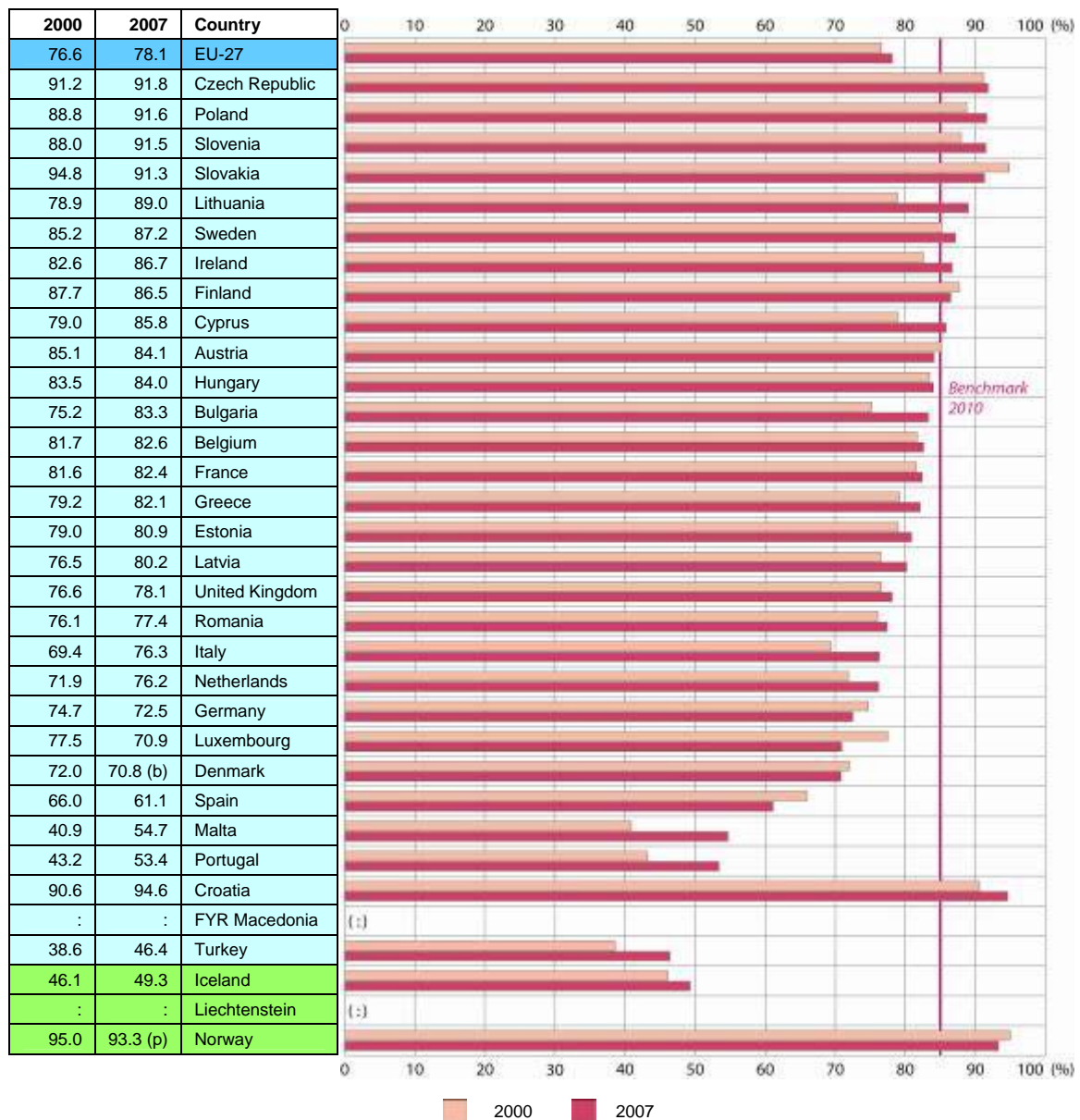
Data currently available show, however, that the share of young people (aged 20-24) who have completed upper-secondary education has only slightly improved (by 1.5 percentage points) since 2000. There was thus little progress in achieving the benchmark.

Chart 2.1: Percentage of young people aged 20-24 with upper secondary attainment, 2000-2007



The European benchmark hence still poses a significant challenge for the EU. The present (2007) EU average for the population aged 20-24 is 78.1%, whereby females outperform males by more than 5 percentage points.

Chart 2.1 - Percentage of the population aged 20-24 having completed at least upper-secondary education, 2000-2007



Source: Eurostat (LFS), Croatia, Iceland, Norway: 2006 instead of 2007, HR: 2002 instead of 2000, (p) provisional value (b) = break in series

Additional notes:

CY: Pupils usually living in the country but studying abroad are not yet covered by the survey. Hence results for CY are understated. Since the 5 December 2005 release, Eurostat has been applying a refined definition of the "upper secondary" educational attainment level in order to improve the comparability of results in the EU. For the 1998 data onwards ISCED level 3C programmes shorter than two years no longer fall under the "upper secondary" level but come under "lower secondary". This change implies revision of the results in DK (from 2001), ES, CY and IS. However, the definition cannot yet be implemented in EL, IE and AT, where all ISCED 3C levels are still included

In addition to the benchmark, several Member States have set national targets in this area.

Many of the new Member States are already above the benchmark. 4 Member States (Czech Republic, Poland, Slovenia and Slovakia), Norway and Croatia, have already reached over 90% upper secondary attainment. (Chart 2.2).

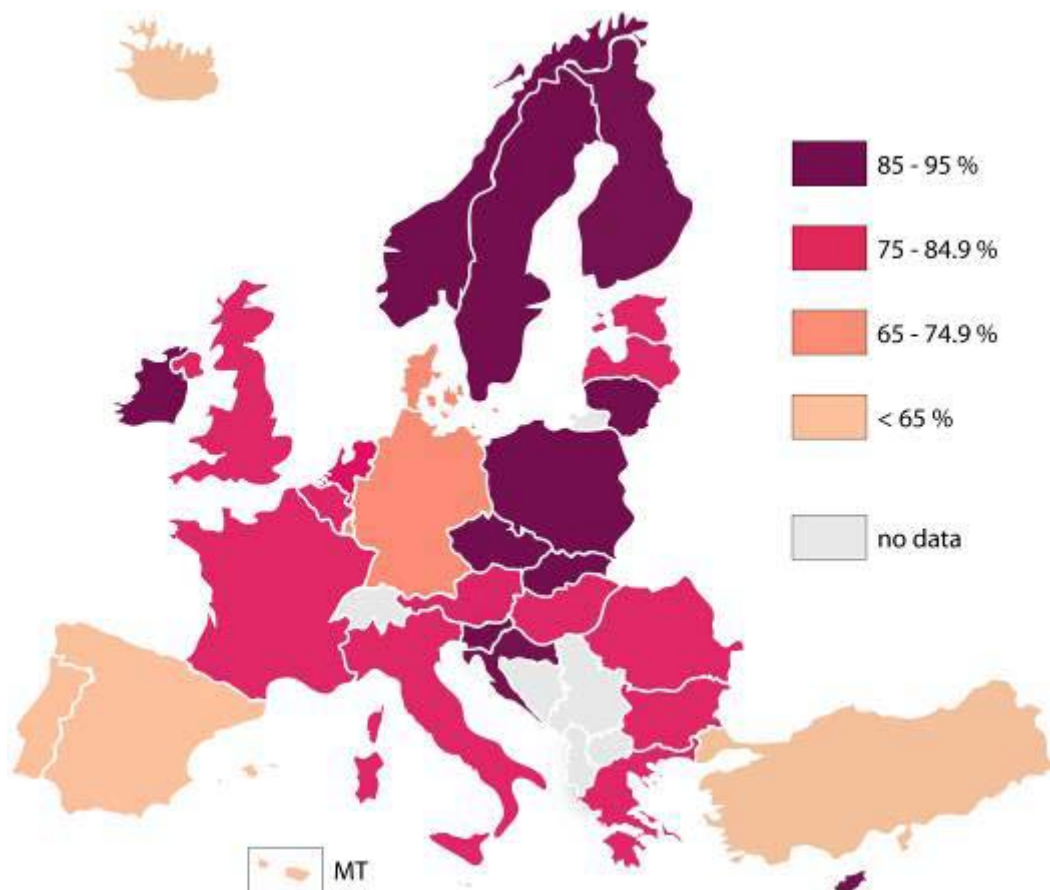
Portugal and Malta, with attainment rates below 55% and Spain, which is above 60%, have the lowest completion rates in the EU. However, Malta and Portugal have made substantial progress, increasing by over 10 percentage points since 2000. Bulgaria, Cyprus, Italy and Lithuania have also progressed by more than 5 percentage points.

Most other Member States, however, have made little progress since 2000. Upper secondary attainment in Luxembourg and Spain has even fallen. This can partly be explained by strong net migration, with many

young adults having been educated outside the national education system.

In recent years the attainment level of males improved more than the one of the females and the large gender gap closed slightly.

Chart 2.2: Percentage of the population (20-24) having completed at least upper secondary education by group of countries, 2006



Data source: Eurostat (LFS)

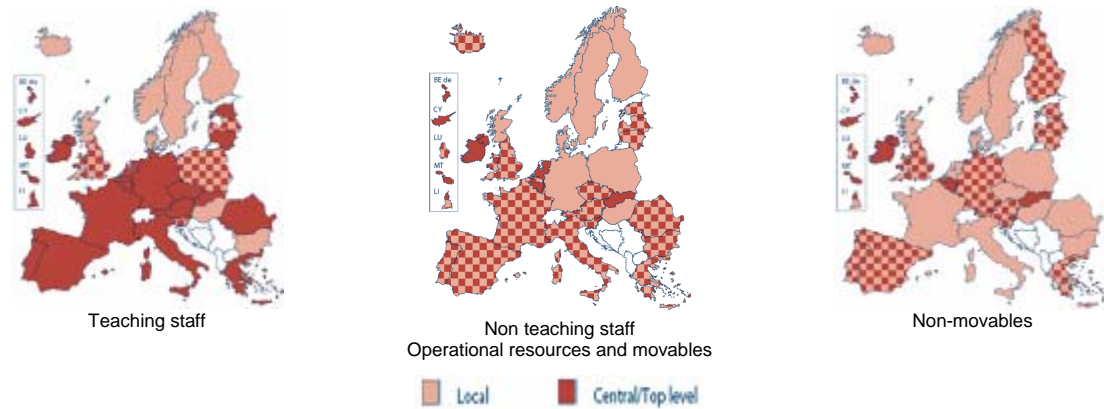
2.2 Organization of school education

The Council Conclusions on efficiency and equity in education and training (2006/C 298/03) recognise the importance of school leadership in achieving high quality learning outcomes. However, there are different concepts of school leadership and different understandings of what this entails. It depends on the context of each individual school system. Nevertheless, research on school leadership and school management is gaining momentum as the importance of leadership teams with translating policies into everyday practice is recognised.

2.2.1 Decentralisation and school autonomy¹¹

The literature has identified reforms that facilitate and characterise decentralisation (Hood, 1991; Barzelay, 2001; OECD, 1995, Paletta, 2007). They do not follow a single pattern and the process varies greatly in intensity between countries. It is more visible in northern and central European countries than in many southern European countries. Financial independence and a school's freedom to allocate its budget are often seen as keys to decentralisation,¹² enabling head teachers to choose staff who share their vision.

Chart 2.3: Location of decision-making authority to determine the overall amount of public expenditure earmarked for schools providing compulsory education, public sector or equivalent, 2002/03



Source: Eurydice 2005

The maps indicate the level of decision-making authority in a number of core areas.

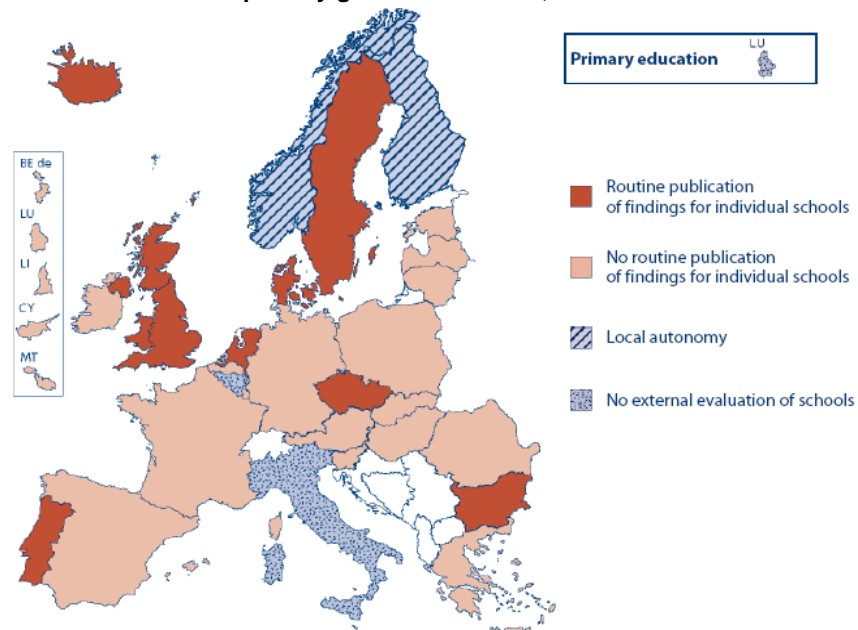
A recent EURYDICE study (2007) examined the management of financial and human resources. It noted that the Baltic countries, Belgium (French and German grant-aided schools), Slovenia, Sweden and the UK (England, Wales and Northern Ireland) grant a large degree of autonomy in these two areas. Hungary and Poland also give autonomy; but decisions have to be confirmed by a higher authority.

The picture in the Netherlands and Finland is mixed. The competent authority can choose

whether to delegate decision-making power to schools. In Luxembourg, Malta, Austria, Portugal and Liechtenstein very little autonomy is granted and in Cyprus, none.

Financial autonomy is more widespread in the use of public funds for operating expenses, the raising of private funds and its use for movable goods, and the letting of premises than in capital expenditure. Autonomy in staff management is variable. The school head is usually reporting to and is chosen by a higher authority. More decisions on staffing can be taken at school level.

Chart 2.4: Publication of findings from the external evaluation of individual schools, compulsory general education, 2006/07



Source: Eurydice (2007)

School autonomy does not necessarily lead to better results. However, research indicates that in areas characterised by local knowledge,¹³ school autonomy can have a positive effect on results, provided that adequate control systems are in place (Wößmann, 2003; Bishop, 1995).

2.2.2 Accountability

The European Parliament and Council Recommendation (2001) invites Member States to establish transparent quality evaluation systems. It encourages them to create a framework that balances schools' self-evaluations with external evaluations, to involve all relevant players in the evaluation process, and to disseminate good practice and lessons learned. Moreover, the Communication on efficiency and equity in European education and training systems called for a culture of evaluation to provide the solid evidence on which effective long-term policies should be based (European Commission, 2006a).

EURYDICE established three scenarios of school accountability in the EU (EURYDICE, 2007a).

In the majority of countries a central inspectorate is responsible for evaluating schools, which have a large degree of autonomy.

In the Scandinavian countries, Belgium and Hungary, accountability is shared with local authorities. Countries in both scenarios have developed national standards for the evaluation of schools by the end of the 1990s.

In countries such as Italy, self-evaluation is strongly encouraged although the school is not accountable to a specific body. However, this is changing. From 2009/10 the National Institute for the Evaluation of Education, Training and Teaching (INVALSI) will be responsible for evaluating schools.

There is a general trend to develop accountability to a range of bodies, from education ministries and local councils, to parents and external partners. This is the case in England, where the schools are accountable to the central OFSTED inspection, to their local authorities and to a governing body that

includes parents and local community representatives.

Only 6 Member States routinely publish findings for individual schools (See Chart 2.4). The OECD, using PISA 2006 data, has noted that students performed better in science in schools posting their results publicly (OECD, PISA, Vol1, 2008, p. 243), even after taking into account socio-economic characteristics. They also notice, however, that factors of accountability are difficult to dissociate from other aspects associated with them that might have an influence in the results.

2.2.3 School leadership

“School leadership” may have very different meanings, depending on the characteristics of the educational system. A school leader is not necessarily a head teacher or a person in a management position in the school. Research has tended to focus only on school heads and sought to identify individual characteristics of school leadership and to model leadership behaviour in different contexts. Various taxonomies have been produced to cover the different possibilities.¹⁴

These emphasise that the focus of head teachers is not directly on the pupils, but more on organisation. The TIMSS 2003 survey investigated how head teachers spend their time. It identified a number of areas of activity, ranging from administration to leadership, direct teaching, contact with families and the community and supervision.

No consistent relationship emerges between the average behaviour of head teachers in the different countries and the constraints imposed by the system architecture. In fact, the variables that determine head teachers' time allocation are too numerous and too different to allow any macro-level consideration. Such variability has often made it impossible to quantify the actual influence of school leadership on student achievement. Some evidence, however, indicates that head teachers have more impact on student performance if they focus on promoting effective teaching (Barber, M. and M. Mourshed, 2007). Other studies suggest that distributing school leadership tasks can improve school outcomes (European Commission, 2008a).

The CRELL project on “School leadership and student achievement in Europe”, using data from TIMSS 2003, has shown that head teacher specialisation, either in management (organisational and administrative activities) or leadership (knowledge and support of the educational process), reduces the impact of family socioeconomic status (SES) on student achievement.¹⁵ This has important implications for equity.

A recent OECD report suggests that school leadership could be redefined to focus on those tasks that improve most student learning. It also suggests that distributing leadership tasks can improve school results, that those involved in leadership require adequate preparation and

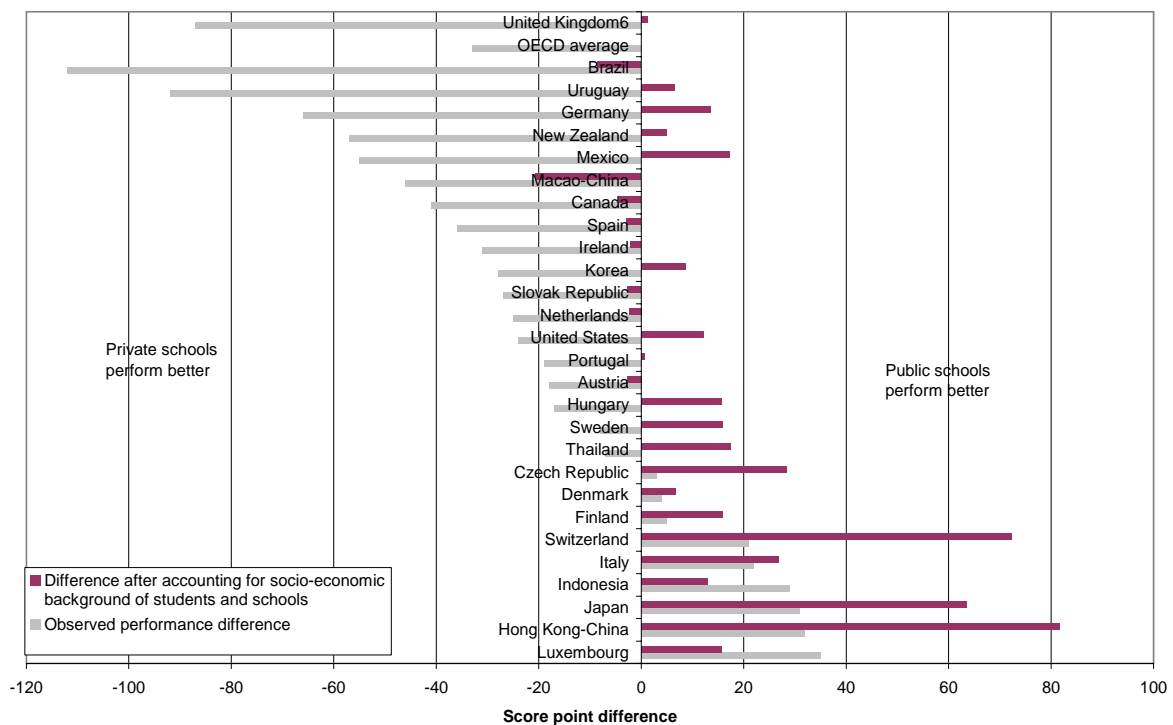
continuing training throughout their careers; and that school leadership should be made an attractive career choice (OCDE, 2008a).

2.2.4 Public and private schools

Table 2.2 below presents the percentage of 15 year-olds attending public or private schools.

A private school is defined in PISA 2006 as: “a school managed directly or indirectly by a non-government organisation; e.g. a church, trade union, business, or other private institution”. The table 2.2 shows the data extracted from EUROSTAT for 2006.¹⁶

Chart 2.5: Score differences in Science scale in PISA 2006 by country and attendance of public or private institutions



Source: Schleicher, A. (2008), PISA 2006, Note: NL: private schools are mainly government dependent)

All educational systems in Europe present a high proportion of students attending public schools, except Belgium and the Netherlands.

PISA 2006 shows that public and private schools differ in their student performance (chart 2.5). In general, private schools perform better than public schools. But private schools tend to have a high share of students with high

socio-economic status, while public schools tend to have higher shares of disadvantages students. When this is taken into account, the differences are considerably reduced.

Ministers of Education agreed in 2007 to give high priority to sustaining and improving the quality of teacher education. They gave high priority to ensuring that provision for teachers'

initial education, early career support (induction) and further professional development is coordinated, coherent, adequately resourced and quality assured. Furthermore, they stated that teachers should be autonomous learners, able to reflect upon their own work, and engage in research as part of their career-long professional development. They noted that greater incentives were needed to encourage and support teachers throughout their careers to review their learning needs and to acquire new knowledge, skills and competence through formal, informal and non-formal learning (European Council, 2007b and European Commission, 2007a).

Table 2.2: Share of pupils in public and private schools (2006)

% of pupils, 2006 for ISCED 1-4	Public	All Private (incl. government dependent)	Private independent as a % of total
EU-27	79	21	:
Belgium	43.0	57	:
Bulgaria	98.1	1.9	1.9
Czech Republic	93.2	6.8	0.2
Denmark	87.5	12.5	0.1
Germany	93.3	6.7	:
Estonia	97.3	2.7	2.7
Ireland	99.4	0.6	0.6
Greece	92.9	7.1	7.1
Spain	70.3	29.7	4.6
France	78.7	21.3	0.7
Italy	94.4	5.6	5.2
Cyprus	89.9	10.1	10.1
Latvia	98.7	1.3	1.3
Lithuania	99.6	0.4	0.4
Luxembourg	87.4	12.6	7.3
Hungary	88.2	11.8	:
Malta	69.2	30.8	8.7
Netherlands	23.6	76.4	-
Austria	91.1	8.9	:
Poland	93.2	6.8	6.1
Portugal	87.0	13	8.7
Romania	98.7	1.3	1.3
Slovenia	98.4	1.6	0.1
Slovakia	92.1	7.9	:
Finland	93.1	6.9	:
Sweden	92.4	7.6	:
United Kingdom	79.8	20.2	5.5
Croatia	98.9	1.1	1.1
FYR Macedonia	99.6	0.4	0.3
Turkey	98.1	1.9	1.9
Iceland	95.6	4.4	0.1
Liechtenstein	95.8	4.2	3.8
Norway	95.5	4.5	:

Source: EUROSTAT (UOE)

Notes: BE: Data exclude independent private institutions and enrolments in the German speaking community

NL: data refer to the year 2004

EL: Programmes supervised by Ministries other than the Ministry of Education are reported for the first time for ex. adult literacy programmes for ISCED 3C (+14%), ISCED 4C(+7%). ES: Data include for the first time students in ISCED 3C short (+ 5,9%) FI: Improved coverage for the programmes ISCED 3 and 4 vocational (14% increase for ISCED 3 and 11% increase for ISCED 4).

2.3 Teachers and professional development

Teachers form one of the most important interfaces between society and individuals. The quality of their work is a key determinant in the educational success of students. The quality of teaching staff thus has implications for Europe's economic and social development.

Economic and social changes in Europe are making increasingly complex demands on the teaching profession. The current emphasis on lifelong learning and on "learning at the centre" (Council of the European Union, 2008) requires that teachers become more "research practitioners" (European Commission, 2008a).

Teachers are expected to teach effectively in classes that are culturally and linguistically increasingly heterogeneous, to adapt their teaching to the needs of each individual, to be sensitive to culture and gender issues, to promote tolerance and social cohesion, to respond effectively to disadvantaged pupils and pupils with learning or behavioural problems, to use new technologies and to keep pace with rapidly developing fields of knowledge and approaches to student assessment.

Table 2.3: Teachers as a % of active population and share of part-time teachers (2006)

Data for 2006	Teachers as % of active pop	% of part-time teachers		
		ISCED	ISCED	ISCED
		1	2	3
Belgium	4.0	29.7	39.7	45.4
Bulgaria	2.2	1.0	3.5	4.8
Czech Rep.	2.3	:	:	:
Denmark	:	:	:	:
Germany	2.0	56.8	42.8	42.1
Estonia	2.3	61.7	72.9	64.9
Ireland	2.7	22.7	:	29.4
Greece	3.0	3.0	3.0	3.1
Spain	2.2	8.5	15.9	14.7
France	2.6	9.6	15.5	11.8
Italy	2.8	1.6	1.9	3.4
Cyprus	2.5	3.4	5.1	6.3
Latvia	2.7	27.0	26.8	27.6
Lithuania	3.4	17.5	31.6	:
Luxembourg	3.3	18.1	:	7.1
Hungary	3.2	2.6	8.3	19.7
Malta	3.6	3.0	3.7	5.8
Netherlands	2.8	55.9	:	47.7
Austria	2.4	24.3	22.1	25.8
Poland	3.1	22.7	26.7	38.7
Portugal	2.9	:	:	:
Romania	2.1	3.7	23.2	12.5
Slovenia	2.2	1.7	11.2	19.5
Slovakia	2.4	10.0	6.5	13.9
Finland	2.5	:	:	:
Sweden	3.0	28.9	28.9	28.7
UK	2.5	20.8	16.0	37.4
Croatia	2.7	5.8	24.5	50.9
FYR Maced.	:	0.8	10.2	14.8
Turkey	2.4	:	:	:
Iceland	3.5	:	22.7	28.6
Liechtenstein	:	:	:	:
Norway	3.7	39.0	39.0	33.5

Source: EUROSTAT (UOE)

For country specific notes see:
http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0,1136184,0_45572595&_dad=portal&_schema=PORTAL

Table 2.3 shows the number of teachers as a percentage of the total active population. The range goes from around 2% in Germany, Spain and Slovenia to more than 4% in Belgium and Malta, with 3% for the EU as a whole. The workforce of 6 million teachers, and 1 million pre-primary educators; was up by 50 000, nearly 1%, since 2000. However, some Member States have experienced a strong reduction of their teaching workforce: France (-13%), Slovakia (-12%), Romania and Bulgaria (-11%). Others experienced an increase; Lithuania (+22%), Greece (+19%) and Ireland (+16%).

Table 2.4: Share of female teachers (2006)

Data for 2006	Females as a % of all teachers			
	ISCED	ISCED	ISCED	ISCED
	1-3	1	2	3
EU-27*	69.1	83.2	65.7	57.3
Belgium	66.0	79.3	60.2	58.4
Bulgaria	81.2	93.1	80.1	75.5
Czech Republic	72.2	94.7	73.6	57
Denmark	:	:	67.1	:
Germany	64.4	84	60.6	47.1
Estonia	85.5	89.4	82.4	81.4
Ireland	72.8	84.7	:	62.1
Greece	59.7	64.2	65.5	47.8
Spain	62.5	70.5	62.5	50.2
France	65.7	81.7	63.9	53.5
Italy	77.8	95.7	75.7	60.3
Cyprus	69.3	82.6	67.6	54.8
Latvia	87.6	96.8	85.3	85
Lithuania	84.3	97.7	81.8	:
Luxembourg	58.2	71.6	:	46.5
Hungary	78.7	96	78.1	64.4
Malta	70.2	88.6	63.8	39.2
Netherlands	66.3	82.6	:	45.6
Austria	69.7	89.2	68.8	51.1
Poland	75.9	84.3	73.4	65.7
Portugal	72	80.6	66.6	64.6
Romania	71.9	86.7	68.1	64.7
Slovenia	78.4	97.4	78.5	64.4
Slovakia	76.4	89.4	75.9	69.2
Finland	:	:	:	:
Sweden	68.5	81.0	66.1	50.9
United Kingdom	67.8	81.3	61.1	61.1
Croatia	72.3	90.4	71.0	64.4
FYR Macedonia	58.2	70.2	51.8	56.4
Turkey	45.2	46.8	:	41.6
Iceland	72.1	:	79.7	52.7
Liechtenstein	59.2	75.0	49.0	36.5
Norway	66.2	73.0	73.0	47.4

Source: EUROSTAT (UOE)

*EU27 calculated with the weighed average of countries with data
 For country specific notes see:
http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0,1136184,0_45572595&_dad=portal&_schema=PORTAL

The Netherlands, Belgium and Germany have high levels of part-time teachers; while Italy, Greece and Malta have the lowest (Table 2.3). The highest proportion of part-time teachers is generally in ISCED 3, although Germany and some others have more part time teachers in primary school. There are big differences between Member States in the share of teachers over 50 (Table 2.5) with Germany over 50% and Italy and Sweden over 45%. The other Member States have less than 35% older teachers. The share of teachers under 30, on the other hand, is only 5% in Germany, but more than 25% in Romania and Malta.

Table 2.5: Age distribution of teachers, 2005

Teachers by age (%), for ISCED 1-3	Less than 30 years old	50 years and older	60 and older
Belgium	17.8	27.9	2.3
Bulgaria	10.1	26.2	2.2
Czech Republic	:	:	:
Denmark	:	:	:
Germany	5.1	54.7	9.3
Estonia	:	:	:
Ireland	17.5	32.8	6.1
Greece	8.3	23.0	2.6
Spain	10.3	27.6	3.9
France	13.1	31.4	1.1
Italy	2.7	47.4	5.8
Cyprus	24.9	12.7	0.6
Latvia	22.7	29.4	:
Lithuania	13.5	28.1	7.9
Luxembourg	23.2	28.2	1.5
Hungary	13.7	24.1	3.2
Malta	32.3	26.4	2.1
Netherlands	15.7	34.9	3.6
Austria	8.1	25.6	0.8
Poland	14.9	18.9	2.4
Portugal	16.5	22.1	2.4
Romania	25.6	29.8	2.9
Slovenia	11.7	19.8	1.7
Slovakia	16.1	34.8	6.4
Finland	10.0	32.5	3.5
Sweden	8.7	45.3	12.5
United Kingdom	17.9	31.9	1.5
Croatia	:	:	:
FYR Macedonia	11.1	30.9	4.1
Turkey	:	:	:
Iceland	10.5	33.1	8.3
Liechtenstein	15.2	24.2	3.2
Norway	:	:	:

Source: EUROSTAT (UOE)

*EU27 calculated with the weighed average of countries with data

For country specific notes see:
http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0,1136184,0_45572595&_dad=portal&_schema=PORTAL

Women account for more than 60% of teachers in all the Member States. In Latvia, Bulgaria and Hungary, there is a much higher proportion of women teachers in primary than in upper secondary. Latvia has over 86% female teachers in ISCED levels 1-3. There is a higher proportion of women in primary education than in any other level of education, except in Greece, where there is a slightly higher share of women teaching secondary. In Italy, Latvia, Lithuania, Hungary and Slovenia over 95% of primary teachers are women. In upper secondary (ISCED 3) there is a better gender balance. 6 Member States have more men than women teachers at this level.

Table 2.6: Women headteachers as a % of all headteachers (2006)

	ISCED 1-3	ISCED 1	ISCED 2	ISCED 3
Bulgaria	67.1	76.2	80	65.2
Ireland	43.0	50.8	:	37.6
Greece	73.0	:	76.7	70.9
France	64.6	80.0	41.7	40.6
Italy	39.2	:	:	39.2
Cyprus	57.3	67.4	60.0	41.9
Lithuania	72.8	:	:	:
Netherlands	29.3	32.6	:	:
Austria	37.7	66.4	21.0	27.4
Poland	70.9	78.7	69.3	57.2
Romania	52.7	62.5	52.7	52.7
Slovenia	61.8	65.0	65.1	54.0
Slovakia	65.4	86.7	50.0	49.3
Sweden	59.3	75.0	54.5	43.1
United Kingdom	61.5	72.0	:	:
FYR Macedonia	32.9	:	:	28.9
Iceland	58.0	82.4	50.0	33.6
Norway	47.7	50.6	50.6	43.2

Source: EUROSTAT (UOE)

For country specific notes see:
http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0,1136184,0_45572595&_dad=portal&_schema=PORTAL

The proportion of female head teachers is, however, much smaller in all Member States except in Greece. In Italy, for example, the proportion of women teachers in primary to upper secondary is more than 77 %, while the proportion of women head teachers is only 39%.

Professional development of teachers¹⁷

In a recent OECD survey (OCDE, 2005a), almost every country reported a shortfall in teaching skills and difficulties in updating teachers' skills, especially a lack of competence to deal with new developments in education (including individualised learning, preparing pupils for autonomous learning, dealing with heterogeneous classrooms, preparing learners to make the most of ICT and so on).

PISA 2006 reported that head teachers' views on whether lack of appropriate teaching staff hinders instruction. It shows that 14% of pupils in the EU were in schools where instruction was hindered by the lack of qualified teachers. Luxembourg, Belgium and Estonia are among those with the highest proportion (table 2.7).

Table 2.7: % of students in schools where the principal reports instruction hindered by lack of qualified teachers by subject

Data for 2006	Subjects			
	Science	Mathematics	Test language	Other subjects
EU*	14.9	12.8	8.5	23.7
Belgium	27.8	36.6	22.5	46.0
Bulgaria	1.3	2.3	1.9	22.6
Czech Republic	16.2	10.1	6.1	34.6
Denmark	24.1	5.3	3.6	25.6
Germany	36.7	19.2	11.5	43.5
Estonia	23.5	27.1	19.4	39.9
Ireland	9.1	6.6	6.0	36.7
Greece	10.1	7.3	8.6	10.6
Spain	4.4	4.9	3.3	10.1
France	:	:	:	:
Italy	12.6	15.4	13.8	20.7
Cyprus	:	:	:	:
Latvia	16.5	11.8	4.1	17.1
Lithuania	14.7	14.2	6.2	27.2
Luxembourg	33.9	44.7	52.5	39.8
Hungary	5.1	4.2	1.7	9.4
Malta	:	:	:	:
Netherlands	9.0	17.5	11.7	31.6
Austria	8.9	3.1	2.6	14.6
Poland	2.0	2.1	0.0	11.5
Portugal	0.0	1.3	0.0	2.7
Romania	2.2	0.6	4.1	12.1
Slovenia	0.3	1.0	0.8	2.9
Slovakia	8.0	7.6	22.8	28.5
Finland	2.2	2.2	1.3	11.7
Sweden	7.4	4.7	3.6	13.1
United Kingdom	17.4	24.0	12.7	22.8
Croatia	14.5	7.9	1.9	14.4
FYR Macedonia	:	:	:	:
Turkey	65.6	63.4	58.7	62.9
Iceland	25.4	16.3	7.8	20.9
Liechtenstein	9.1	5.4	0.0	1.7
Norway	19.7	16.7	9.2	35.3

Source: PISA 2006, CRELL calculations

*The EU average is the weighted average of PISA EU participating countries.

No lack of qualified teachers was reported in Portugal and Poland. However, 52% of pupils were affected in Luxembourg. Turkey has major concerns, with 62% of pupils affected.

Improving the quality of initial teacher education and ensuring that all practising teachers take part in continuous professional development have been identified as key factors in securing the quality of school education.¹⁸

Table 2.8: Teacher participation in professional development, excluding ICT-related activities (2001)

Country	Percentage of teachers who participated in professional development	
	excluding ICT-related activities	ICT-related activities
Belgium (Flemish)	48	30
Denmark	66	52
Finland	69	43
France	32	20
Hungary	30	19
Ireland	40	29
Italy	36	23
Portugal	37	26
Spain	40	29
Sweden	84	37
Netherlands*	57	45
Norway	56	44

Source: OECD (2004). Completing the Foundation for Lifelong Learning – An OECD Survey of Upper Secondary Schools

* Country did not meet international sampling requirements. The data reported are not weighted.

EURYDICE has examined how professional development is organized for teachers in lower secondary education and noted that in-service training for teachers is growing in importance: in about half the European countries it is compulsory (EURYDICE, 2002/2004). Eurydice (2003) also noted that ICT skills seem to be a priority in in-service training.

An IEA study on ICT use in schools, SITES 2006 (Law, N. et al., 2008, p. 189), found that in general terms, teachers with higher level of qualifications tend to use ICT more for their teaching. However, little information is available on teachers' actual participation in professional development.

The OECD (2004) collected information on teachers' participation in professional development. On average, in 2001 only 48% of the teachers in upper secondary education in the countries surveyed had participated in some type of professional development.

The highest participation rate was found in Sweden, the lowest in France and Hungary. Examples of professional development given in the study schools, mentoring, peer observations, participation in professional networks, participation in degree programmes (Masters and PhD), conferences to discuss research, visits to companies, collaborative research, regular collaboration between

colleagues, courses and workshops included observation visits to other teachers.

2.4 ICT in schools

The eEurope 2002 Action Plan, adopted by the European Council in June 2000 set the goal of linking all schools to the internet by the end of 2001 (Council, 2000a, p. 9). The Barcelona Spring Council of 2002 furthermore set the goal of ensuring by the end of 2003 a ratio of 15 pupils per online computer for educational purposes. In May 2002 the eEurope 2005 Action Plan, adopted by the Sevilla European Council in June 2002, set the goal of providing all schools and universities with broadband internet access by the end of 2005 (European Commission, 2002a). In 2005 the i2010 Strategy was then adopted, however, without explicit goals for education. As regards the eEurope 2002 goal of linking all schools to the internet, according to a study by Empirica (2006), this goal was nearly accomplished in 2006 in most EU countries. All Member States have more than 90% of the schools connected to the internet.

As a consequence, interest has shifted from connectivity to the use of computers in schools. Data are, however, still scarce on ICT use in schools.

SITES (Law, N. et al., 2008), a study carried out by IEA in 22 educational systems, provides some information for 9 Member States on computer use in schools. PISA could also be a source of information on the use of ICT in schools. However, PISA data is mainly relevant to 15 year-olds students, and interpretation at the school level is not straightforward.

A study carried out by *Empirica* (Bonn) in 2006 and financed by the European Commission within the Lisbon Strategy and i2010, which was based on a survey of teachers and headteachers provided some information on the use of computers in EU

Table 2.9: ICT use and equipment in schools in Europe 2006, 2001

	Number of computers/ 100 pupils		Broad band connection in schools in %		Own web page in %	
	2001	2006	2001	2006	2001	2006
EU-25		11		67		63
EU-15	8	12		72	44	62
Belgium	10	10	18	74	44	69
Bulgaria						
Czech Rep.		9		63		75
Denmark	31	27	64	95	75	99
Germany	5	9	8	63	48	70
Estonia		7		95		87
Ireland	11	10		66	38	36
Greece	5	7	3	13	15	37
Spain	7	9	10	81	43	53
France	10	12	10	75	37	29
Italy	6	8	24	69	37	73
Cyprus		12		31		51
Latvia		6		67		41
Lithuania		6		33		60
Luxembourg	32	20	3	77	47	64
Hungary		10		77		56
Malta		11		95		63
Netherlands	13	21	27	92	44	87
Austria	11	16	23	68	43	68
Poland		6		28		56
Portugal	4	6	4	73	25	61
Romania						
Slovenia		8		85		96
Slovakia		7		40		65
Finland	17	17	52	90	77	86
Sweden	15	17	31	89	81	84
UK	14	20	15	75	50	73
Iceland		15		92		94
Norway		24		89		82

Source: Empirica (2006), p. 35

Member States (Council, 2000a). According to this study in the EU almost all schools use computers for instruction¹⁹. In the EU (15), this went from 94% in 2001 to 99% in 2006. Greece experienced the highest increase from 72% to 100%, while Portugal went from 70 to 97%. In the EU (25), 67% of schools had a broadband connection, 63 % had their own web page and 55% their own intranet (LAN).

The percentage of schools with their own web page grew from 44% in 2001 to 62% in 2006 in EU (15). All countries except Greece, France, Ireland and Latvia have more than half of their schools with a web page in 2006. Portugal experienced a 36 percentage points increase from 2001, from 25% to 61%. France and Ireland are the only two countries where the proportion did not increase from 2001. This might indicate some differences in the data collection procedure.

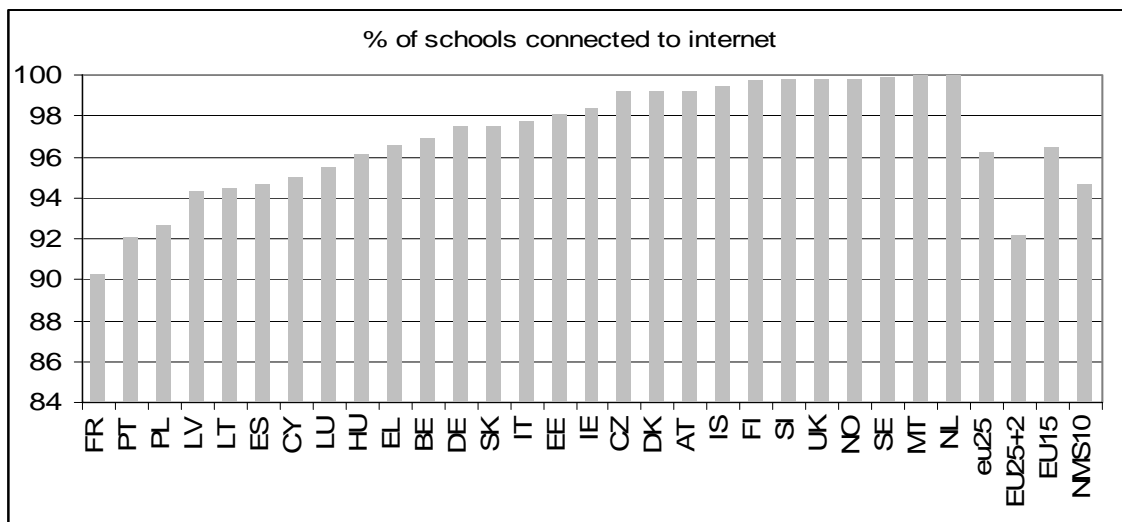
Empirica reported 9 students per computer for the (25) in 2006 (compared to the eEurope 2005 goal of 15 students per online computer by end 2003). The range goes from 6 computers in Portugal, Poland, Latvia and Lithuania to 27 computers for every 100 students in Denmark. Scandinavian countries tend to have higher level of computers per pupil, together with the Netherlands and UK; while Southern European countries and East European countries tend to have fewer computers per student PISA 2006 provides additional information on the ratios of students to computers. However, the only way of analysing the data is by calculating the percentage of students that are in schools with certain level of student/ computer ratio. Calculating school averages with PISA data would be biased, since PISA has a representative sample of 15 year-olds, and not of schools. Thus, chart 2.6 shows the percentage of 15 year-olds that are in schools where the computer-student ratio is higher than the average of all schools participating in PISA. This is equivalent to around 16 computers per student.

The chart has a correspondence with the *Empirica* data, in the sense that countries with low levels of computer-student ratio have a low proportion of schools above the average in PISA. Only six Member States present more than 50% of the students enrolled in schools with more than 11 computers per student. The UK, is the country where most students are in schools with high proportion of computers per student.

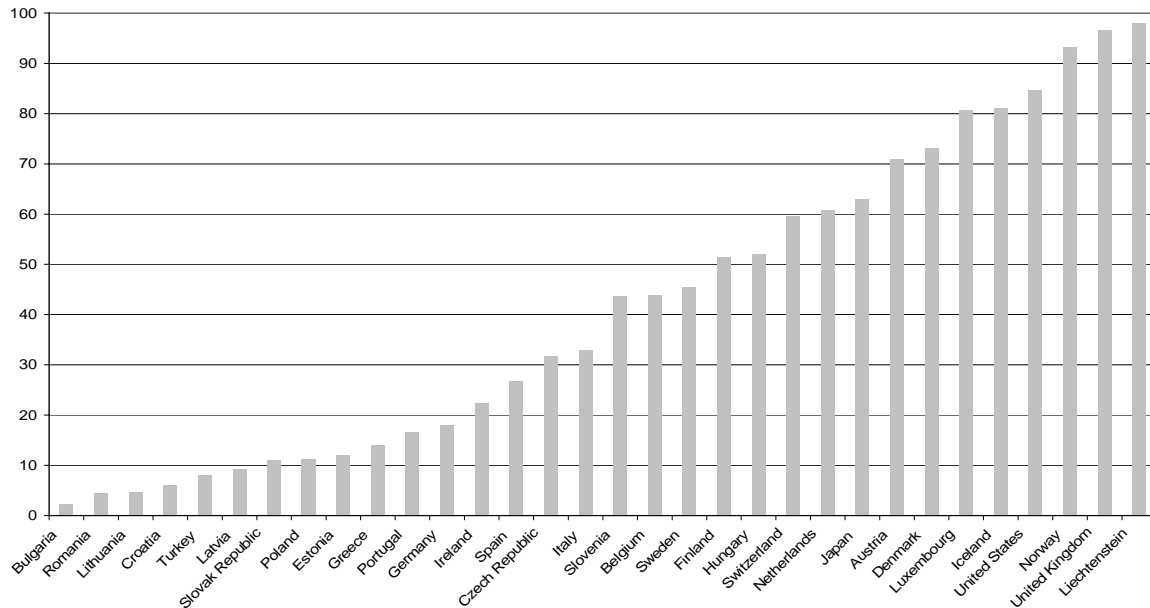
The figure shows the enormous differences among countries. Bulgaria and Romania have less than 5% of students in schools with high proportion of computers, while the UK or Norway have more than 90%.

However, the availability of computers does not mean that students will necessarily use the computers at school often. Table 2.10 shows the percentage of 15 year-olds that report using computers every day or almost every day by place of use. Use of computers at home is by far much more common than use of computers at school.

Chart 2.5: % of schools with connection to the Internet



Data Source: Empirica (2006)

Chart 2.6: Share of students in schools with high proportion of computers per student (more than 16 computers per 100 students). (%)

Source: PISA 2006, CRELL calculations

In the EU countries for which data are available around 72% of students use computers at home every day or almost every day, while this is the case for 8% at school. The range goes from more than 91% in the Netherlands to 48% in Ireland for computer use at home; and from 21% in Denmark to 2% in Germany for the use of computers at school.

Austria, Norway, Denmark and the Netherlands present a high proportion of students using computers both at home and at school. Other countries such as Sweden, Iceland, Germany or Finland present a high proportion of students using computers at home, but a lower proportion of using them at schools every day. Finland, for example, presents 82% of students reporting using computers at home everyday or almost everyday, while this is the case for only 3% at home. Countries that have lower levels of computer use at home such as Greece, Italy or Ireland, present mid levels of computer use at home (from around 5 to 8%).

Hungary, Portugal, Bulgaria and the Czech Republic present relatively high performance of computer use in schools and mid to low use at home. These are countries that in other ICT indicators are catching up with other countries.

Table 2.10: % of 15 year old students that report using a computer everyday or almost everyday by place of use

	At home	At school	Other places
EU-27			
Belgium	80.4	4.8	4.5
Bulgaria	67.4	10.2	19.7
Czech Republic	72.2	10.2	7.4
Denmark	84.3	20.8	9.1
Germany	74.2	2.1	4.3
Estonia	:	:	:
Ireland	48.0	7.7	2.8
Greece	53.2	5.0	13.5
Spain	70.3	3.0	6.6
France	:	:	:
Italy	64.4	5.6	5.2
Cyprus	:	:	:
Latvia	64.5	8.1	10.1
Lithuania	74.5	4.8	5.5
Luxembourg	:	:	:
Hungary	66.6	9.6	6.6
Malta	:	:	:
Netherlands	91.2	15.7	4.9
Austria	68.8	17.0	5.7
Poland	71.9	2.6	5.5
Portugal	74.9	10.0	7.1
Romania	:	:	:
Slovenia	79.9	3.1	4.3
Slovakia	62.0	5.8	5.9
Finland	81.6	3.3	5.2
Sweden	85.0	9.5	6.1
United Kingdom			
Croatia	70.8	3.3	4.1
FYR Macedonia			
Turkey	39.0	9.1	18.3
Iceland	90.1	7.8	7.4
Liechtenstein	82.6	5.2	4.9
Norway	89.5	17.3	9.4

Source: PISA 2006, CRELL calculations

2.5 Investment in school education

The 2006 Joint Report pointed out that “the necessary reforms cannot be accomplished within current levels and patterns of investment.” (European Commission, 2006b, p. 2) The challenge facing Member States is “to identify those priorities for education investments that will impact most efficiently on the quality and equity of learning outcomes.” (European Council, 2006b, p. 2)

Developing and modernising school education requires resources, for example for investing in teachers and their training; for ensuring ICT resources in all schools; for implementing organisational changes and for ensuring good quality assessment systems. Measures to promote inclusive education could also need more and targeted funding, as would investment in pre-primary education and early intervention programmes or measures supporting pupils with special educational needs (providing specially trained teaching and guidance staff and welfare service).

Table 2.11 Basic demographic trends EU school population, by level, (million, EU-27)

ISCED level	2000	2005	2006
1 (primary)	31.1	29.0	28.5
2 (lower sec)	22.7	23.4	22.9
3 (upper sec)	24.5	26.0	22.2
4	1.4	1.4	1.4
Total	79.7	79.7	(75.0)

Source: Eurostat (UOE)

Note: break in series for upper secondary for 2006, ISCED 3 and total not comparable with year before.

Financing is thus an important aspect of modernising and developing school education.

When analyzing the development of spending on school level education the demographic development has to be taken into account.

Primary (ISCED 1) and lower secondary (ISCED 2) education are more affected by demographic trends than upper secondary (ISCED 3) or post-secondary non-tertiary (ISCED 4) education, where growing participation rates can compensate for a decline in cohort size.

The number of primary pupils has fallen in the EU in the period 2000-2006 by more than 8%. The number of pupils in lower secondary education has increased in the same period by nearly 1% while there was a 6% growth in the number of pupils in upper secondary education in the period 2000-05 (in 2006 a break in series in the UK led to a decline in figures).

Taking all education levels together the number of pupils in the EU has remained stable at nearly 80 million since 2000. However, at national level, changes in school population were even stronger. Many New Member States saw a decline in the number of primary pupils of over 20% in the period 2000-2005. Ireland and Slovenia in recent years saw a considerable fall in the number of lower secondary pupils, while the number of upper secondary pupils declined considerably in Poland. It is important to take these developments into consideration when analyzing spending trends.

Apart from the development of the number of pupils the student-teacher ratio is an important factor in explaining spending levels (teacher salaries making up the lion's share of spending on schools). The student to teacher ratio stood at about 12 students per teacher in the EU in 2006

Table 2.12: Basic demographic trends by ISCED level, 2000-2006

	Growth in the number of pupils 2000-2006 by ISCED level			
	ISCED 1	ISCED 2	ISCED 3	ISCED 4
EU-27	-8,4	0,7	:	-0,1
Belgium	-5,3	15,6	14,6	32,4
Bulgaria	-30,5	-13,5	12,9	-30,8
Czech Republic	-26,6	-5,6	13,2	60,6
Denmark	8,2	13,2	18,9	-68,1
Germany	-8,9	-1,9	6,4	7,0
Estonia	-35,5	3,7	9,8	12,2
Ireland	2,7	-5,8	-7,9	71,1
Greece	0,0	-7,8	-0,9	-53,9
Spain	4,3	-3,2	-7,0	:
France	4,3	1,5	3,6	77,4
Italy	-1,0	0,9	6,8	41,9
Cyprus	-6,7	-0,4	7,3	:
Latvia	-41,6	-1,8	6,5	-32,9
Lithuania	-31,1	0,3	18,8	86,2
Luxembourg	9,0	12,2	15,4	7,4
Hungary	-16,9	-3,1	10,2	-22,1
Malta	-13,7	-2,4	45,7	38,1
Netherlands	-0,1	4,4	7,1	-71,3
Austria	-9,5	4,9	5,5	40,4
Poland	-34,4	170,1	-26,3	54,8
Portugal	-7,9	-10,2	-16,8	:
Romania	-21,0	-21,6	14,8	-53,9
Slovenia	7,6	-18,0	-1,6	432,0
Slovakia	-23,9	-12,0	16,1	-17,2
Finland	-4,1	1,4	16,7	460,6
Sweden	-10,8	18,0	-5,1	-16,7
United Kingdom	-2,5	2,5	:	:
Croatia	:	:	:	:
FYR Macedonia	-16,9	-8,6	4,5	65,5
Turkey	7,7	:	45,6	:
Iceland	2,8	16,8	14,4	116,5
Liechtenstein	7,0	2,7	292,5	:
Norway	2,4	17,4	5,1	28,0

Source: Eurostat (UOE)

For country specific notes see: http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0,1136184,0_45572595&_dad=portal&_schema=PORTAL

(14 in primary, 10 in secondary). It ranged from more than 17 students per teacher in Germany to seven students in Portugal (in 2005). The student to teacher ratio tends to be higher in lower levels of education. The average in the EU for primary school level was about 14 students per teacher, while for upper secondary education it was around 13 students per teacher. There are fewer students per teacher in secondary education, compared to primary. The case of the UK is important with a difference of more than 12 students in the ratio of primary and upper secondary. Data on investment in education as a percentage of GDP show the financial effort countries are making as regards investment in education.

Table 2.13: Ratio of students to teachers

Data for 2006	Ratio of students to teachers			
	ISCED 1-3	ISCED 1	ISCED 2	ISCED 3
Belgium	10,9	12,6	9,4	10,2
Bulgaria	12,9	15,8	12,3	11,7
Czech Republic	13,4	17,3	12,3	11,9
Denmark	11,9	:	11,9	:
Germany	17,2	18,7	15,5	19,5
Estonia	13,3	14,1	12,3	13,3
Ireland	16,9	19,4	:	14,6
Greece	9,2	10,6	8	8,3
Spain	12,0	14,2	12,5	7,8
France	14,3	19,4	14,2	10,3
Italy	10,7	10,7	10,3	11
Cyprus	14,0	16,8	11,6	12,7
Latvia	11,2	11,8	10,5	11,7
Lithuania	9,0	10,7	8,5	:
Luxembourg	:	:	:	:
Hungary	10,9	10,4	10,2	12,3
Malta	10,6	12,1	8,4	17,4
Netherlands	15,5	15,3	:	15,8
Austria	11,7	13,9	10,4	11,3
Poland	12,1	11,4	12,6	12,7
Portugal	7,0	10,8	8,2	:
Romania	14,7	17,1	12,2	15,7
Slovenia	12,9	14,9	10,2	14
Slovakia	14,9	18,6	13,7	14,2
Finland	14,7	15,9	10,0	18,0
Sweden	12,4	12,1	11,4	13,8
United Kingdom	14,5	20,7	17,0	7,9
Croatia	13,7	17,7	12,8	11,8
FYR Macedonia	16,5	:	:	17,3
Turkey	23,2	26,7	:	15,8
Iceland	10,7	10,6	:	10,8
Liechtenstein	9,1	10,5	7,3	11,4
Norway	:	:	:	:

Source: Eurostat (UOE)

Note: Data for DK, FR, MT, PT, FI, UK refer to 2005

For country specific notes see: http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0,1136184,0_45572595&_dad=portal&_schema=PORTAL

Investment in primary education as a percentage of GDP has stagnated in the EU in the period 2001-05. However, since the primary population decreased at the same time by over 7% and the economy expanded by 7%, investment per primary pupil increased by nearly 15 % in this

period. In New Member States a decline in cohort size and rapid economic growth imply an opportunity to increase spending per pupil considerably in real terms. In the Czech Republic for example the stagnation in the share of GDP invested in primary education in 2001-05 is a result of a 40% real increase in spending per pupil, a 22% decline in the number of pupils and a cumulated GDP growth of 17%.

In 2005 in primary education Slovenia, Luxembourg and Cyprus showed the highest investment levels relative to GDP, while the Czech Republic Germany and Slovakia show the lowest levels. In these two countries low spending levels go hand in hand with a high number of students per teacher.

Table 2.14: Annual expenditure on private and public education institutions as a % of GDP

	ISCED 1		ISCED 2-4	
	2001	2005	2001	2005
EU-27	1.16	1,2	2.27	2.3
Belgium	1.37	1.4	2.60	2.6
Bulgaria	0.73	0.9	1.59	2.1
Czech Republic	0.69	0.7*	2.09	:
Denmark	1.88	1.9	2.87	3.0
Germany	0.68	0.7	2.30	2.3
Estonia	1.55	:	2.35	:
Ireland	1.37	1.6	1.63	2
Greece	1.03	1.1	1.38	1.4
Spain	1.10	1.1	1.77	1.7
France	1.13	1.1	2.79	2.7
Italy	1.17	1.1	2.42	2.1
Cyprus	1.71	3.2	2.76	(5.3)
Latvia	1.09	0.8	2.97	2.8
Lithuania	:	0.7	3.73	2.6
Luxembourg	1.63	2.1	1.62	1.7
Hungary	0.95	1.1	2.13	2.4
Malta	1.16	:	2.12	:
Netherlands	1.28	1.4	1.91	2.1
Austria	1.12	1.0	2.62	2.5
Poland	2.69	1.7	1.23	2
Portugal	1.70	1.7	2.38	2.2
Romania	1.17	1.3	0.87	0.8
Slovenia	2.74	2.7	1.84	1.4
Slovakia	0.59	0.7	2.05	1.9
Finland	1.31	1.3	2.42	2.6
Sweden	1.98	1.8	2.76	2.7
United Kingdom	1.17	1.4	2.26	2.5
Croatia	:	2.1	:	1.0
FYR Macedonia	:	:	:	:
Turkey	1.77	:	0.70	:
Iceland	2.39	2.6	2.53	:
Liechtenstein	:	0.7	:	1.1
Norway	3.34	1.8	1.43	2.3

Source: Eurostat (UOE), *= 2004 data

For country specific notes see: http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0,1136184,0_45572595&_dad=portal&_schema=PORTAL

Another reason is short duration of primary education (for example in Germany). In Poland spending declined in only 4 years by nearly 1% of GDP, in line with a strong decline in the number

of primary pupils. In the EU as a whole spending as a % of GDP has been stable since 2001.

As regards secondary education Cyprus, Denmark, Latvia and France show the highest investment levels in terms of % of GDP, while Greece and Slovenia, and in particular Romania show relatively low levels. The difference between investment in primary and secondary levels is largest in the Czech Republic, France, Cyprus and Portugal²⁰. Slovenia is the only Member State to have a higher level of investment in primary than secondary education.

Table 2.15: Spending per student and relative to GDP per capita (2005)

	Spending per student in 1000 EUR PPS		Expenditure per student/ GDP per capita compared with EU average (EU 27=100), 2004	
	ISCED 1	ISCED 2-4	ISCED 1	ISCED 2-4
EU-27	4.5	5.9	100	100
Belgium	5.6	6.5	105	95
Bulgaria	1.7	1.6	95	78
Czech Republic	2.3 *	3.9*	72	95
Denmark	7.2	8.0	127	109
Germany	4.2	6.6	84	96
Estonia	:	:	:	:
Ireland	4.8	6.1	75	77
Greece	3.8	4.9	87	95
Spain	4.7	6.1	97	102
France	4.5	7.7	89	119
Italy	5.6	6.3	128	109
Cyprus	5.2	8.3	119	151
Latvia	2.5	2.5	108	92
Lithuania	1.8	2.2	73	78
Luxembourg	:	:	:	:
Hungary	3.7	3.2	116	91
Malta	2.5*	3.5*	80	85
Netherlands	5.3	6.6	94	89
Austria	6.9	8.3	115	115
Poland	2.8	2.4	119	83
Portugal	3.8	5.1	113	117
Romania	1.1	1.3	:	:
Slovenia	6.6	4.6	172	91
Slovakia	2.4	2.3	72	74
Finland	4.7	6.2	95	99
Sweden	6.4	6.9	122	102
United Kingdom	5.6	7.0	97	90
Croatia	:	:	:	:
FYR Macedonia	:	:	:	:
Turkey	:	:	:	:
Iceland	7.0*	7.0*	127	99
Liechtenstein	7.0	7.7	:	:
Norway	7.6	9.3	103	79

Source: Eurostat (UOE), *= 2004 data

For country specific notes see:
http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0.1136184.0_45572595&_dad=portal&_schema=PORTAL

Overall investment levels are similar in the USA and Japan, the differences between primary and secondary level are, however, smaller in these two countries.

When analyzing data on “spending” per pupil it should be considered that these, although expressed in purchasing power parities, are affected by differences in relative wage levels between countries (wages represent by far the largest part of spending). The New Member States, where wages tend to be considerably lower, higher level of investment in primary than secondary education. Even if corrected for purchasing power, GDP per capita levels are still much lower in new Member States than in the old Member States, they hence show relatively low levels of spending per pupil. Examples are Bulgaria and Romania. This is for some countries even the case when one looks at expenditure compared to GDP per capita, implying that teacher salaries are low in these countries compared to other professions.

This is again the case for Bulgaria, but even some Member States like the Netherlands and the UK show low figures. This is partly related to student-teacher ratios (the two countries show a relatively high number of students per teacher) and wage levels of teachers compared to other professions. The highest levels of spending per primary pupil in 2005 were observed in Denmark, followed by Austria and Slovenia. On a secondary level Austria and Cyprus show the highest levels, followed by Denmark. Concerning GDP per capita Cyprus, France and Portugal spend most. Surprisingly, concerning GDP per capita, investment levels in Japan and the USA are very similar to those in the EU.

It is also interesting to note that there is no strong correlation between investment levels and student output as measured in performance tests like PISA. Finland and Ireland, the two best EU performers in PISA reading literacy, show a below EU-average level of investment per pupil relative to GDP per capita.

3. DEVELOPING VOCATIONAL EDUCATION AND TRAINING

3.1 Institutional settings in the European vocational educational and training systems

3.2 Monitoring performance and progress of vocational education and training

3.2.1 Participation in initial vocational education and training

3.2.2 Provision of continuing vocational training in enterprises

3.3 Investment of enterprises in continuing vocational training.

3.4 Improving the image and attractiveness of vocational education and training

3.4.1 Learning outcomes of vocational education and training students

3.4.2 Other outcomes of vocational training

MAIN MESSAGES**Developing Vocational Education and Training**

- **Vocational programmes are becoming more attractive in many countries largely because of the availability of more vocational programmes giving access to higher level studies.** However in United Kingdom, Belgium and Norway, at least half of the VET students are enrolled in upper secondary programmes that provide only access to the labour market. In Denmark, Spain and Iceland over 40% of the students are enrolled in such programmes.
- **Reduced participation and duration of continuous vocational training (CVT).** It has decreased, compared to 1999, in nine countries and especially in Norway, the UK and Denmark. Participation in CVT varied between 14% of employees in Greece and almost 60% in the Czech Republic. Most of the new Member States experienced increasing participation, and are catching up with the EU average.
- Results from the PISA survey shows that for countries where data are available, students in pre-vocational and vocational programmes under-perform in mathematics compared to students enrolled in general programmes.

The Copenhagen process for enhanced co-operation in vocational education and training (VET) suggests that reform and investment should focus on improving its image and attractiveness, increasing participation, and improving its quality and flexibility.

The 2008 Joint progress report of the Council and the Commission confirmed that reforms in education and training are moving forward in many areas, but more substantial efforts are required especially in the development of national lifelong learning strategies. The report indicates four major transversal policy objectives covered which are essential to the implementation of lifelong learning: elaboration of national qualifications frameworks or systems, implementing measures to assess and validate non-formal and informal learning, establishment of lifelong guidance systems and initiatives to strengthen trans-national mobility. Combined, these measures promote flexible learning pathways, enabling individuals to transfer their learning outcomes from one learning context to another and from one country to another (Council, 2008b).

With reference to the explicit objective of the Copenhagen process of improving the image and attractiveness of VET, this chapter will analyse participation and progression patterns in initial VET. The participation rate in vocational strands of upper secondary education will be analysed as a proxy reference to the core indicator on upper secondary completion rates of young people (which is analysed in chapter 2 *Developing School Education* in this report). The chapter will further look into the participation, duration and cost of continuing vocational training (CVT), based on the provisional results of the third Continuing Vocational Training Survey (CVTS 3). Furthermore some PISA results on literacy of 15 year old students in mathematics, reading and science by programme orientation will be discussed.

3.1 Institutional settings in the European vocational educational and training systems

The education and training landscape in the European Union has evolved in past decades and the distinctions between educational pathways of higher education (less or more labour market oriented: 5A and 5B²¹) have become blurred as a result of changing social, economic and political priorities. Vocational programmes differ from academic ones not only with regard to their curriculum, but also in that they generally prepare

pupils for specific types of occupations and, frequently, for direct entry into the labour market.

VET takes a variety of forms in different countries but also within countries: it can be organised as pre-vocational training to prepare young people for transition to a VET programme at upper secondary level. Initial VET normally leads to a certificate at upper secondary level. It can be school-based, company-based, or a combination of both as in the dual system. In some European countries education and work largely occur consecutively, while in others they are concurrent. Work-study programmes, which are relatively common in the Scandinavian countries but also in the Netherlands, Germany and Austria, offer coherent vocational training routes to recognised occupational qualifications. School based VET can also lead to recognized occupational qualifications in for example Austria and Norway, whereas in other European countries formal learning and work are rarely associated.

An aspect of the institutional settings of the European education and training systems is the existence of the national qualification frameworks. Qualifications achieved in VET programmes that are based on learning outcomes increase their relevance to the labour market. Although qualifications are all on the same level, they have quite different forms of delivery and assessment rules. However, it should be noted that the mapping of qualifications is rather subject to political negotiations than underpinned by research, this fact leading to several inconsistencies across countries as to what is meant by the term 'qualification'.

Some of the inconsistencies which currently exist across the information covering participation in or completion of a certain level of education is expected to be solved with the introduction of the European Qualifications Framework (EQF). The EQF is seen as an element of education policy at European level to have major impacts on VET (see Annex for more details about EQF and some other outcomes of European cooperation in the field of VET). EQF is defined as a common European reference framework for the different countries' qualification systems. Member States are invited to refer their qualifications levels and certificates to the EQF levels and to 'self align' their national qualifications frameworks against the EQF by 2010.

The EQF is intended to provide a general, shared understanding of qualifications allowing broad comparisons between countries. Moreover, the positioning of two or more qualifications at the

same level should be taken as indicating only that they are comparable in terms of the general level of learning outcomes; it does not indicate that they have the same purpose and content, nor does it take account of any structural or operational features. As a result, matching the qualifications as described in EQF with other classification systems (e.g. ISCED) for analytical purposes, will remain a difficult exercise.

3.2 Monitoring performance and progress in vocational education and training

The Helsinki Communiqué on the future priorities of enhanced European cooperation in vocational education and training states that *'adequate and consistent data and indicators are the key to understanding what is happening in VET, to strengthening mutual learning, to supporting research and to laying the foundations for evidence-based training policy'* (European Commission, 2006e).

However, as a result of reporting practices, identifying the most appropriate indicators for VET based on the information available in the statistical frameworks remains a difficult exercise.

In the coherent framework of indicators adopted by the Education Council in May 2007 there is no direct reference to indicators which monitor the developments in VET. To a certain extent VET is covered by some of the 16 proposed indicators (Council, 2007a) For example: participation of adults in lifelong learning, upper secondary completion rates of young people, early school leavers, literacy in reading mathematics and science; for other indicators which could be used as proxy measures for developments in VET (such as adult skills, language skills or learning to learn skills), data will become available in the new surveys which will be launched.

3.2.1 Participation in initial vocational education and training

Demand for secondary education continues to grow in EU countries; with the exception of three countries in all other Member States the enrolment rates went up in 2006 compared to 2000; the increase was sizeable in countries like Greece, Malta, Denmark and Lithuania. The upper secondary enrolment rates of EU countries were above 85% in all Member States and well above 90% in sixteen Member States.²²

In the past years changing labour market and economic conditions have resulted in a clear demand for more and better quality of VET in most European countries. In the school year 2005/2006 at the EU level, the proportion of students who were enrolled in vocational programmes at the upper secondary level of education (ISCED level 3) decreased with 6% to 51.7% (down from 55% in 2000/2001); this decrease represent more than three million fewer VET students than in 2000²³. Among the Member States the proportion of students who were enrolled in vocational programmes at the upper secondary level of education ranged from 13% in Cyprus to nearly 80% in the Czech Republic (*see chart 3.1*). High proportions of students (over two thirds or close) following a vocational programme at the upper secondary level of education are also registered in Austria, the Czech Republic, the Benelux countries, Slovakia, Slovenia, Finland and Romania.

The proportion of students enrolled in VET programmes at ISCED level 3 increased in 13 countries between 2000 and 2006. Countries like Italy, Malta, Spain, Finland and Sweden witnessed a considerable increase and in Portugal the share of pupils in vocational programmes increased to one third of the students although from a very low level. In most of the new Member States, however, the trend has been towards an increased proportion of students following general and academic education. Poland for example decreased its share with almost 30% from 64 to 44; In Hungary it increased in the period, but from a relatively low share in 2000. In the UK, Lithuania Poland and France all reduced the share of students enrolled in VET programmes with more than 20% in the same period.

The share of students in pre vocational and vocational programmes at ISCED 2 level is low or non-existing in most Member States. However in Belgium and the Netherlands, more than one in four students is enrolled in vocational programmes. Vocational programmes are predominant at ISCED level 4 where over 90% of the full-time equivalent students follow vocational programmes.

The structural differences in the education systems need to be further investigated in order to see whether they might help explaining the different levels of participation in VET between countries and of the recent change.

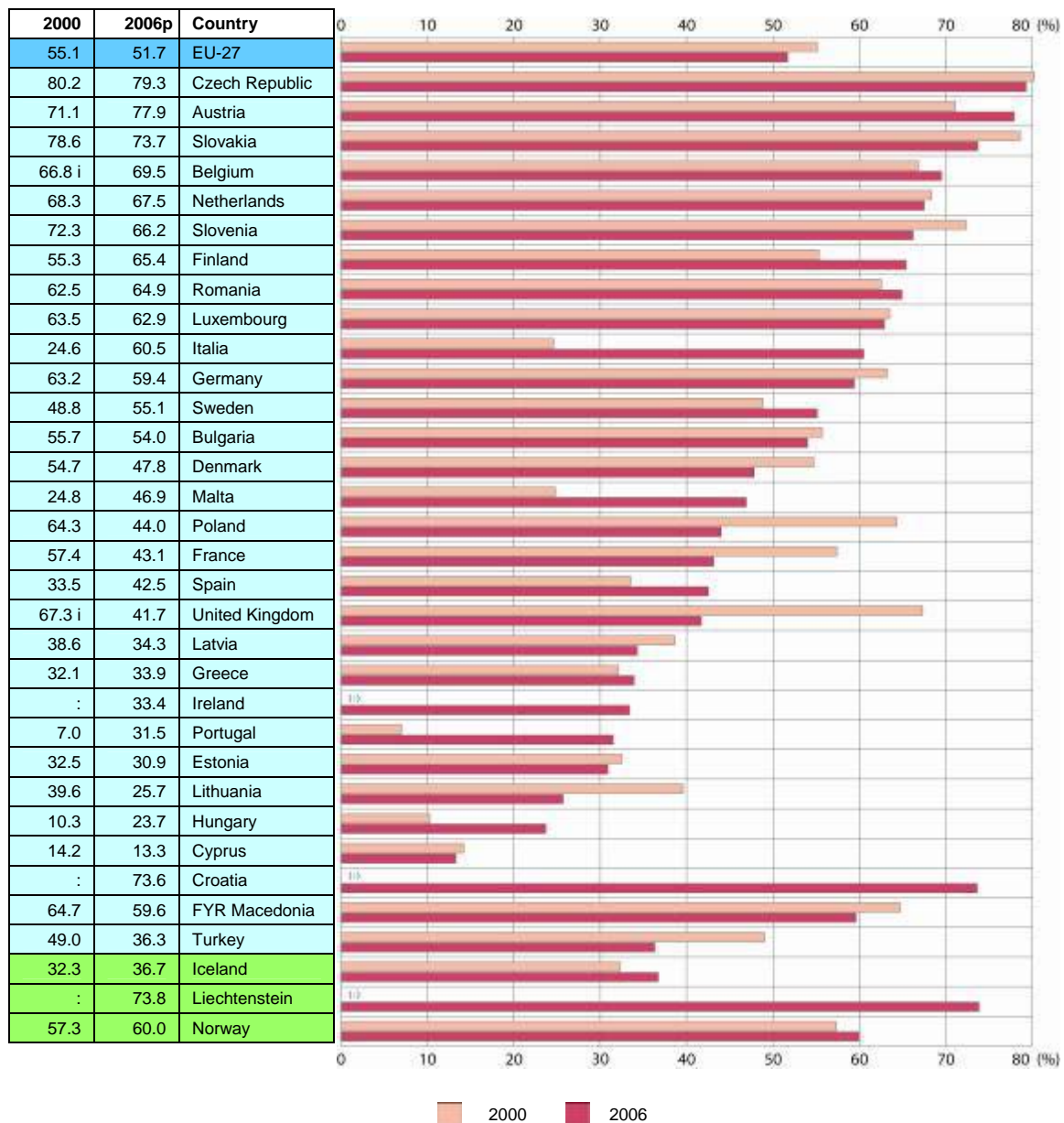
The demographic changes will have a continuing impact on education and training systems in the European countries. In many EU countries there will be fewer youths in compulsory schooling over the

next decade whereas in others, earlier demographic downturns will affect demand for later stages of education and the numbers entering the labour market. The population projections indicates that between 2005 and 2015 in some European countries the population aged 15-to-19 (which could be consider as a typical age group for initial VET) will

fall by 30%, cutting demand for upper secondary education.²⁴ Hence the next few years will offer a window of opportunity in countries where reduced cohort ease the demand for school places and allow access and quality issues to be addressed more easily.

Chart 3.1: Participation patterns in initial VET in EU countries

Students in vocational programmes (pre-vocational and vocational streams) at ISCED level 3 as percentage of all ISCED 3 students



Data source: Eurostat (UOE).

(:) Not available, (i) See information notes, (p) Provisional data

(i) BE: Excluding the students of German speaking community;

UK: ISCED 3 vocational programmes include ISCED 4. Pre-vocational programmes are included in vocational. Only students participating in courses equal to or longer than a semester are included at ISCED level 3 and 4.

For additional notes see: http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0.1136184.0_45572595&_dad=portal&_schema=PORTAL

3.2.2 Provision of continuing vocational training in enterprises

Monitoring the provision of CVT is mainly done with reference to participation rate (calculated as a

proportion of employees receiving training in a given period) and training hours per employee. Table 3.1 shows participation rates for 27 European countries based on the CVTS 3.

Table 3.1: Participation in continuing vocational training in EU countries. 1999-2005
Participants in continuing vocational training courses as percentage of employees in all enterprises (d)

	EU	BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	IT	CY	LV	LT	LU	HU
1999	40	41	13	42	53	32	19	41	15	25	46	26	:	12	10	36	12
2005p	33	40	15	59	35	30	24	:	14	33	46	29	30	15	15	49	16
	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	HR	MK	TR	IS	LI	NO
1999	:	41	31	16 (i)	17	8	32	:	50	61	49	:	:	:	:	:	48
2005p	32	34	33	21	28	17	50	38	39	46	33	:	:	:	:	:	29

Data source: Eurostat (CVTS), Extraction date June 2008

(:) Missing or not available, (d) See definitions, (i) Data refers to Pomorskie region only, (p) Provisional data

(d) A participant in courses is a person who attended one or more CVT courses, at any time during the reference year; participants are counted only once, irrespective of the number of times they attended courses;

In 2005 the participation in CVT courses (as measured by the number of participants in CVT courses as percentage of employees in all enterprises) on average was 33% (down from 40% in 1999) in the participating EU countries. The share varied from 14% in Greece and 15% in Bulgaria, Latvia and Lithuania to 59% in the Czech Republic. Participation in CVT has decreased in 2005 compared to 1999 in nine countries for which data exists (BE, DK, DE, EL, NL, FI, SE, UK, NO). There are different patterns of participation among the Member States; an increased proportion of the employees participate in CVT courses in most of the new Member States which are now catching up in participation with old Member States. Portugal and Spain show considerable increases in participation during the reference period.

The time spent on CVT (as measured by average hours spent in CVT courses per employee) varies between 3 in Greece and 16 in Luxembourg. It has followed the same pattern as the share of participation and increased in nearly all new Member States for which data exists (CZ, EE, HU, LT, PL, RO, SL) (see table 3.2). Hence, with some exceptions, the relative position of countries is the same irrespective to the measure used. The Czech Republic, Luxembourg, France, Slovenia and Sweden appear to be the most training intensive countries in 2005 (with participation rates above 45% and 13 hours and more per employee). At the other end of the distribution we find several new Member States (Latvia, Bulgaria, Lithuania, Hungary, Romania) and Greece.

Comparing the training intensity expressed by the average hours spent in CVT courses per participant, in 19 of the 24 countries where data are comparable, the numbers of hours dropped between 1999 and 2005. Specifically in the southern countries where the training intensity was rather high in 1999, and did compensate to some extent for the low participation, the decrease is remarkable (Greece,

Spain, Portugal). Only in Sweden, Poland, Slovenia and Germany the hours per participant increased slightly. In Belgium the figures are identical in 1999 and in 2005. (see table 3.2)

Table 3.2 Training duration in EU countries. 1999 and 2005

Average hours spent in CVT courses per employee and per participant (d)

	Per employee		Per participant	
	1999	2005p	1999	2005p
EU	:	9	:	27
Belgium	13	12	31	31
Bulgaria	4	4	35	30
Czech Republic	10	14	25	23
Denmark	22	10	41	30
Germany	9	9	27	30
Estonia	6	7	31	27
Ireland	17	:	40	:
Greece	6	3	39	25
Spain	11	9	42	26
France	17	13	36	28
Italy	8	7	32	26
Cyprus	:	7	:	22
Latvia	4	4	34	26
Lithuania	4	5	41	32
Luxembourg	14	16	39	33
Hungary	5	6	38	37
Malta	:	11	:	35
Netherlands	15	12	37	36
Austria	9	9	29	27
Poland	4*	6	28	30
Portugal	7	7	38	26
Romania	3	5	42	31
Slovenia	8	14	24	29
Slovakia	:	12	:	32
Finland	18	10	36	25
Sweden	18	15	31	34
United Kingdom	13	7	26	20
Norway	16	9	33	32

Data source: Eurostat (CVTS)

(p): Provisional data, (:) Missing or unavailable

As the results from the CVTS 3 illustrates, the Member States exhibit different levels of CVT. The report *Employment in Europe 2007* (European Commission 2007g) argues that government intervention in CVT at the initiative of the enterprise can be justified to ensure that the two traditional objectives of education and training are reached, namely efficiency and equity.

3.3 Investment of enterprises in continuing vocational training

An important issue for most countries is the allocation of resources for education and training. As mentioned in the 2008 Joint Interim Report the level, of efficiency and sustainability of funding remain critical and most governments seem to recognise that the necessary reforms cannot be accomplished within current levels and patterns of investment in education and training (European Commission, 2007f). (See chapter 8 for further discussion on investment in education)

As shown in table 3.3, in 2005 the training expenditures of European employers are reported between 60 Euro per employee in Latvia and 993 in Denmark (in Purchasing Power Standards). In 2005 the average figure had dropped by nearly 30% from 633 Euro to 461 Euro. Some countries have had a strong increase for example Slovenia with an increase from 167 to 517 Euro. Romania, Hungary, Lithuania and Poland also increased their investments substantially in the period. But how significant are these data in economic terms?

In the standard theory of human capital, employers and employees share the cost and benefits of training when training is firm-specific and/or training is general but there are multiple skills and each firm employs a specific-combination of skills (Lazear, 2003). When training is perfectly general, employees will pay for the full cost of training if the labour market is competitive, while employers might pay for part or all of it if labour markets are imperfectly competitive. But how large are their investments in economic terms? The average of the Member States corresponds to 1.6% of total labour costs and varying from 0.6% in Greece, to 2.7% in Denmark. In more than half of the participating countries the share of CVT courses in the total labour costs dropped between 1999 and 2005. The decrease was remarkable in Norway and the Netherlands (1.0 and 0.8 percentage points respectively). Only one third of countries (a majority of new Member States) have seen increases in the cost of CVT courses as a proportion of total labour costs. In Hungary the share increased from 1.2% to 2.6%. Country rankings by training

expenditure follow closely those by participation and average hours spent in CVT courses.

Table 3.3 Total cost of CVT courses per employee in EU countries. 1999 and 2005.

Total cost of CVT courses per employee in all enterprises (in PPS Euro) (i)

	1999	2005p
EU 27	633	461
Belgium	675	696
Bulgaria	134	69
Czech Republic	250	327
Denmark	1 132	993
Germany	506	486
Estonia	197	199
Ireland	600	:
Greece	223	137
Spain	385	367
France	753	862
Italy	563	430
Cyprus	:	317
Latvia	90	60
Lithuania	65	111
Luxembourg	592	868
Hungary	144	405
Malta	:	380
Netherlands	875	692
Austria	365	545
Poland	97*	171
Portugal	240	229
Romania	41	86
Slovenia	167	517
Slovakia	:	259
Finland	698	423
Sweden	868	776
United Kingdom	628**	351
Croatia	:	:
FYR Macedonia	:	:
Turkey	:	:
Iceland	:	:
Liechtenstein	:	:
Norway	666	421

Data source: Eurostat (CVTS), Extraction date June 2008, (:) Missing or not available, (i) See information notes, (p) Provisional data, (*) Data refers to Pomorskie region only; (**) UK data are not comparable with other countries due to the omission of indirect cost in the total labour cost;

(i) Data for 2005 are estimated by adding the corrected direct costs and labour costs of participants

For some of the Member States (12) it is possible to compare the results from the first survey carried out in 1993 with those of the surveys carried out in 1999 and 2005. In all countries except Greece, the spending on CVT courses as a proportion of total labour costs increased from 1993 to 1999. But the positive trend did not continue in these countries from 1999 to 2005.

Table 3.4: Total cost of CVT courses as percentage of total labour cost in all enterprises. 1993, 1999 and 2005

	1993	1999	2005p
EU	:	2.3	1.6
Belgium	1.4	1.6	1.6
Bulgaria	:	1.0	1.1
Czech Republic	:	1.9	1.9
Denmark	1.3	3.0	2.7
Germany	1.2	1.5	1.3
Estonia	:	1.8	1.6
Ireland	1.5	2.4	:
Greece	1.1	0.9	0.6
Spain	1.0	1.5	1.2
France	2.0	2.4	2.3
Italy	0.8	1.7	1.3
Cyprus	:	:	1.3
Latvia	:	1.1	0.8
Lithuania	:	0.8	1.2
Luxembourg	1.3	1.9	2.0
Hungary	:	1.2	2.6
Malta	:	:	1.8
Netherlands	1.8	2.8	2.0
Austria	:	1.3	1.4
Poland	:	0.8*	1.3
Portugal	0.7	1.2	1.1
Romania	:	0.5	1.1
Slovenia	;	1.3	2.0
Slovakia	:	:	1.8
Finland	:	2.4	1.5
Sweden	:	2.8	2.1
United Kingdom	2.7	3.6**	1.3
Norway	:	2.3	1.3

Data source: Eurostat (CVTS), Extraction date June 2008

(:) Missing or not available, (*) Data refers to Pomorskie region only; (**) UK data are not comparable with other countries due to the omission of indirect cost in the total labour cost;

One particular issue related to the cost of training is to capture educational expenditures at the workplace. The companies' net training costs are sizeable lower than the gross expenditure with the trainees as these are also productive workers which mean that accounting for the economic benefits reduces the gross costs considerably; it is worth investigating why so many firms choose not to train apprentices. Some studies investigating the cost-benefit ratio of apprenticeship training in companies have indicated that most apprentices offset the cost of their training during their apprenticeship period on the basis of the productive contribution of the work they perform. In countries with apprenticeship systems, as long as training regulations and the market situation permit a cost-effective training of apprentices, companies do not need specific labour

market regulations or institutions to offer training (Wolter S.C., J. Schweri and S. Muehlemann, 2006).

3.4 Improving the image and attractiveness of vocational education and training

The major importance of vocational education and training for individuals, enterprises and society is widely acknowledged, and is perceived as a key element of lifelong learning. Although the secondary and tertiary levels of education are reflecting the growing need to enhance human capital by raising levels of skills among the population, VET sometimes suffers from being poorly integrated in the education system. As recommended in the 2008 Joint Interim Report, further work must be done to improve the quality and attractiveness of VET and progress must be made in reducing obstacles to progression between VET and further or higher education (Council, 2008b).

The Council issued recommendations for more than half of the Member States relating to education and training, lifelong learning and skills development. In half of these cases, the recommendations address the need for further reforms of national education and training systems (reducing the number of early school leavers, reforming VET systems, developing lifelong learning strategies, implementing spending targets) while in the other cases, the recommendations address skills issues linked specifically to labour market needs and labour supply (training of older workers, skills levels of disadvantaged groups such as migrants).

One way to grasp the image and increased attractiveness of initial VET is to look at the students participation patterns by programme destination. In several European countries there has been a shift in provision and participation, away from vocational programmes giving access only to the labour market or other programmes at the same level to programmes that also give access to studies at the next levels. However in United Kingdom, Belgium or Norway half of the VET students (or more) are enrolled in upper secondary programmes that are designed to provide only access to the labour market and in Denmark, Spain, Malta and Iceland over 40% of the students are enrolled in this type of programme.

At the EU level the proportion of students who are enrolled in Type-A programmes at ISCED level 3 (which are designed to give access to vocational studies at the next level) went up by 4 percentage points to almost 61% in 2005 compared to 2000. The

increase was made on the expense of the Type-C programmes for which the enrolments dropped by 4 percentage points between in the same period whereas the proportion of students enrolled in Type-B programmes has remained constant over this period.

Table 3.5 Enrolment in upper secondary education (ISCED 3) by programme destination. 2005

	Enrolment		
	3A	3B	3C
EU	60.8	8.8	30.4
Belgium	49.5	:	50.5
Bulgaria	99.0	:	1.0
Czech Republic	70.3	0.4	29.3
Denmark	52.1	:	47.9
Germany	39.7	59.7	0.6
Estonia	10:	:	:
Ireland	71.4	:	28.6
Greece	64.0	:	36.0
Spain	57.5	:	42.6
France	57.5	10.4	32.1
Italy	80.8	2.9	16.3
Cyprus	10:	:	:
Latvia	91.1	0.1	8.8
Lithuania	99.4	:	0.6
Luxembourg	59.6	15.5	24.8
Hungary	76.8	:	23.2
Malta	57.6	:	42.4
Netherlands	61.8	:	38.2
Austria	43.6	47.1	9.3
Poland	88.3	:	11.7
Portugal	10:	:	:
Romania	72.8	:	27.2
Slovenia	32.6	44.4	23.0
Slovakia	80.7	:	19.3
Finland	10.0	:	:
Sweden	94.8	:	5.2
United Kingdom	43.6	:	56.4
Croatia	72.3	:	27.7
FYR Macedonia	90.5	:	9.5
Turkey	90.7	:	9.3
Iceland	50.6	0.6	48.8
Liechtenstein	36.0	62.7	1.2
Norway	39.2	:	60.8

Source: UOE, Eurostat

For notes see:

http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0.1136184.0_45572595&dad=portal&schema=PORTAL

The access to CVT courses remains unequal with older workers (aged 55 and over) less likely than young people to participate in CVT courses. Denmark, Finland and Norway are the only countries where workers aged 55 years and over participate more than those aged less than 25, while in Slovakia and the Czech Republic the percentages are the same for these two age groups. (see table 3.6). The older age group has an increased risk of social exclusion and income inequality than younger age-groups. Hence participation in CVT courses could help to avoid earlier exit from the labour market for this age-group which affects negatively the social protection systems.

Table 3.6 Training incidence by age in EU countries. 2005.

	-25 yrs	25-54	55+
EU	29	33	24
Belgium	35	41	28
Bulgaria	15	16	8
Czech Republic	54	60	54
Denmark	29	35	36
Germany	25	32	21
Estonia	25	26	15
Ireland	:	:	:
Greece	13	14	7
Spain	30	35	25
France	:	:	:
Italy	22	30	22
Cyprus	22	31	15
Latvia	16	15	8
Lithuania	17	15	9
Luxembourg	42	51	31
Hungary	12	17	9
Malta	29	34	24
Netherlands	26	38	23
Austria	36	34	21
Poland	16	22	13
Portugal	26	29	18
Romania	17	18	12
Slovenia	54	51	44
Slovakia	32	40	32
Finland	25	43	34
Sweden	39	50	37
United Kingdom	34	34	26
Croatia	:	:	:
FYR Macedonia	:	:	:
Turkey	:	:	:
Iceland	:	:	:
Liechtenstein	:	:	:
Norway	23	31	24

Data source: Eurostat (CVTS 3) Extraction date June 2008.

(:) missing or not available

Learning tends to lead to later learning. Inequality of opportunity in education is likely to be amplified by unequal opportunities in training. Estimates for the European Union confirm that the probability of employees to participate in CVT rises with the level of schooling. (European Commission 2007g)²⁵

3.4.1 Learning outcomes of vocational education and training students

Currently there is a lack of existing surveys measuring the learning outcome of VET. Direct internationally comparable results on learning outcomes of students (i.e. student achievements in basic subjects and competencies) are only available from TIMSS and PISA.²⁶ The PISA survey makes it possible to identify the score of 15 year-old students in foundation skills such as literacy and numeracy. For some countries (10 EU countries) PISA reports on the performance in mathematics divided into different programme orientations. For the mathematical literacy domain, the 15 year-old students enrolled in general programmes perform better than students enrolled in pre-vocational and vocational programmes. In the Netherlands,

Belgium, Greece and Hungary students enrolled in general programmes have a performance advantage of more than 60 points. The OECD underlines that "given that vocational and general tracking can often reflect social segregation in the education systems, it is also important to examine differences in performance after adjusting for socio-economic factors." (OECD 2007, p. 275). After adjusting for the socio-economic factors the performance gap is reduced for all countries where data are available. In Luxembourg and Portugal (not significant) students in vocational programmes perform better than students in general programmes for the mathematical literacy domain.²⁷

One should be aware however that internationally comparable large scale assessments programmes often concentrate on general competences (e.g. reading, information processing, numeracy and problem solving) whereas many employers argue that, in vocational education, the assessment domains should be sector- or work-specific skills, which are highly contextualised. In order to measure learning outcomes and to be able to measure if progress has been accomplished in development of skills there is an increasing need to conduct surveys which focus as well on the assessment of vocational skills and competences.

3.4.2 Other outcomes of vocational training

Avoiding early labour market difficulties is particularly important for youth as a rich literature shows that long unemployment experiences may have persistent effects on employment likelihood and wages later in life. Cooke (Cooke, L.P, 2003) analysed initial wage levels based on school quality and training track for two cohorts of non-university young adults. He found that vocational certification did predict higher wages for youth from different school tracks; for cohorts in which general education was more prevalent, formal vocational certification was an important predictor of higher initial wages for both high and low quality school tracks. By comparing the earnings five, ten and 13 years after labour market entry, he concluded that the returns to specific vocational training manifest in higher initial wages with apprenticeship predicting higher changes in wages within a time period. This pattern of higher initial returns holds for subsequent vocational certification can suggest the support for lifelong learning

While some research shows no beneficial effect of an extra year of basic vocational education on the long-term wages (suggesting equal gains from an extra year in vocational school as from an extra year of work experience (Oosterbeek H. and D. Webbink, 2007)) other evidences shows that the magnitude of the economic returns from CVT is sizeable compared to the benefits of formal education. The private returns of CVT measured as the effects on wages are roughly similar to the benefits of an additional year spent in formal education which are estimated at 5-15% (European Commission, 2006f). The results are debated in the literature, especially due to the duration of CVT which is shorter than the duration of formal education. Also, estimating the private returns in terms of wages is subject to various methodological and technical issues (for instance the participants in CVT are likely to have different characteristics which can be assessed differently (e.g. higher levels of schooling but also higher abilities). Along this line, some empirical studies show that the wage effects are generally lower for workers with low educational attainment than for their more educated counterparts (Bassanini et al., 2005).

Recent empirical findings provide further support for the idea that apprenticeships have a positive effect on early career unemployment outcomes. The dual systems²⁸ have proven quite successful in giving young people a good start in the labour market. OECD data shows that Austria, Denmark and Germany are among the countries with the lowest share of youth experiencing repeated unemployment spells; in Germany and Austria, where the apprenticeship system is well developed, more than half of those leaving school find a job without experiencing any unemployment (OECD, 2006a).

Evidence shows that effects of apprenticeship training on long-term employment outcomes and on post-apprenticeship wages are however more mixed. Van der Velden *et al.* (2001) show that European countries with apprenticeship systems enjoy better youth employment patterns, particularly in terms of larger employment share in skilled occupations and in high-wage sectors, than those with little or no apprenticeship. Along similar lines, Gangl (2003) carried out a study of labour market outcomes of different types of school work-based qualifications including apprenticeships for 12 European countries. He found that apprenticeships perform rather favourably both compared to school-based education at the same level of training and across different qualification levels. Gangl also reports that, after controlling for institutional and structural

factors, apprenticeship systems produce a significant reduction in early career unemployment rates. Ryan (2001) and Steedman (2005) put forward the argument that part of this effect may come through a better matching of training to labour market demand that results from apprenticeship training.

Regarding social returns, education has nonpecuniary benefits in terms of crime reduction or higher civic participation because it mainly improves the non-cognitive abilities of individuals for example motivation and discipline. Less evidence exists regarding to the social returns of CVT. Some results shows that CVT may induce positive externalities in the sense of individual learning opportunities (for instance one employee may benefit from another's knowledge acquired in the context of training). However, these positive externalities generated by participation in CVT are likely to be primarily within a company and difficult to be accounted for in the society as such. Moreover these externalities concern to a lesser extent the CVT for the employed but may be more significant when the employed persons become unemployed (European Commission, 2007g).

Appendix**Policy overview: Copenhagen-Maastricht-Helsinki**

Some concrete outcomes of the European cooperation in vocational education and training

Common European tools	Policy objective - contribution to Education and Training 2010	Stage of development (2008)
The European Qualifications Framework (EQF)	EQF contributes to the transparency, comparability and portability of citizens' qualifications. It is a common European reference framework which links countries' qualifications systems together, acting as a translation device to make qualifications more readable and understandable across different countries and systems in Europe.	The Recommendation on the European Qualifications Framework for lifelong learning was signed on 23 April 2008 by the Presidents of the European Parliament and of the Council. The recommendation invites Member States to relate their qualifications systems to EQF by 2010, and to refer all new qualification certificates, diplomas and Europass documents by 2012 to the appropriate EQF level.
A European Credit system for VET (ECVET)	ECVET aims at facilitating European mobility in VET and access to lifelong learning for young and adult learners. It supports the learners while building individual learning pathways leading to qualifications. It provides a common methodological framework based on units of learning outcomes so as to facilitate transfer of credits between qualifications and VET systems.	The European Commission has finalised its proposal for a recommendation of the European Parliament and of the Council on the establishment of the European Credit system for Vocational Education and Training (ECVET) on 09 April 2008. An agreement on the ECVET recommendation is expected by the end of 2008.
Common Quality Assurance Framework for VET	To promote cooperation on quality assurance in VET between Member States by providing a guarantee for quality assurance in VET. Member States will be encouraged to exchange models and methods in this field.	The European Commission adopted on 9 April 2008 a proposal for the recommendation of the European Parliament and of the Council concerning the establishment of a European Quality Assurance Reference Framework for Vocational Education and Training (EQARF-VET).
A single Community framework for the transparency of qualifications and competences (Europass)	To improve transparency of qualifications and competences which will subsequently facilitate mobility throughout Europe for lifelong learning purposes, thereby contributing to developing quality education and training and facilitating mobility for occupational purposes, both between countries and across sectors.	Adopted by a Decision of the European Parliament and of the Council in December 2004. Europass is implemented in 32 countries. The Europass website, developed by Cedefop, recorded 10 millions visits. 2.5 million CVs were completed online. A first external evaluation, conducted in 2007, concluded that the Europass initiative is achieving its objectives as a mobility tool for citizens and helps them to make their competences and qualifications easier to understand learning contexts and the labour market. The Commission prepared a communication to the Council and the European Parliament.
Common European principles for identification and validation of non-formal and informal learning	Common European principles are necessary to encourage and guide development of high-quality, trustworthy approaches and systems for identification and validation of non-formal and informal learning.	The Education Council has endorsed a set of common European principles for identification and validation of non-formal and informal learning. A European Inventory on validation of non-formal and informal learning has been set up to support implementation of the common principles and to promote mutual learning between European countries. The Cedefop Virtual Community on non-formal learning provides a platform for dissemination of and further exchanges on the common principles and their further development.
Lifelong guidance	Guidance throughout life contributes to achieving the European Union goals of economic development, occupational and geographical mobility and human capital and workforce development. Provision of guidance within the education and training system, and especially in schools or at school level, has an essential role to play in ensuring that individuals' educational and career decisions are firmly based and in assisting them to develop effective self-management of their learning and career paths.	The Resolution adopted by the Council in 2004 invites Member States to examine national guidance provision in education, training and employment. A template for action to support Member States in this process was devised. Additionally, a <i>Career guidance handbook for policymakers</i> was published by the OECD and the Commission in December 2004. It provides common principles and other tools to improve services at national, local and company levels. The European lifelong guidance policy network ELGPN was established in 2007 to assist the Member States and the Commission in moving European cooperation on lifelong guidance forward in both education and the employment sectors. The purpose is to promote cooperation at Member States level on lifelong guidance and to propose appropriate structures and support mechanisms in implementing the priorities identified in the Resolution (2004)
VET statistics	Adequate and consistent data and indicators are the key to understanding what is happening in VET, to strengthening mutual learning, to supporting research and to laying the foundations for evidence-based training policy.	Cooperation is underway between different Commission DGs (EAC, JRC/CRELL and Eurostat) and Community agencies (Cedefop and Eurydice) with the aim of developing a framework for reporting on VET.

Source: European Commission (Directorate General Education and Culture), Cedefop (www.cedefop.europa.eu)

NOTES

- ¹ Due to changes in the PISA tests, the number of test-items changes according to the focus areas of the surveys. In 2000 reading was the major domain. Reading will be the major domain in 2009 and hence provide more reliable estimates of trends compared to the results in 2000 than the results from 2003 and 2006.
- ² See the Joint Employment Report 2007/2008 and the Council Decision 2005/600/EC of 12 July 2005 on guidelines for the employment policies of the Member States.
- ³ The Eurostat Classification of Learning Activities is one of the tools required for key statistical measurement of lifelong learning issues intended to cover all types of learning opportunities and education and learning pathways. The classification is designed to serve as an instrument for compiling and presenting comparable statistics and indicators on learning activities both within individual countries and across countries. It was constructed to be applied to statistical surveys to collect quantitative information on different aspects of participation of individuals in learning. It covers all intentional and organised learning activities for all age groups. The definition of lifelong learning remains consistent with the ISCED where learning is understood to be “any improvement in behaviour, information, knowledge, understanding, attitude, value or skills”. While ISCED describes learning by the intended outcome, in the Classification the focus is on the activities of learning. (European Commission, 2006h) The Classification of Learning Activities has been originally designed to serve the scope of the European Union Adult Education Survey.
- ⁴ Caution is required when school life expectancy is used for inter-country comparison; neither the length of the school-year nor the quality of education is necessarily the same in each country.
- ⁵ This indicator refers to persons aged 25 to 64 who stated that they received education or training in the four weeks preceding the survey (numerator). The denominator consists of the total population of the same age group, excluding those who did not answer to the question 'participation to education and training'. Both the numerator and the denominator come from the EU Labour Force Survey. The information collected relates to all education or training whether or not relevant to the respondent's current or possible future job.
- ⁶ Data for 2003 are break in series for most of the countries as a result of changes in definitions. Also, from 2006 onwards, the calculations are made based on annual averages instead of one unique reference quarter. In most of the countries the annual and quarterly results are not significantly different.
- ⁷ See Chapter 4 on Key competences.
- ⁸ See chapter 8 on Employability.
- ⁹ See chapter 1 on Equity
- ¹⁰ Indicator: Percentage of those aged 22 who have successfully completed at least upper secondary education (ISCED level 3). For statistical reasons (the sample size in the Labour Force Survey for a one-year cohort is too small to produce reliable results) the following proxy indicator is used in the analysis: Percentage of those aged 20-24 who have successfully completed at least upper secondary education (ISCED level 3).
- ¹¹ Unless otherwise specified, the figures are derived from Eurydice (2005a).
- ¹² For an exhaustive description of the models currently adopted in Europe please see: Atkinson, M. et al (2005a).
- ¹³ I.e. the knowledge available at local level is relevant and substantially different from the information available at centralised level.
- ¹⁴ See Paletta & Vidoni 2006, partly derived from Bush, 2000.
- ¹⁵ The construct socioeconomic status (SES) is defined as the relative position of a family or individual in a hierarchical social structure, based on their access to, or control over, wealth, prestige and power (Mueller & Parcel, 1981). In many education and health surveys, it is operationalised as a composite measure built on the level of education of the parents, their income and occupational prestige (Dutton & Levine, 1989).

The aspect of family SES under analysis is the cultural capital which depends mostly on the highest level of education pursued within the family. The report on the project can be downloaded from: <http://crell.jrc.ec.europa.eu>.

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- ¹⁶ If this data are compared with those published by the PISA study it is important to note that EUROSTAT reports numbers of students on ISCED 1-4 while PISA only reports students aged 15 and definitions might vary slightly¹⁶. In general terms, there are no substantial differences, except in the case of the UK where PISA reports 98% of students in public schools while EUROSTAT reports only 59%; and Ireland, with 40% in PISA and 99% in EUROSTAT (Ireland reports catholic schools that are publicly financed as public).
- ¹⁷ Teachers' professional development is among the sixteen core-indicators adopted by the Council for monitoring progress. Presently, an international survey is on-going (the OECD/TALIS survey that will provide the necessary data. (See Part C of below).
- ¹⁸ Common European Principles for Teacher Competences and Qualifications:
http://ec.europa.eu/education/policies/2010/doc/principles_en.pdf.
- 2006 Joint Interim Report of the Council and the Commission on progress under the Education and Training 2010 work programme (2006/C 79/01), p. 8.
- Conclusions of the Council and the Representatives of the Governments of the Member States, meeting within the Council, on efficiency and equity in European education and training systems (2006/C 298/03), p. 2.
- ¹⁹ The question was: "In your school, how many computers are used for educational purposes for pupils, either to use alone or with a teacher? Please do not include computers that are only accessible to teachers or staff members." Indicator: % of schools answering "1" or more to Q6. Source: Empirica: LearnInd 2006 (HTS).
- ²⁰ For Portugal education expenditure at local government is not included in the data, this affects mainly primary education and can hence distort the difference between spending on primary and on secondary level
- ²¹ Isced 5A includes programmes which are theoretically based/research preparatory (history, philosophy, mathematics, etc.) or giving access to professions with high skills requirements (e.g. medicine, dentistry, architecture, etc.), while 5B are programmes which are practical/technical/occupationally specific. (See UNESCO International Standard Classification of Education I S C E D 1997)
- ²² This indicator is based on the UOE data collection. In some countries the differences in coverage between the two data sources (UOE and LFS) can be sizeable for the completion of upper secondary education. Starting with 2006, Eurostat implements a refined definition of the educational attainment level 'upper secondary' in order to increase the comparability of results in the EU.
- ²³ It should be noted that much of this reduction comes from the reduced figures for the UK from a share of 67.3% in 2000 to 41.7% in 2006. This represents a reduction of 2.5 million students. The data should be interpreted with caution since there is a break in the series.
- ²⁴ ISCED 3 corresponds to the final stage of secondary education in most EU countries. The entrance age to this level is typically 15 or 16 years and the typical duration of programmes range from 2 to 5 years of schooling. The ISCED level 3 programmes are sub-classified according to the destination for which the programmes have been designed to prepare pupils.
- ²⁵ Discrimination in vocational training is already covered and forbidden by Directive 2000/78/EC establishing a general framework for equal treatment in employment and occupation.
- ²⁶ Programme for International Student Assessment-PISA (OECD) and Trends in International Mathematics and Science Study-TIMSS (IEA)
- ²⁷ Source: OECD PISA 2003 database, Table C1.3. PISA presents data for countries with more than 3% of students in the aggregated category of pre-vocational and vocational programmes.
- ²⁸ Systems where class-based and work-based training are provided in parallel are known as "dual" systems. In a "dual" system framework-typical of Austria, Denmark, Germany and more recently Norway-youths spend some time in educational institutions and the remainder at the workplace. Apprenticeships are then part of the formal educational structure, and are usually entered into after completion of compulsory education. They involve an employment relationship *plus* formal schooling-normally one and a half to two days per week-over a period of three or sometimes four years. At the end of the programme, apprentices graduate through a final examination in which they have to prove their theoretical and practical grasp of the occupation concerned.