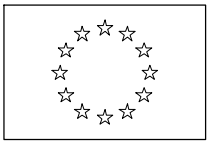

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PROGRESS TOWARDS THE COMMON EUROPEAN OBJECTIVES IN EDUCATION AND TRAINING

Indicators and benchmarks 2010/2011

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PREFACE

This is the 7th annual report examining performance and progress under the European Union's Education and Training 2010 Work Programme which was launched following agreement within the Council of Education Ministers in 2001. The new *strategic framework for European cooperation in education and training* (known as ET 2020) adopted by the Council in May 2009 will carry on the work between now and 2020

The purpose of this report is to provide data and research findings to underpin this policy co-operation at European level. The core of the report consists of an analysis of the progress made towards the common objectives agreed by the Council as the basis for this cooperation. The report reviews both the benchmarks agreed in May 2003 as the basis to monitor progress until 2010; and the updated set of benchmarks to be used to monitor progress until 2020 which were adopted by the Council in May 2009. It is compiled by the Commission services using existing data series and research findings. Member States, through the Standing Group on Indicators and Benchmarks (SGIB; see Annex 1) are invited to verify the data during compilation of the report.

The report also reflects the creation during 2010 of the EU's Europe 2020 Strategy for its socio-economic development to 2020. Two of the five benchmarks for ET 2020 – to reduce the number of early school leavers; and to increase the share of young adults holding tertiary education qualifications – have been made headline targets of the process in respect of which Member States are expected to set national targets and outline policies to achieve these. In addition, Europe 2020 envisages a series of seven flagship initiatives of which two actions adopted during 2010 relate strongly to education and training, namely "Youth on the Move" and "An Agenda for New Skills and Jobs". The Commission furthermore adopted in December 2010 a communication on a further flagship initiative which will have important educational content, the "European Platform against Poverty". The focus on education and training within Europe 2020 has huge potential to influence the future of Europe's systems and this report accordingly pays particular attention to the issues addressed in both the headline targets and the flagship actions.

The report analyses performance and progress of education systems in EU member states (27), candidate countries (3) and associated countries (3) and how they contribute towards meeting Europe's Lisbon objectives. World reference levels of performance are used in certain areas.

The report shows that examples of good performance and progress can be found throughout Europe that have the potential to inspire others for improvement. At the same time, educational systems in many Member States continue to show signs of struggling in the face of major challenges. The Report helps therefore to point to possible areas for the exchange of information, experience and mutual learning, the core purpose of ET 2020, and where concerted action across Member States, as envisaged under Europe 2020, could transform Europe's educational performance. It also points to the scope for further improving the framework of indicators and benchmarks and the evidence base for policy making.

Reflecting the strategic framework for future European cooperation in education and training adopted by the Council in May 2009, the report is structured in four chapters in line with the four strategic objectives of the framework, as follows:

1. Making lifelong learning and mobility a reality;
2. Improving the quality and efficiency of education and training;
3. Promoting equity, social cohesion and active citizenship;
4. Enhancing creativity and innovation, including entrepreneurship, at all levels of education and training.

CONTENT LIST

TWELVE MAIN MESSAGES OF THE REPORT (2010)

1. **Educational performance improved since 2000 in all five areas for which benchmarks for 2010 were agreed by European Education ministers (early school leavers; low achievement in reading; upper secondary completion; maths, science and technology graduates; adult lifelong learning)..** Nevertheless, the benchmarks will not be achieved, apart from the benchmark on increasing the number of math, science and technology graduates.

2. **Looking forward to the benchmarks set for 2020 (participation in early childhood education; low achievers in reading, maths and science; early school leavers; tertiary attainment; adult lifelong learning), past trends would suggest that most of these will be attainable, albeit with extra policy effort for some.**

3. **Two of the five benchmarks for 2020 have been given higher political status as headline targets of the Europe 2020 strategy, namely: the share of the young adult population holding tertiary or equivalent degrees should reach 40%; and the share of early leavers from education and training should be less than 10%.** An analysis of trends would suggest these are achievable. Nevertheless, the preliminary national targets for their achievement set by several Member States in their draft national reform programmes are somewhat conservative, suggesting that the future rate of progress may be less than what is required.

4. **Participation in early childhood education is increasing.** Pre-school participation (4 years- start of compulsory schooling) has increased by 6 percentage points since 2000 to reach over 92% of young children**.**

5. **The share of low achievers in reading literacy among pupils in lower secondary education in the EU has decreased.** From 2000 to 2009 the proportion of low performers in reading literacy aged 15 decreased from 21.3% to 20.0% (after having had increased to 24.1% in 2006). This still falls short of the benchmark set by the Council for 2010, equivalent to a rate of 17%.PISA 2009 results show that performance for reading, mathematics and science has improved in a number of EU countries which had previously performed below average. Nevertheless there are widespread and very high gaps in performance linked to socio-economic status and between native pupils and pupils with an immigration background.

6. **Vocational programmes play an important role in reducing the share of young people who are not employed nor participating in education and training (NEETs), and vocational programmes have been successful in some member states to reduce early school leaving.**

7. **Learning mobility of young people is increasing but it remains far from being an opportunity open to all young people. It is best developed in third-level education, where more than half a million EU students study outside their country of origin,** most in another EU country. This is an increase of over 50% since 2000. Learning mobility remains markedly lower in vocational education.

8. **Participation in adult lifelong learning improved in the period 2000-2005 but has since slightly declined and currently reaches a level short of the benchmark of 12.5% agreed for 2010 and significantly below the 15% target for 2020.**

9. **Early teaching of foreign language is advancing in Europe**. In lower secondary education, earlier teaching of English is becoming widespread. Moreover, the average number of foreign languages taught per pupil in upper secondary school education has progressed since 2000, but still falls short of the Barcelona objective of 2 languages per pupil. Language learning within vocational education has grown but remains substantially below general education.

10. Gender gaps remain significant in education – in performance (girls outperform boys very sharply in reading), in subject choice (men outnumber women among MST graduates) and in patterns of educational participation (boys outnumber girls in VET) and non-participation (boys are predominant among early school leavers).

11. Public spending on education as a percentage of GDP has stagnated since 2000 and the volume of private spending, which plays such as important role in the US, especially in higher education, has hardly changed. **The EU member states would need to invest on average over 10.000 euro more per student per year (or almost 200 billion euro a year) in higher education to reach the levels of the US.**

12. The economic crisis has affected people differently depending on their level of education, with a stronger impact on those with low educational attainment. Low-skilled males have experienced the most severe downturn in their employment prospects.

Introduction

1. Introduction

In May 2009 the Council agreed an updated *strategic framework for European cooperation in education and training* as a basis to carry on the cooperative exchange on policies which had been initiated in 2001 under the umbrella of the Lisbon strategy for jobs and growth. The framework for policy cooperation, known as Education and Training 2020, will also serve as the principal mechanism to feed high-level education policy messages into the European Union's Europe 2020 Strategy to mobilise policies across the board for smart, sustainable and socially inclusive growth.
Member States and the Commission working in this way use indicators and benchmarks to inform and guide evidence-based policy making and as a means to monitor progress, both at the EU and national levels towards commonly agreed strategic objectives for education and training. The Council in 2003 adopted 5 benchmarks, to be achieved by 2010, to underpin this work of policy exchange.

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.

In May 2009 when re-launching the process for the decade ahead, the Council adopted a renewed set of benchmarks to be achieved by 2020. There is by and large continuity with the earlier set of benchmarks. However, there will be new benchmarks on early childhood education and on tertiary attainment among the young adult population; a broadening of the benchmark on low reading achievement to cover mathematics and science; confirmation of the benchmarks for early school leaving and adult participation in lifelong learning, with an increase in the target level for the latter. The 2010 benchmark on increasing the completion rate of upper secondary education has been discontinued on the basis that it is closely linked to the maintained benchmark on early school leaving.

Five EU benchmarks for 2020
§ at least 95% of children between 4 years old and the age for starting compulsory primary education should participate in early childhood education;
§ **the share of early leavers from education and training should be less than 10%;**
§ the share of low-achieving 15-years olds in reading, mathematics and science should be less than 15%;
§ **the share of 30-34 year olds with tertiary educational attainment should be at least 40%**
§ an average of at least 15 % of adults should participate in lifelong learning.

Furthermore, two of these five benchmarks – to reduce the number of early school leavers; and to increase the share of young adults holding tertiary education qualifications (they are shown in bold in the above list) – have been given further importance having been selected headline targets for the Europe 2020 for socio-economic development to 2020. These benchmarks link education and the labour market and have great importance for employability and jobs.

The main focus of this report is to analyse the progress that has been made in relation to the five benchmarks for 2010; and to take a first look at the trends and prospects for achieving the 2020 benchmarks. In addition, the analysis will draw where appropriate on the wider framework of 16 indicators which the Council agreed in May 2007 as a means to supplement the analysis of education systems. This wider framework allows for discussion of issues which have formed an important part of the policy exchanges between the Commission and Member States but which are not the subject of benchmarks, such as the role of teachers and trends in investment in education.

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

The Introduction section presents summary data on progress towards the 2010 benchmarks and reviews trends and prospects for achieving the 2020 benchmarks, paving the way for more detailed treatment of the different policy areas later in the report. It also sets out important information on the context for education policy making related to demographic development and trends in educational investment.

2. The European benchmarks for 2010 and 2020

2.1. The five benchmarks for 2010: progress made and gaps remaining

It will not be possible to make a final assessment of progress towards the 2010 benchmarks until all data are available. Broadly, there has been progress over the period since 2000. However, only one benchmark has been met; in relation to the other four, progress has been made but will not be / was not sufficient to meet the agreed target.

The benchmark on mathematics, science and technology graduates was already reached by 2005. Indeed, by 2009, growth in the number of new maths, science and technology graduates was more than twice the level needed to meet the benchmark.

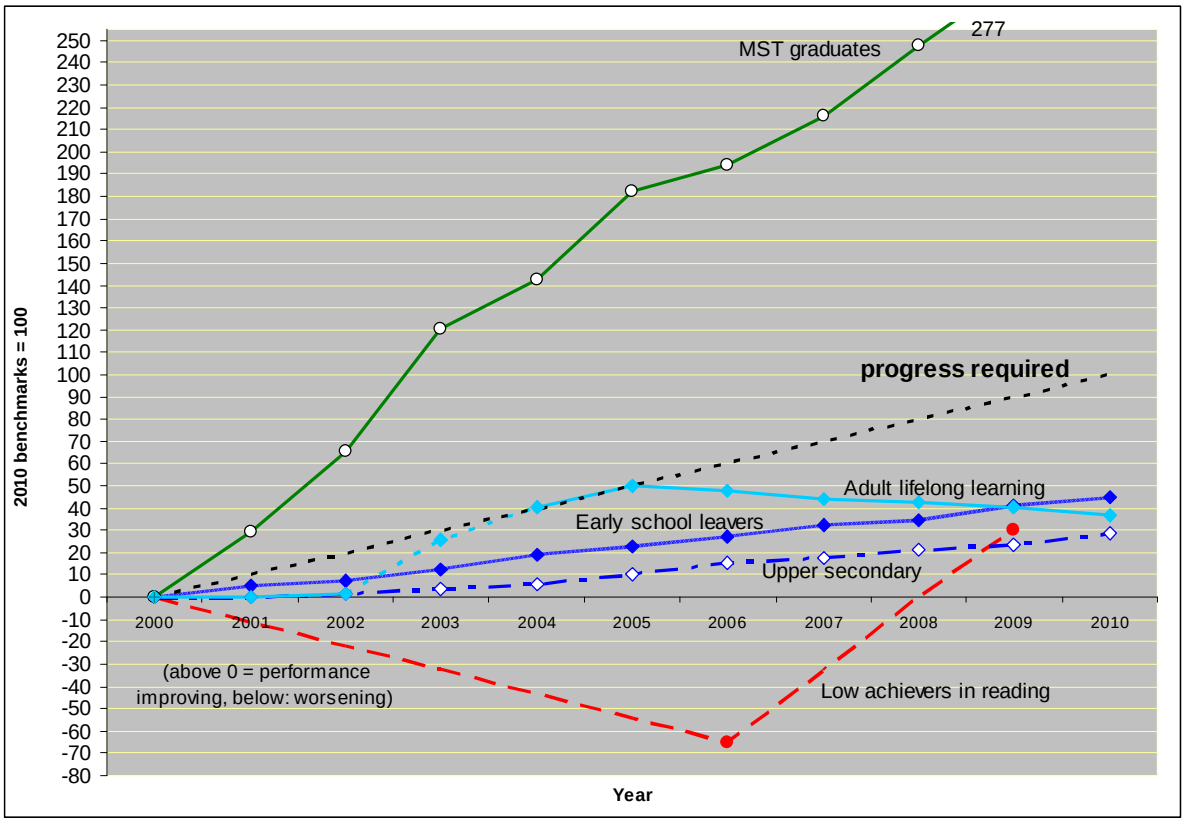
Slow progress has been recorded on early school leaving and completion of upper secondary education, insufficient to meet the targets.

Adult participation in lifelong learning progressed reasonably well until 2005 but has declined since then.

Performance on reading literacy of young people deteriorated in the period to 2006. Most recent data for 2009 show a good improvement which is, however, not sufficient to meet the target for 2010.

A more detailed presentation of the individual benchmarks is provided in Figures Int.2.2 to 2.6.

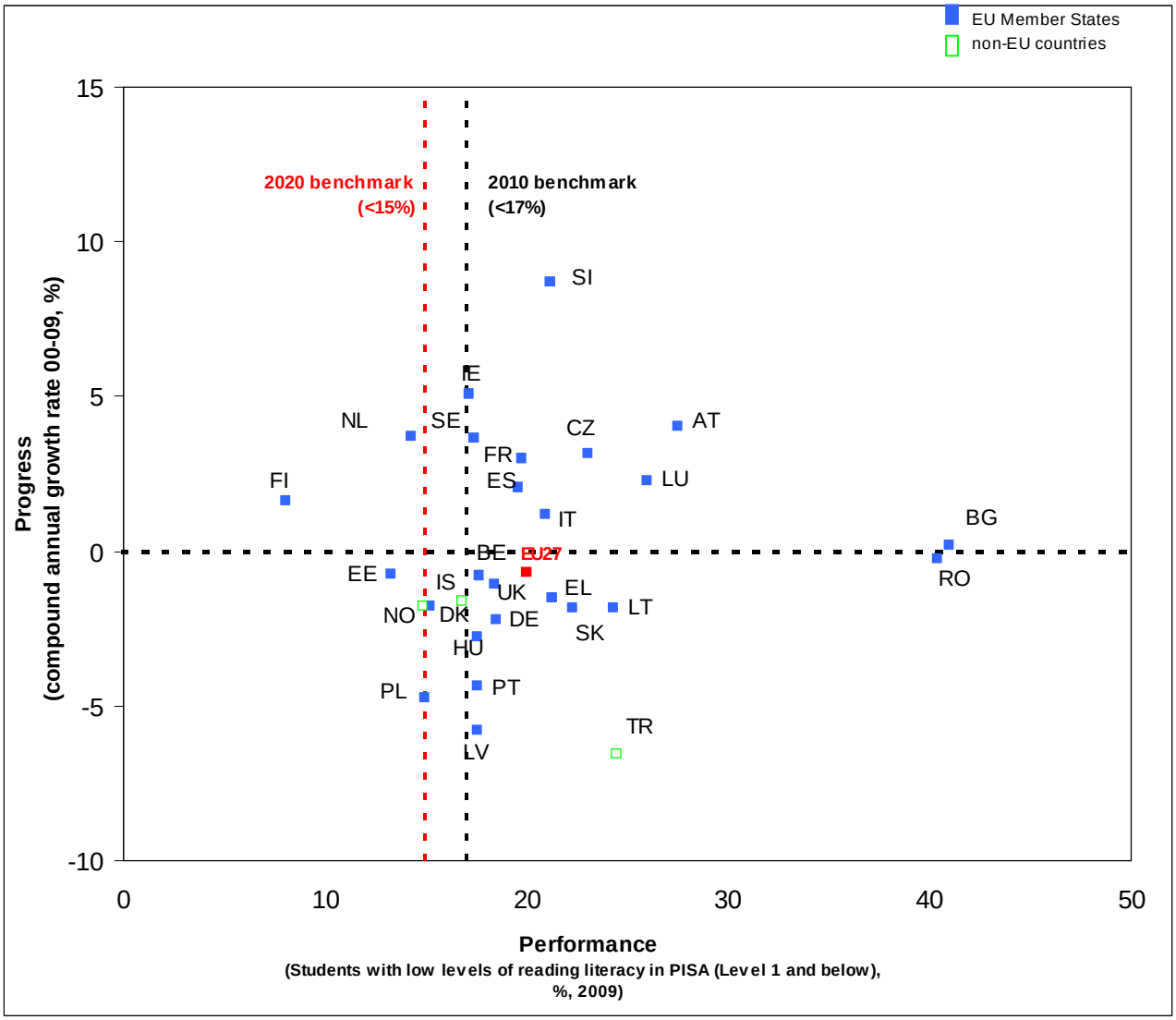
Figure Int.2.1: Progress towards meeting the five benchmarks for 2010 (2000-2010)



Source: European Commission DG EAC

In this figure 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 adult lifelong learning participation is dotted. For low achievers in reading (data from the PISA survey) there are comparable results for 18 EU countries for only three data points, 2000, 2006 and 2009.

Figure Int. 2.2: Benchmark 2010 - Low Performers in reading literacy (2000-2009)



Source: European Commission, DG JRC/Crell, based on OECD PISA data

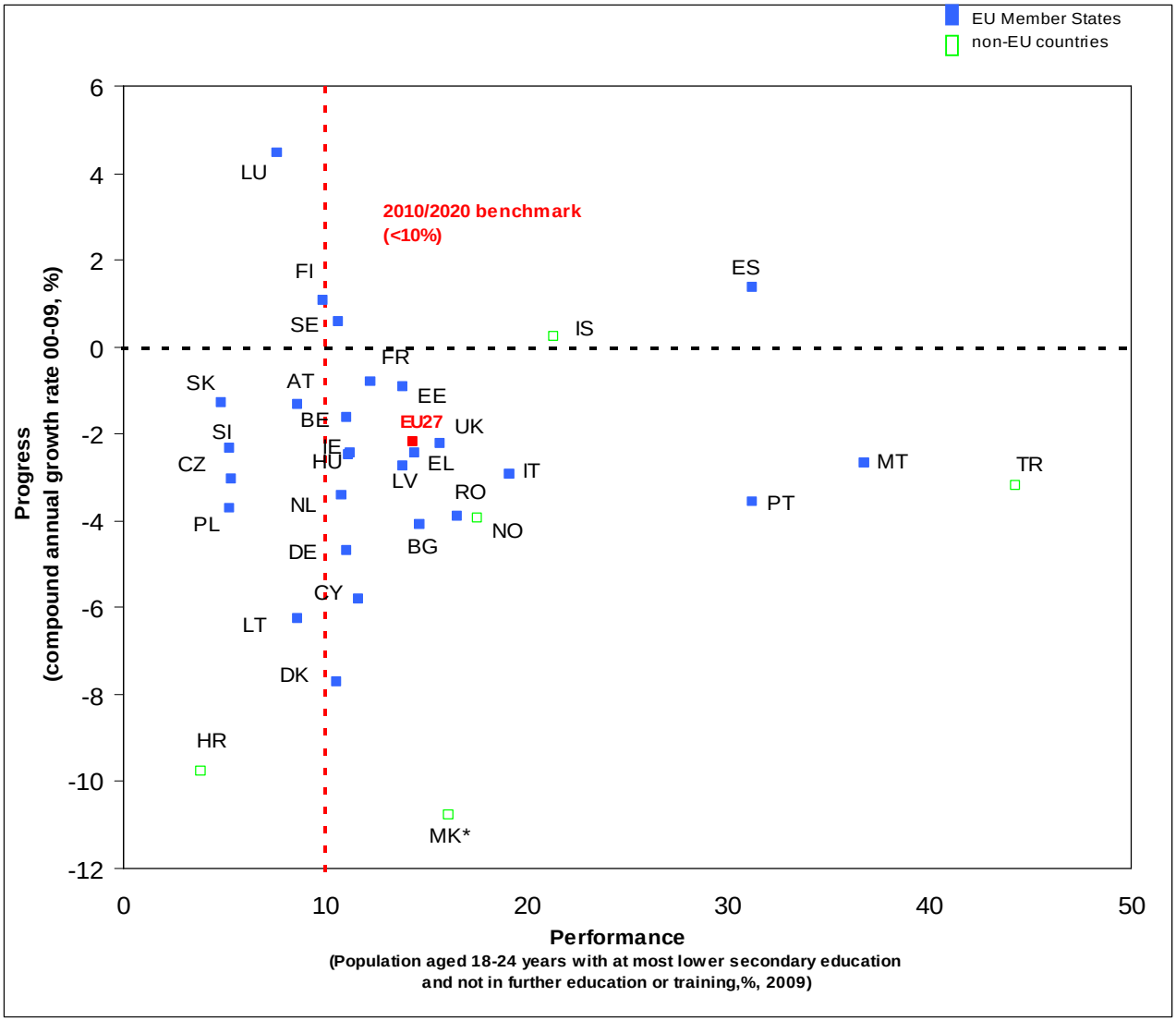
Notes:
Cyprus, Malta, The former Yugoslav Republic of Macedonia: PISA data not available (countries not displayed)
Estonia, Lithuania, Slovenia, Croatia (Progress in 2006-2009, 2000m, 2003m)
Luxembourg, Netherlands (Progress in 2003-2009, 2000u)
Romania (2003m)
Slovakia, Turkey (Progress in 2003-2009, 2000m)
United Kingdom (Progress in 2006-2009, 2000u, 2003m)

Countries in the lower left quadrant have above EU benchmark level performance (low share of low achievers) and have been successful in reducing this share further in the past, while countries in the upper right quadrant have below EU benchmark performance and have not been successful in reducing this share in the past.

In seeking to drive an improvement in Europe's performance in relation to low performers in reading literacy, the Council had proposed in 2003 that the rate be reduced by at least 20% by 2010 (i.e. to reach 17% from its 2000 level of 21.3%). The rate stood at 20.0% for 2009 (a reduction of only 6% compared to 2000; comparable data available for 18 countries). The best performing country in reading in 2009 was Finland, with only 8.1% low performers, followed by Estonia and the Netherlands, which also had less than 15% low performers in reading. Performance in the period 2000-2009 improved most in Latvia, Poland and Portugal.

The benchmark has been expanded for 2020, to cover also low performance in mathematics and science, with the rate of low achievement to be reduced by 2020 to no more than 15 %. See section 2.2 below.

Figure Int. 2.3: Benchmark 2010 - Early leavers from education and training (2000-2009)



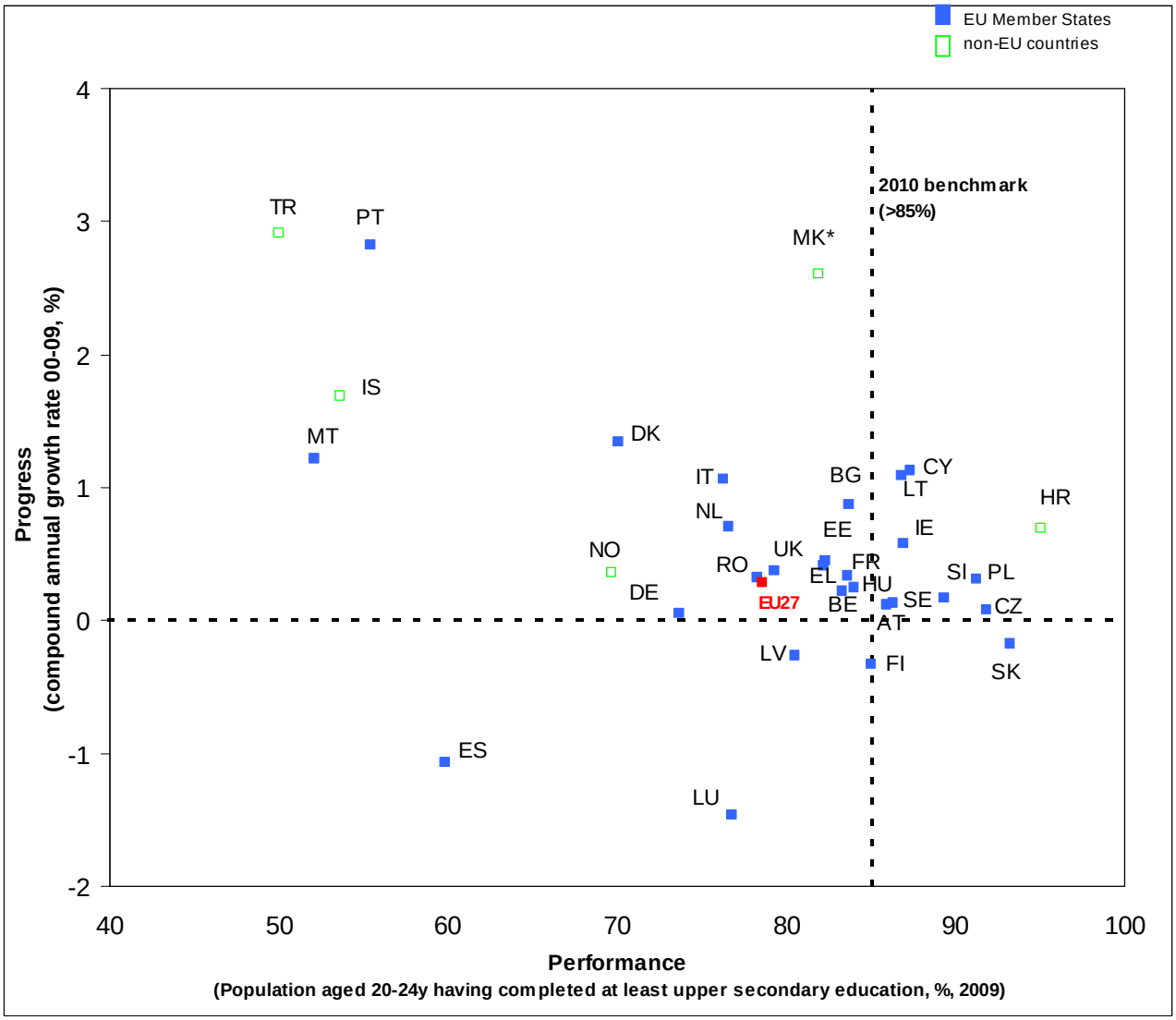
Source: European Commission, DG JRC/CRELL

Notes:
b: break in series; m: missing, u: unreliable/uncertain
Slovenia, Croatia: results are uncertain due to small sample size
*MK: The former Yugoslav Republic of Macedonia; see Annex 2
Malta, Portugal and Spain are the only EU27 countries with more than 30% early school leavers (all other EU countries have less than 20%).

Countries in the lower left quadrant have above EU benchmark level performance (low share of low achievers) and have been successful in reducing this share further in the past, while countries in the upper right quadrant have below EU benchmark performance and have not been successful in reducing this share in the past.

This key benchmark – the importance of which has now been highlighted further as a headline target of Europe 2020 – on early leavers from education and training proposed that by 2010 less than 10% of young people (aged 18-24) should be in this group. Figure Int. 2.3 shows that in 2009 the EU 27 rate still stood at 14.4%. Significant progress has been made by many countries and especially by Croatia, Denmark and Lithuania, all of which already perform better than the benchmark level. In addition, a number of Europe's poorest performers, notably Malta, Portugal and Turkey, have decreased their share of early school leavers significantly. However, overall progress in relation to this area has only been moderate.

Figure Int. 2.4: Benchmark 2010 - Upper Secondary Education (2000-2009)



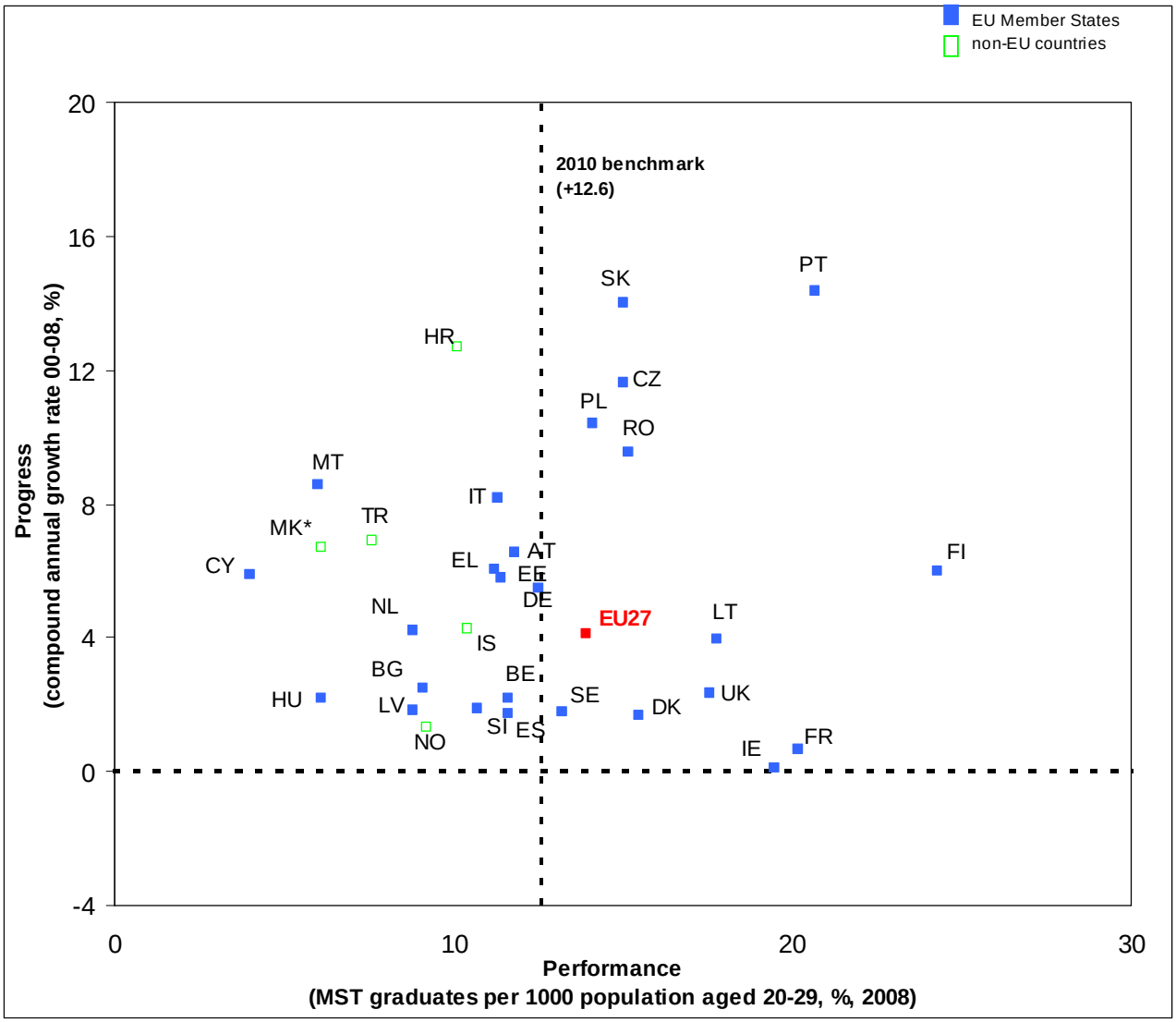
Source: European Commission, DG JRC/CRELL

Notes:
Breaks in series in Bulgaria (2001), Denmark (2003), Germany (2005), France (2003), Latvia (2002), Lithuania (2002), Luxembourg (2003), Hungary (2003), Malta (2003)
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Countries in the upper right quadrant have above EU benchmark level performance (high share of upper secondary attainment) and have been successful in reducing this share further in the past, while countries in the lower left quadrant have below EU benchmark performance and have not beensuccessful in increasing this share in the past.

The benchmark on upper secondary attainment proposed that by 2010 85% of young people (aged 20-24) should have completed secondary level education (Figure Int. 2.4). EU performance by 2009 stood at 78.6%, and hence was well short of the target. Luxembourg and Spain are losing momentum with a decrease in performance while still relatively far from the benchmark level. Croatia is showing the strongest performance, while Turkey and Portugal are progressing notably, even though both are quite far from the benchmark level. Among EU Member States, the Czech Republic, Slovakia, Poland and Slovenia show the best performance. This benchmark has been discontinued for the period to 2020; however, there is a close relationship with the maintained benchmark on early school leaving, the importance of which has been underlined as a Europe 2020 headline target.

Figure Int.2.5: Benchmark 2010 - Mathematics, Science and Technology Graduates (2000-2007)



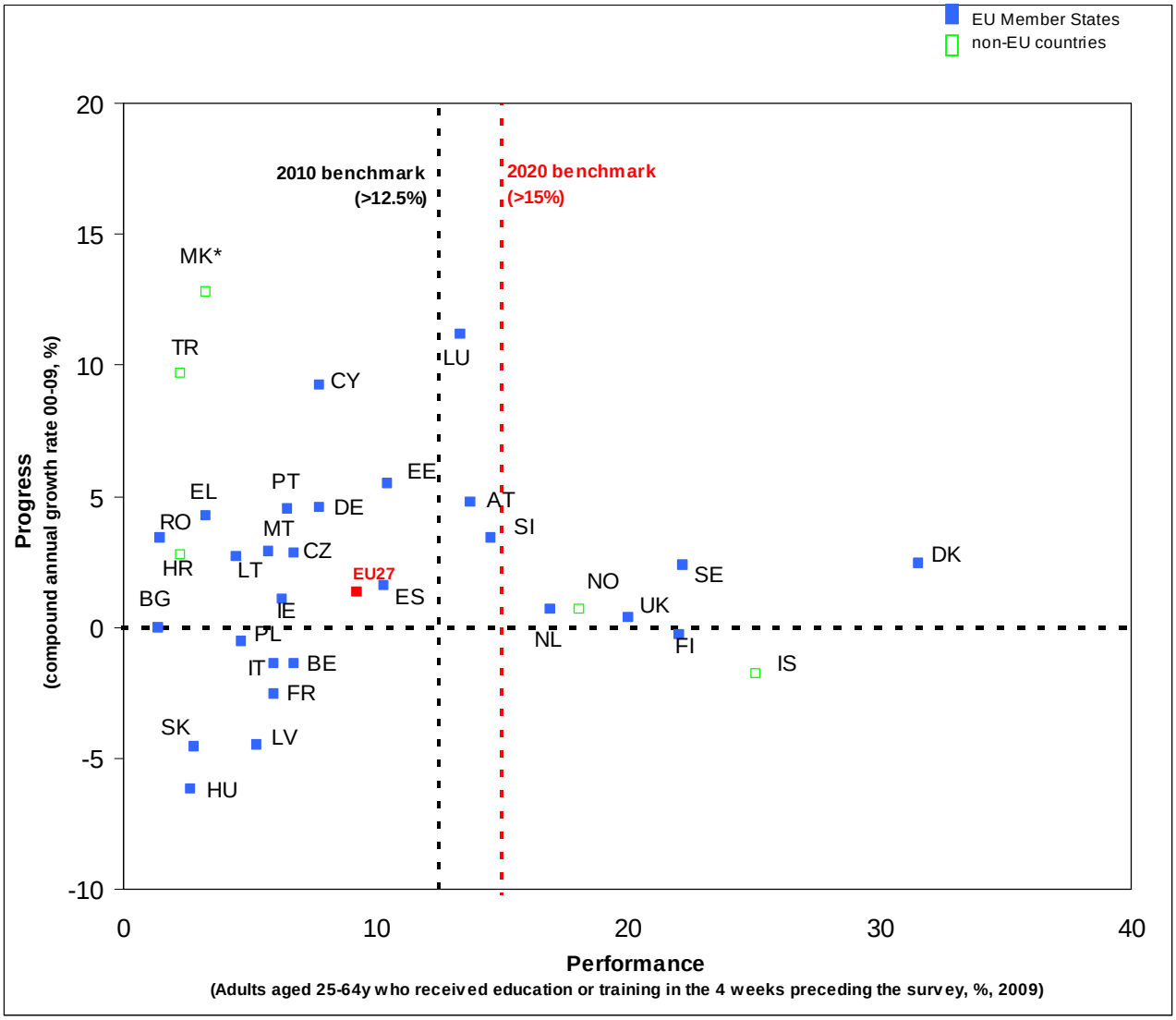
Source: European Commission DG JRC/CRELL

Notes:
Breaks in series in Latvia, Poland, Romania and the UK, incomplete series for Greece and Luxembourg
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Countries in the upper right quadrant have a number of MST graduates per 1000 people aged 20-29 that is above the level that is implied by the benchmark (a 15% growth rate) and have been successful in increasing their performance in the past, while countries in the lower left quadrant have below EU performance in terms of MST graduates/1000 young people and have not been successful in increasing this share in the past (currently there are no countries in the latter category, since all experienced growth).

The benchmark on Mathematics, Science and Technology proposed that there should by 2010 be a 15% increase in the number of graduates as compared with 2000 (corresponding to 12.6 MST graduates per 1000 young people aged 20-29), as shown by the vertical line on the x-axis of the graph. By 2008 the overall number of MST graduates in the EU had already increased by more than 37%, and in 21 EU Member States cumulative growth had already exceeded the 15% benchmark. In the Czech Republic, Poland, Portugal and Slovakia the number of tertiary MST graduates more than doubled since 2000. The number of MST graduates increased in all EU Member States. Hence all countries (except Ireland) were either catching up or moving ahead (above the EU target level of 12.6 graduates per 1000 young people and still growing).

Figure Int.2.6: Benchmark 2010 - Adult Lifelong Learning participation



Source: European Commission, JRC/CRELL calculations based on LFS data

Notes:
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Countries in the upper right quadrant have performance above the level of the EU benchmark (high share of adults participating in lifelong learning) and have been successful in increasing this share further in the past, while countries in the lower left quadrant have below EU benchmark performance and have not been successful in increasing this share in the past.

Increasing the participation by adults in lifelong learning is a highly important policy objective, the importance of which is underlined by the focus on constantly updating and renewing skills in the New Skills and Jobs flagship action of the Europe 2020 strategy. The 2010 benchmark on Adult Lifelong Learning Participation envisages that 12.5% of the adult population should participate in lifelong learning, as measured by the Labour Force Survey. Figure Int. 2.6 shows that the EU has now reached a participation rate of 9.3%. Even though this is well short of the 2010 benchmark level, many countries showed a solid improvement in their performance in the first half of the decade. Performance has, however, slightly declined since 2005. Best performers, with a participation rate of over 20%, are the Nordic countries (Denmark, Sweden Finland and Iceland) and the UK. Bulgaria, Romania and Greece show the lowest participation rates, but performance in these countries is tending to improve.

On the other hand Hungary and especially Slovakia perform well below the benchmark level and their adult lifelong learning participation rates are tending to decline.

For 2020, the target level in relation to this indicator has been increased to 15%.

2.2. Looking forward to the 2020 benchmarks

Progress towards achieving the new 2020 benchmarks can not yet be monitored, since the latest data refer to the time before these benchmarks were adopted. However, looking at progress in the period 2000-2009 can help to see if the current trajectory of progress would point towards reaching the EU benchmarks in the future. In addition, the benchmarks on early school leavers and the new benchmark on tertiary attainment are now the subject of national targets within the Europe 2020 process. First, provisional targets have been delivered by Member States in draft National Reform Programmes, which allow for a tentative assessment of the likelihood that the EU targets for 2020 will be met.

It should, however, also be borne in mind that spending cuts and behavioural changes linked to the current economic crisis may also impact on future trends.

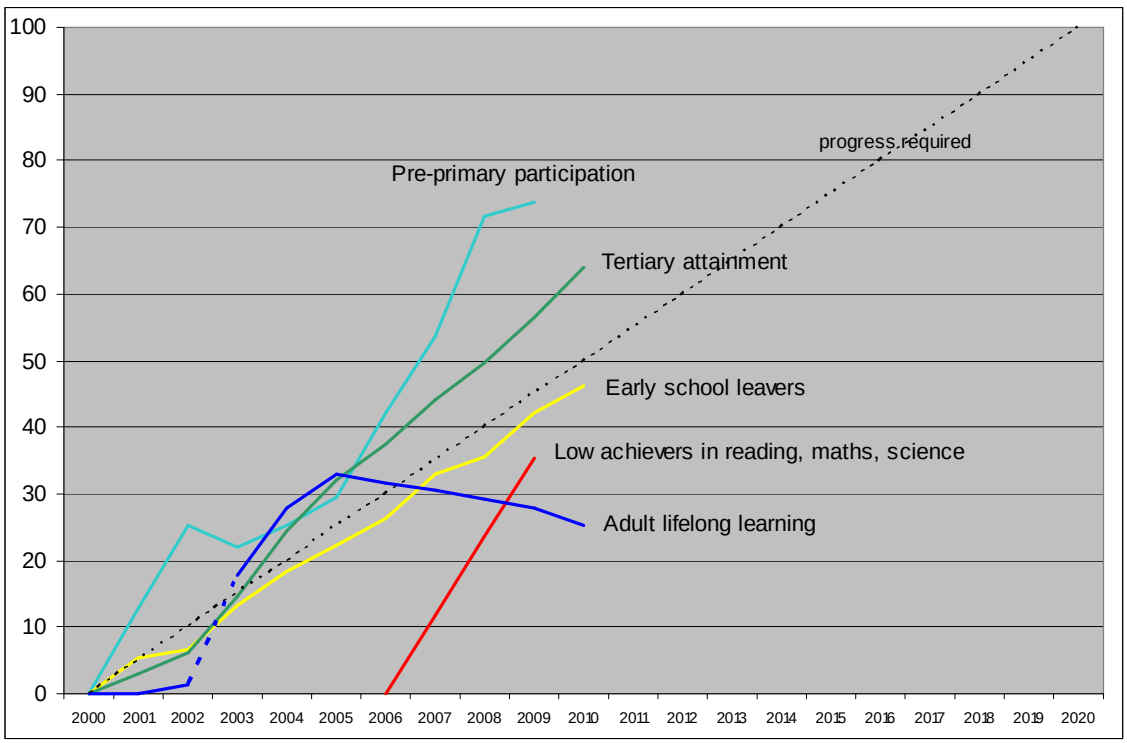
The existing benchmark on **low performance in reading** has, as outlined above at 2.1 above, been expanded for 2020, to cover also **low performance in mathematics and science**, with the rate of low achievement to be reduced by 2020 to no more than 15 %. In relation to reading, it is difficult to foresee a future trend at the EU level, given that there was a sharp discontinuity between the worsening of performance between 2000 and 2006 and the reasonably broad recovery evident in 2009 results. Looking at the broader measure to be used in the future, in 2009 Finland, Estonia and the Netherlands already had less than 15% low performers in reading and in maths. In science in addition Germany, Latvia, Hungary, Poland and Slovenia had less than 15% of low performers.

In relation to the benchmark on **early school leaving** which is retained for 2020 with no change in the rate, progress has been slow over the past decade. However, the new focus on this objective as a headline target of Europe 2020 can be expected to have an impact; a number of Member States have set ambitious national targets. First projections based on these and taking account of past trends would suggest that progress in the decade ahead will improve but may still not be sufficient to actually meet this key target.

The benchmark on **adult participation in lifelong learning** has been set to the higher level of 15% for 2020. Performance over the period as a whole has improved but the decline since 2005 described in section 2.1 implies that further efforts are needed if this benchmark is to be reached. [1]

The overall trend towards the 2020 benchmarks, derived solely by projecting from the trend in performance since 2000, is summarised in Figure 2.7 below.

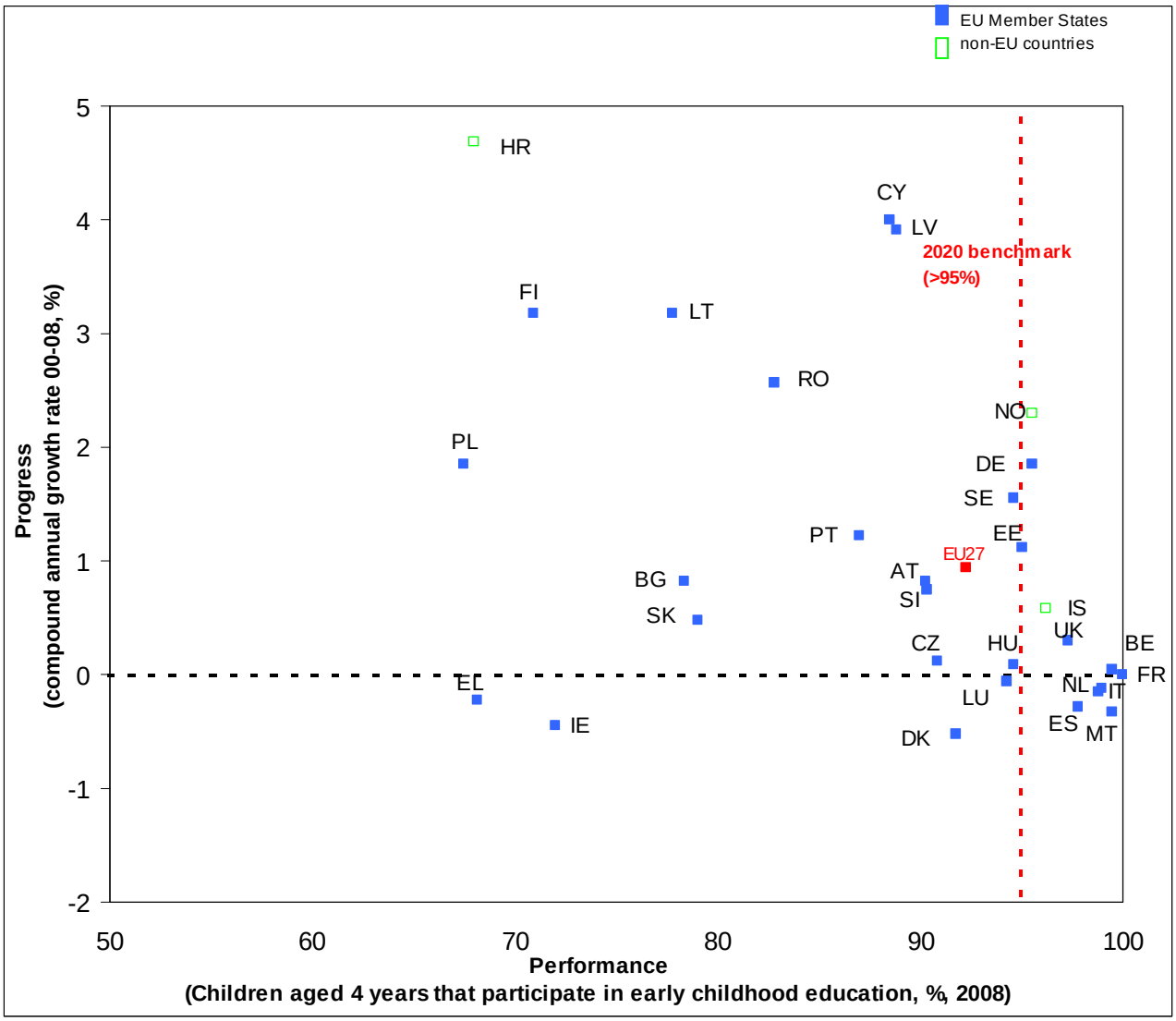
Figure Int.2.7
Trends towards the five benchmarks for 2020 (2000-2010)



Source: European Commission - DG EAC

[1] The trend is difficult to construct due to be low levels of comparability of data between 2003 and 2005.

Figure Int. 2.8
Benchmark 2020: Children in early childhood education (between four years and the start of compulsory education, 2000-2008)



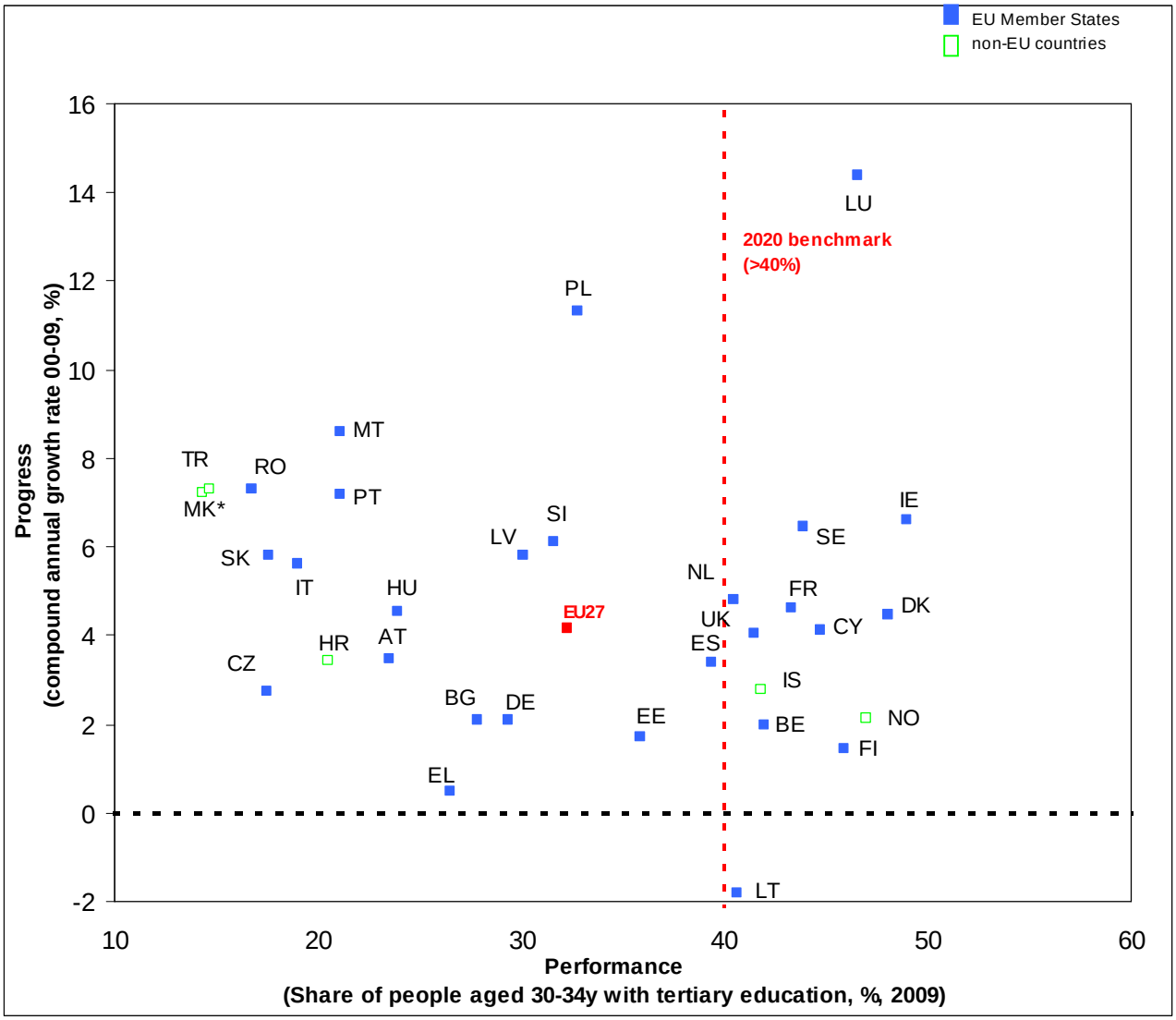
Source: European Commission, JRC/CRELL calculations based on UOE data

Notes:
m:missing
Croatia (2000-2002m), Greece (2000-2007), Ireland (2000-2007m, no time series available, so country is not displayed),
Turkey (performance: 26.7%, progress:12.65%, country is outside the scale and not displayed),
The former Yugoslav Republic of Macedonia (performance 26.1%, progress: 5.96% country is outside the scale and not displayed)

Countries in the upper right quadrant have performance above the level of the EU benchmark (high share of children participating inpre-school education) and have been successful in increasing this share further in the past, while countries in the lower left quadrant have below EU benchmark performance and have not been successful in increasing this share in the past.

The trend in relation to the new benchmark on **early childhood education** is set out in Figure 2.8. The Council has agreed that by 2020 at least 95% of children between 4 years old and the age for starting compulsory primary education should participate in early childhood education. Latest available figures, for 2008, show that already more than 92% of children participate and suggest that the benchmark level should be attainable by 2020. Participation has progressed since 2000 in most European countries. In several member states it is above the benchmark of 95% and even above 98% (Belgium, France, Spain, Netherlands, Italy). EU countries with low participation rates include Greece, Poland and Finland. The latter two have, however, shown good progress since 2000.

Figure Int 2.9
Benchmark 2020: Share of 30-34y with tertiary educational attainment (2000-2009)



Source: European Commission, JRC/CRELL calculations based on LFS data

Notes :
*MK: The former Yugoslav Republic of Macedonia; see Annex 2
Countries in the upper right quadrant have performance above the level of the EU benchmark (high share of30-34 year olds with tertiary attainment) and have been successful in increasing this share further in the past, while countries in the lower left quadrant have below EU benchmark performance and have not been successful in increasing this share in the past.

The new benchmark for **tertiary attainment levels among the young adult population** foresees that by 2020 at least 40% of 30-34 year olds should hold a university degree or equivalent. The trend since 2000, shown in Figure 2.9, would suggest this is attainable by 2020. Member States' targets, as set out in their first provisional National Reform Programmes, are by and large very cautious and would suggest a lower rate of progress, possibly leading to non-achievement of the target by 2020.

2.3. Best performing countries: Learning from good practice

The overall presentation of performance and progress above clearly shows that all countries have strengths and weaknesses in the five benchmark areas and that no country is "falling behind" in all areas.

Countries that show good performance in several areas for the 2010 benchmarks include Finland, which has performance levels above all 5 benchmarks, and Poland, which has performance levels above the EU benchmarks and is moving further ahead in four of the five areas.

Given that mutual learning is a core objective of the OMC, the Council asked for the three best performing countries (leaders) in specific policy areas to be identified. Figures Int.2.1 and Int.2.2 present the findings, drawing also on the wider set of core indicators established by the Council in 2007. Half of all Member States can be counted among the leading group of three in at least one benchmark area and adding in the core indicators, three more countries are among the leaders, in participation in early childhood education. Good education performance seems to be widely spread among EU Member States.

Figure Int. 2.10: Best performing countries on benchmarks relating to school education

	Target for 2010/2020	Best performing countries in the EU			EU	USA	Japan
Participation in early childhood education (4 years-start of comp. primary), %	2020: 95%	2009					
		France 100	Netherlands 99.5	Spain/Belgium 99.3	92.5	69.2 (2007)	96.4 (2007)
2010: Low-achievers in reading (15-year-olds, %)	2010: At least 20% Decrease	Change in the percentage of low achievers in reading % (2000-2009)					
		Latvia -41.5	Poland -35.3	Portugal -33.1	-6.1	-1.1	+34.7
2020: Low-achievers in reading, maths and science.	2020: no more than 15%	Share of low achievers in reading, maths and science, 2009, %					
		Finland 7.3	Estonia 11.4	Netherlands 13.6	19.8	19.7	12.3
Early school leavers (18-24) %)	2010/2020: No more than 10%	2010					
		Slovakia 4.7	Czech Rep. 4.9	Poland 5.4	14.1	-	-
Upper secondary attainment (20-24, %).	2010: At least 85%	2010					
		Slovakia 93.2	Czech Republic 91.9	Poland 91.1	79.0	-	-

Source: DG Education and Culture
Data sources: Eurostat (UOE data collection and LFS); OECD/Pisa

Figure Int.2.11: 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)	<u>2010:</u> Increase of at least 15% graduates	Average annual increase 2000-2009					
		Slovakia +14.1%	Romania +12.0%	Czech Rep. +10.4%	+3.9%	+2.0%	-1.4%
		MST Graduates per 1000 inhabitants (aged 20-29) in 2009					
		France 20.2	Romania 20.0	Finland 19.0	14.3	10.3	14.2
		% of female graduates in 2009					
		Luxembourg 48.2 *	Estonia 39.8	Bulgaria 37.4	32.3	30.9	14.1
Higher education attainment (age 30-34), %		Higher education attainment, 2010					
		Ireland 49.6	Denmark 47.0	Luxembourg 46.1 (p)	33.6	41** Aged 25-34	56** Aged 25-34
Adult Lifelong Learning participation (25-64, %)	<u>2010:</u> At least 12.5% <u>2020:</u> at least 15%	2010					
		Denmark 32.8	Sweden 24.5	Finland 23.0	9.1	-	-

Source: DG Education and Culture
Data source: Eurostat (UOE and LFS)
* 2008, ** 2009 - p: provisional

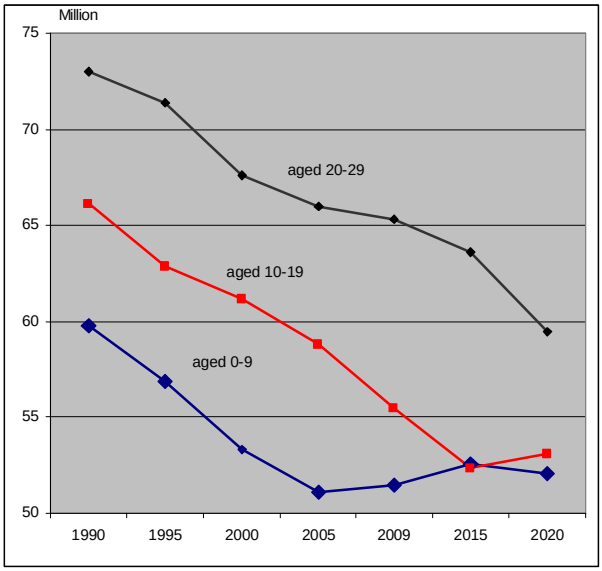
3. Demographic trends and Participation in Education

3.1. Current trends in the number of young people in the population

In 2009, young people under 30 years represent about 35% of the total population in the EU27. However, the number of young people in the European Union has declined steadily. Between 1990 and 2009, the population aged 0-9 years in the EU27 decreased by 13.9%, the population aged 10-19 by 16.0%, and the population aged 20-29 by 10.5% (Figure Int 3.1).

These trends have a different impact on the different levels of education. While compulsory education (primary and lower secondary education) are currently seeing a lower intake of pupils through smaller cohorts, increases in participation rates in upper secondary education and university are counteracting the demographic decline.

Figure Int. 3.1: Variation of the population in the 0-9, 10-19 and 20-29 age groups in the EU-27 (1990-2020)



	0-9 age group	10-19 age group	20-29 age group
1990	59.8	66.1	73.0
1995	56.9	62.9	71.4
2000	53.3	61.2	67.6
2005	51.1	58.8	66.0
2009	51.5	55.5	65.3
2015	52.6	52.4	63.6
2020	52.1	53.1	59.5

Source: Eurostat, population statistics (2015-2020 from the Europop 2008 forecast, convergence scenario)

Additional notes
France: The data does not include the overseas *départements*.
Cyprus: The data relates to territories under government control.

Explanatory note
a) National data are contained in the annexes available at http://www.eurydice.org.
The population is that of 1st January in the reference year. The population is based on data from the most recent census adjusted by the components of population change produced since the last census, or based on population registers.

This overall trend conceals contrasting situations. For the 0-10 age group, although for the EU-27 figures, as a whole, are slightly increasing since 2005, in Germany and many central and Eastern European member states the population in this age group has decreased each year. Trends are slightly better for the 0-4 years old (and hence the future intake of primary schools) since birth rates have slightly recovered in recent years in some of these countries. At the same time, Ireland and Spain have recorded significant growth rates, partly a result of strong net migration (see figure Int 3.2).

Figure Int. 3.2: Evolution of the population 0-9 years old by country

	Population 0-4 (000s)				Population 5-9 (000s)			
	2000	2005	2010	Change 2000-2010	2000	2005	2010	Change 2000-2010
EU-27	25451	25241	25782	**1.3**	27827.0	25816.0	25595.2	**-8.0**
Belgium	577.2	574.9	628.7	**8.9**	621.1	589.1	596.5	**-4.0**
Bulgaria	340.2	33.4	370.1	**8.8**	434.3	320.7	336.7	**-22.5**
Czech Republic	455.1	465.6	564.5	**24.0**	603.7	453.9	471.0	**-22.0**
Denmark	340.6	328.1	326.1	**-4.3**	341.8	344.1	329.9	**-3.5**
Germany	3947.6	3656.3	3409.6	**-13.6**	4251.6	3975.0	3647.7	**-14.2**
Estonia	6.1	65.2	76.4	**24.4**	81.7	61.3	65.1	**-20.3**
Ireland	264.6	295.8	350.8	**32.6**	267.7	279.6	310.7	**16.1**
Greece	518.1	517.9	569.2	**9.9**	564.9	519.2	525.8	**-6.9**
Spain	1840.2	2171.5	2461.2	**33.7**	1954.6	1978.7	2297.9	**17.6**
France	3752.4	3929.8	4037.8	**7.6**	3801.6	3865.1	3995.6	**5.1**
Italy	2624.6	2733.4	2844.7	**8.4**	2745.4	2686.3	2834.3	**3.2**
Cyprus	47.4	41.1	44.9	**-5.3**	54.8	47.6	42.3	**-22.8**
Latvia	95.9	100.6	114.2	**19.1**	145.3	95.8	100.0	**-31.2**
Lithuania	188.1	154.7	164.2	**-12.7**	245.6	185.8	152.3	**-38.0**
Luxembourg	28.5	27.9	28.7	**0.7**	28.4	29.2	29.8	**4.9**
Hungary	501.7	477.8	489.5	**-2.4**	596.9	503.1	482.2	**-19.2**
Malta	23.3	20.1	20.4	**-12.4**	26.5	23.8	20.2	**-23.8**
Netherlands	983.5	1010.6	924.9	**-6.0**	1001.7	987.9	1003.2	**0.1**
Austria	424.5	397.7	392.9	**-7.4**	478.1	436.6	406.8	**-14.9**
Poland	2029.3	1794.5	1952.8	**-3.8**	2535.7	2045.5	1790.0	**-29.4**
Portugal	535.9	553.7	519.8	**-3.0**	539.6	537.3	554.6	**2.8**
Romania	1144.7	1062.4	1086.2	**-5.1**	1268.5	1107.8	1060.2	**-16.4**
Slovenia	92.0	89.5	102.4	**11.3**	103.6	92.8	91.0	**-12.2**
Slovakia	291.6	260.0	280.2	**-3.9**	366.4	290.9	260.1	**-29.0**
Finland	297.5	283.7	298.1	**0.2**	329.4	299.4	287.8	**-12.6**
Sweden	468.7	485.6	548.2	**17.0**	608.0	479.9	503.9	**-17.1**
United Kingdom	3576.0	3408.9	3739.0	**4.6**	3830.0	3579.5	3399.4	**-11.2**
Croatia	:	205.7	214.2	**4.1**	:	248.4	208.5	**-16.1**
Iceland	21.3	21.0	23.2	**8.9**	22.8	21.4	21.4	**-6.1**
MK*	139.4	119.2	112.9	**-19.0**	152.8	132.0	118.9	**-22.2**
Turkey	7127.6	6684.6	6155.3	**-13.6**	6721.3	7111.1	6201.6	**-7.7**
Liechtenstein	2.0	1.9	1.9	**-5.0**	2.0	2.1	1.9	**-5.0**
Norway		302.4	289.1	**0.5**	308.8	306.9	298.5	**-8.0**

Data source: Eurostat; estimate for 2010 figure for the UK and EU 27 (based on 2009 UK result)
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

In the 10-19 age group, several countries (Bulgaria, Estonia, Latvia and Romania) had a population decrease over three times higher than the average rate for the EU-27. Around 1990 Central and Eastern European countries experienced a strong decline in the number of births. Since 2005 birth rates have stabilized or are increasing again. The strong decline in cohort size in these countries from 1990 is now starting to affect tertiary education.

3.2. Future pupil intake in primary and lower secondary education

Against the background of the falling youth population outlined above, the period 2000-2010 saw an overall fall in intake to primary education (of 8.5%) and to lower secondary school (of 12.9%). Population projections on future pupil intakes suggest that there will be a reversal of this decline and that EU-wide intakes to both levels will increase by around 3%.

However, as shown above, this overall increase is made up of contrasting trends among Member States.
During the period 2010-2020, Estonia, Ireland, Spain and Cyprus will experience a more than 15% growth in the projected intake. By contrast, Denmark, Germany, Italy, the Netherlands and Romania are projected to experience a fall. In Lower secondary education, Bulgaria, the Czech Republic, Estonia, Ireland, Spain, Latvia and Sweden will face projected increases of more than 10%. Germany, Lithuania, and Malta are likely to experience a more than 10% decrease.

3.3. The impact of migration

While the number of school age population is tending to decline, the share of pupils with a migration background is at the same time increasing. In 2009 2.7 million of the 51.5 million children (5.2%) aged 0-9 had a foreign citizenship. About two thirds of foreigners living in the EU have a citizenship of a non-EU country.
However, the share of students with an immigration background tends to be higher since many acquire the nationality of the host country at birth. The OECD PISA study shows for 21 EU countries with data for 2000 and 2009 an average share of 15 year old students with immigrant background of about 10% in 2009, up from 7% in 2000. While the share of immigrant pupils increased only moderately in countries, which had already high shares in 2000, the share doubled in Finland, Greece and the Czech Republic, it more than tripled in Ireland and grew by a factor of five in Italy and Spain (from relatively low levels in 2000). The increasing share of migrant pupils is a challenge for education since the language spoken at home in migrant families often differs from the language of instruction.

3.4. Overall population trends

European populations are aging because of two major trends. First, total fertility rates have remained low for several decades i.e. below the rate of replacement which is at an average of 2.1 children per women. Second, people live longer and healthier lives.

Projections of demographic developments of specific age-groups towards 2060 (Figure Int.3.3) shows that the population of the EU27 will rise gradually from 495.4 million in 2008, reaching 519.9 million in 2030 and gradually declining to reach 505.7 in 2060. The population is becoming older with the median age projected to rise from 40.4 years in 2008 to 47.9 years by 2060.

While the youngest age cohort (0-14 years) is projected to decrease slightly from 77.5 million (16% of the total population) to 71 million (14 % of the total population), the major changes will take place in the age group 15-64 year olds and the population older than 65. The working age population (15-64 year olds) falls by about 50 millions while the population older than 65 increases by more than 60 million. In terms of share of the total population, the working age population is expected to fall to 56% of the total population, while the share of people older than 65 are expected to increase to 30% of the total population. Consequently, the old age dependency ratio is expected to increase substantially from its current levels of 25.9% to 53.5% in 2060. In 2008 there are 4 persons of working age (15-64 years old) for every person aged 65 years or over. In 2060 the ratio is expected to be 2 to 1.

These overall population trends also hold policy messages for education. The shrinking labour force (i.e. the population age 15-64) suggests that lifelong learning, at all levels and in formal, non-formal and informal structures becomes even more important in the future to ensure that people on the labour market have right levels of skills (chapter II on labour market outcomes analyse this relationship in more detail). The fast growing share of people over 65 year olds underlines the need for emphasising educational opportunities also for this group. Moreover, it suggests an increased demand for care and a need for educating more people to work in the care sector.

Figure Int. 3.3: EU population in millions

	2008	2030	2060
Total population (1 January)	495.4	519.9	505.7
Population aged 0-14 Share of total population	77.5 16%	75.5 14%	71.0 14%
Population aged 15-64 Share of total population	333.2 67%	321.9 62%	283.3 56%
Population aged 65+ Share of total population	84.6 17%	122.5 24%	151.5 30%
Old age dependency ratios	**25.9%**	**38.1%**	**53.5%**

Source: EUROSTAT population statistics

4. Investment in Education

Investment in education and training is essential for the achievement of Europe's objective of high levels of sustainable, knowledge-based growth and jobs. It represents one of the main priorities in the new EU strategy for smart, sustainable and inclusive growth – 'Europe 2020', which calls for ensuring adequate investment in education and training systems at all levels.[2]

This section analyses the patterns of investment in education in EU and the participating partner countries.[3] The overall level of educational investment and the spending per student at different levels are discussed in the first part of this section. The second part provides some insights into the variety of national patterns of investment in education.

4.1. The overall level of investment in education

In 2007 over 85% of the spending on educational institutions (for all levels combined) at the European level as reflected by the expenditure of those institutions, was covered by public sources, whereas private investment represented only around 15%.

It must be borne in mind that the most recent data relate to 2007. The impact of the recession and the almost universal focus on cutting public spending is likely to have had a major impact on investment in education but this is not yet caught in the table.

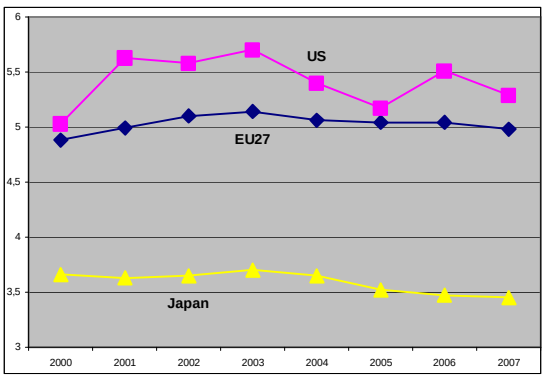
Public spending

In 2007 public spending on education in the EU accounted for 4.98% of the GDP. There are large variations between European countries: Denmark has the highest relative spending among the EU Member States (7.83% of GDP), followed by Cyprus (6.93%), Sweden (6.69%) and Belgium (6.02%). High levels of public spending on education are recorded as well in Iceland (7.36%) and Norway (6.76%). Public investment in education is below 4% of GDP only in Slovakia.

Between 2000 and 2007 public spending on education as a proportion of GDP did not change much in the EU as a whole. Countries with an increase of more than half a percentage point include Ireland, Cyprus and Romania while Estonia, Lithuania, Latvia and Sweden were countries with a decline of more than half a percentage point. The Baltic States in this period had rapid economic growth, the decline in the share of GDP hence still meant that spending in real terms increased;

Public spending on education as a percentage of GDP is higher in the EU than in Japan (3.5%) but lower than in the US (5.3%) as can be seen in Figure Int. 4.1; both the US and Japan also have higher levels of private spending on education than the EU.

Figure Int. 4.1: Public spending on education as a percentage of GDP (2000-2007)



Data source: Eurostat, Structural Indicators (June 2010)

[2] '*A strategy for smart, sustainable and inclusive growth*', Communication from the Commission, COM(2010) 2020, Brussels, pp.11

[3] Data presented and analysed here only covers the formal educational systems as defined in the joint Unesco-OECD-Eurostat (UOE) data collection. Although some information about other types of public investment on training (e.g. for the unemployed) do exist, it will not be discussed here."

Figure Int. 4.2: Public expenditure on education as a percentage of GDP in European countries

	2000	2006	2007
EU-27	**4.88**	**5.04**	**4.96**
Belgium	:	6.00	6.02
Bulgaria	3.97	4.24	4.13
Czech Republic	3.97	4.61	4.20
Denmark	8.29	7.98	7.83
Germany	4.46	4.40	4.50
Estonia	6.10	4.80	4.85
Ireland	4.28	4.74	4.90
Greece	3.39	4.04 05	:
Spain	4.28	4.28	4.35
France	6.03	5.58	5.59
Italy	4.55	4.73	4.29
Cyprus	5.35	7.02	6.93
Latvia	5.64	5.07	5.00
Lithuania	5.90	4.84	4.67
Luxembourg	:	3.41 (1)	3.15 (1)
Hungary	4.42	5.41	5.20
Malta	4.49	6.79 05	:
Netherlands	4.96	5.46	5.32
Austria	5.74	5.44	5.40
Poland	4.89	5.25	4.91
Portugal	5.42	5.25	5.30
Romania	2.86	:	4.25
Slovenia	:	5.72	5.19
Slovakia	3.93	3.79	3.62
Finland	5.89	6.14	5.91
Sweden	7.21	6.85	6.69
United Kingdom	4.46	5.48	5.39
Croatia	:	4.11	4.07
Iceland	5.81	7.55	7.36
MK*	:	:	:
Turkey	2.59	2.86	:
Liechtenstein	:	2.06	1.92
Norway	6.74	6.55	6.76
United States	5.03	5.42	5.29
Japan	3.66	3.47	3.45

Data source: Eurostat (UOE)
(i) See: Eurostat database, (:) Missing or not available, *MK: The former Yugoslav Republic of Macedonia; see Annex 2
(1) tertiary education level not included

Private spending

For 14 European countries, private spending represented less than 10% of total spending on educational institutions. Two Nordic countries (Finland and Sweden) had even less than 3%. For another group (Czech Republic, Spain, Latvia, Romania, Slovenia and Slovakia), private sources accounted for 10 to 15% of total spending on educational institutions. In Cyprus, Netherlands, Germany and Bulgaria, educational institutions were funded from private sources in a proportion of 15 to 30%. These EU rates compare with 33% in Japan, 34% in the United States and 40% in Korea. Among EU Member States only the United Kingdom (31%) comes close to such levels of private sources of funding.

In one-third of the European countries, the level of private spending on education as a percentage of GDP went up between 2000 and 2007, whereas the remaining countries showed a decreasing or a constant level.

Figure Int. 4.3: Private spending on education as a percentage of GDP (2000-2007)
Expenditure on educational institutions (all levels of education) from private sources as % of GDP and average annual change

	2000	2006	2007
EU-27	**0.63 i**	**0.67 i**	**0.73 i**
Belgium	0.42 i	0.34 i	0.34
Bulgaria	0.65	0.65	0.62
Czech Republic	0.42	0.56	0.51
Denmark	0.27 i	0.59	0.53
Germany	0.97	0.7	0.69
Estonia	:	0.34	0.32 i
Ireland	0.30	0.28	0.24 i
Greece	0.22 i	:	:
Spain	0.60	0.52	0.61 i
France	0.56	0.54	0.53
Italy	0.44	0.38	0.40
Cyprus	2.59	1.21	1.27
Latvia	0.63 i	0.66	0.56
Lithuania	:	0.46	0.45
Luxembourg	:	:	:
Hungary	0.57	0.54	:
Malta	0.48 i	:	:
Netherlands	0.82	0.88	0.90
Austria	0.33	0.59	0.48
Poland	:	0.54 i	0.50 i
Portugal	0.08 i	0.44 i	0.46 i
Romania	0.25 i	:	0.50
Slovenia	:	0.78	0.73
Slovakia	0.15 i	0.62 i	0.53 i
Finland	0.11	0.15	0.14
Sweden	0.19	0.17	0.16
United Kingdom	0.76 i	1.44 i	1.75 i
Croatia	:	0.38	0.35
Iceland	0.54 i	0.81 i	0.77 i
MK*	:	:	:
Turkey	0.04 i	:	:
Liechtenstein	:	:	:
Norway	0.08 i	:	:

Data source: Eurostat (UOE)
(i) See: Eurostat database, (:) Missing or not available,
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

4.2. Education spending by level of education

At the EU level, public spending on primary education amounted to 1.1% of GDP in 2007 whereas spending on the secondary level accounted for the biggest share of public education spending - some 2.2% of GDP. About 1.1% of the GDP went to tertiary level of education. The remaining part of the investment (about 0.5% of the GDP) was spent on pre-primary education or went to spending which cannot be allocated to a specific level. The spending at primary level of education as percentage of GDP ranged from between 0.6% (in Czech Republic) and 2.5% (in Iceland) of GDP. As regards the secondary education, spending ranged from less than 1% of GDP in Croatia to over 2.5% in several countries (Belgium, Denmark, France, Cyprus, Austria, Finland, and Sweden). Four European countries (Luxembourg, Slovenia, Croatia, Iceland) show higher levels of investment as proportion of GDP in primary compared to secondary education. For a more detailed analysis of spending on higher education see section 3 of chapter II.

Figure Int. 4.4: Public spending by level of education as a percentage of GDP (2007)
Total public expenditure on education as a percentage of GDP by levels of education and average annual change

	Primary	Secondary	Tertiary	All levels
EU-27	**1.16**	**2.21**	**1.12**	**4.98**
Belgium	1.42	2.58	1.31	6.02
Bulgaria	0.82	1.84	0.68	4.13
Czech Republic	0.58	2.03	1.07	4.20
Denmark	1.86	2.80	2.29	7.83
Germany	0.63	2.25	1.14	4.50
Estonia	1.13	2.25	1.07	4.85
Ireland	1.72	2.03	1.14	4.90
Greece	:	:	:	:
Spain	1.10	1.66	0.99	4.35
France	1.17	2.55	1.23	5.59
Italy	1.08	1.98	0.76	4.29
Cyprus	1.95	3.03	1.61	6.93
Latvia	1.24	2.11	0.93	5.00
Lithuania	0.67	2.41	1.01	4.67
Luxembourg	1.69	1.46	:	3.15
Hungary	0.99	2.29	1.03	5.20
Malta	:	:	0.95	:
Netherlands	1.32	2.16	1.45	5.32
Austria	0.97	2.52	1.50	5.40
Poland	1.59	1.89	0.93	4.91
Portugal	1.48	2.09	1.20	5.30
Romania	0.84	1.52	1.12	4.25
Slovenia	2.26	1.16	1.21	5.19
Slovakia	0.67	1.69	0.79	3.62
Finland	1.20	2.52	1.85	5.91
Sweden	1.68	2.64	1.77	6.69
United Kingdom	1.65	2.45	0.94	5.39
Croatia	1.83	0.87	0.81	4.07
Iceland	2.52	2.40	1.39	7.36
MK*	:	:	:	:
Turkey	:	:	:	:
Liechtenstein	:	:	0.17	:
Norway	1.69	2.36	2.16	6.76

Data source: Eurostat (UOE)
(i) See: Eurostat database, (:) Missing or not available
*MK: The former Yugoslav Republic of Macedonia; see Annex 2
(**) Investments on pre-primary level and those not allocated by level are not included in this table

4.3. Education spending per student

Expenditure per student follows a common pattern throughout European countries: it goes up substantially with the level of education. In 2007, the EU Member States spent between 1900 (Bulgaria) and 11600 (Luxembourg) Purchasing Power Standards (PPS) Euro per primary student, respectively between 1800 (Bulgaria and Romania) and 15200 (Luxembourg) PPS Euro per secondary student (figure Ann. Int. 4.5). At the EU level, the average ratio of tertiary-to-primary expenditure per full-time equivalent student in public institutions was 1.8 in 2007 (with a ratio of 2.5 or over in the Czech Republic, Germany, Cyprus and Romania). [4]

[4] Differences in student-teaching staff ratios, staffing patterns, teachers' salaries, teaching materials and facilities largely account for the cost differences between levels of education.

Figure Int. 4.5: Spending per student by level of education
Annual expenditure on public educational institutions per pupil/student in EUR PPS, based on full-time equivalents

2007	1000 Euro PPS			All levels
	Primary	Secondary	Tertiary	
EU-27	**5.2**	**5.9**	**9.2**	**6.1**
Belgium	6.9	8.3	12.1	8.0
Bulgaria	1.9	1.8	3.8	2.2
Czech Republic	3.8	4.6	7.4	4.6
Denmark	8.0	8.2	13.7	8.5
Germany	4.6	5.2	11.9	6.2
Estonia	3.4	4.2	5.3	3.6
Ireland	5.7	7.4	11.0	7.2
Greece	:	:	:	:
Spain	6.2	8.5	10.7	7.8
France	5.3	8.5	11.0	7.2
Italy	6.1	6.7	7.2	6.6
Cyprus	6.8	10.0	17.4	8.7
Latvia	3.4	3.5	3.5	3.4
Lithuania	2.4	2.9	4.7	3.2
Luxembourg	11.6	15.3		38.9
Hungary	3.8	3.5	5.6	4.1
Malta	:	:	:	:
Netherlands	5.4	7.7	13.1	7.4
Austria	:	:	:	:
Poland	3.4	3.0	4.6	3.5
Portugal	4.2	5.7	8.6	5.3
Romania	2.2	1.8	5.4	2.6
Slovenia	6.5	4.9	6.0	6.1
Slovakia	2.9	2.7	4.8	3.1
Finland	5.2	6.6	11.6	6.7
Sweden	6.9	7.4	15.5	7.9
United Kingdom	6.1	6.9	:	6.5
Croatia	3.2	3.2	6.4	3.8
Iceland	8.1	7.1	8.6	8.3
MK*	:	:	:	:
Turkey	:	:	:	:
Liechtenstein	7.8	8.3	:	7.7
Norway	8.4	9.8	15.3	9.9

Data source: Eurostat (UOE)
(i) See: Eurostat database, (:) Missing or not available
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

CHAPTER I

Making lifelong learning and mobility a reality

1. Participation in Lifelong learning

This chapter reflects the wider policy concern with the full range of learning from "cradle to grave" - and not just adult education - and therefore presents information about participation in the different phases of the education continuum. Other European benchmarks, such as participation in pre-school education, early leavers from education after compulsory schooling, as well as higher education graduation, all support the aim of making lifelong learning throughout the life cycle a reality.

For a more detailed presentation of participation issues in individual education sectors see chapters II and III.

1.1. Participation in lifelong learning at various lifetime stages

Participation in pre-primary education

In a number of EU countries, nearly all children (over 98%) between 4 years-old and the starting age for compulsory schooling are enrolled in early childhood education - this is so for France, Belgium, Spain, Italy and the Netherlands. Malta, the UK, Germany and Estonia are close behind; they all exceed the benchmark target of 95% enrolment by 2020. Germany, Cyprus, Latvia, Lithuania, Romania, Finland and Sweden have all achieved strong increases in enrolments since 2000 of over 10 percentage points *(see also Chapter III*), while the EU average has increased from 85.6% in 2000 to 92.3% in 2008.

Participation in school and higher education

In most EU countries the starting age for compulsory school education is six years (in addition there is compulsory-pre-primary education in some countries starting at an earlier age). The number of countries with a starting school age of 7 has declined in recent years. Countries that have lowered the starting age from 7 to 6 include Denmark (from August 2008), Romania (from 2003/04) and Poland (in the period 2009/2012).

Figure I.1.1: Starting ages for compulsory education

Age	Country /education system	
	Compulsory school starting age	Compulsory pre-primary
4	UK-Northern Ireland	Luxembourg
5	UK-England, UK-Scotland, UK-Wales, Malta, Netherlands,	Greece (children who have reached the age of 5 by 31 Dec of the year in which they enrol), Hungary, Poland (from September 2011)
6	Austria, Belgium, Cyprus(children 5 years and 8 months old before 1 September), Czech Republic, Denmark, France, Germany, Greece, Hungary, Iceland, Republic of Ireland, Italy, Liechtenstein, Luxembourg, Norway, Poland (from September 2012), Portugal, Romania, Slovakia, Slovenia, Spain, Turkey	Latvia (5-6 year olds), Poland
7	Bulgaria, Estonia, Finland, Latvia, Lithuania, Poland, Sweden	

Source: Eurydice

While children start their education earlier in some countries the final age for compulsory education has also increased in recent years. An example is Portugal where compulsory schooling has been extended from 9 to 12 years, implying a school leaving age of 18. On the other hand, there are countries that reduce the length of upper secondary education. Several Länder in Germany are in the process of reducing the duration of upper secondary from 4 to 3 years (reduction of total years of schooling until graduating from upper secondary from 13to 12 years).

Figure I.1.2: Final age for compulsory education

Age	Country /education system	
	Full time education	Part time education
15	Austria, Belgium, Czech Republic, Cyprus, Greece, Slovenia	
16	Bulgaria, Denmark, Estonia, Finland, France, Germany, Ireland, Latvia, Lithuania, Luxembourg, Romania, Spain, Slovakia, Sweden, UK Iceland, Norway	
18	Hungary, Netherlands, Portugal	Belgium, Poland, Germany (18-19)

Source: Eurydice

The growth in participation rates in non-compulsory education and, in addition, for some countries the increasing length of compulsory initial education, results in young people staying on average more years in education in many EU countries. Across EU member states the number of years that pupils and students can expect to stay in education from pre-school to higher education, went up by 0.6 years since 2000; in Greece, Cyprus, Latvia, Lithuania and Romania the increase was 2 years or more, as can be seen in figure I.1.3

Figure I.1.3: Expected years in education and training in European countries (d)

	Students in all ISCED levels		
	2000	2007	2008
EU-27	**16.7**	**17.2**	**17.3**
Belgium	18.6	19.6	19.6
Bulgaria	14.2	15.7	15.7
Czech Republic	15.6	17.3	17.5
Denmark	17.8	19.0	18.8
Germany	17.2 i	17.6 i	17.6 i
Estonia	16.8	18.0	17.9
Ireland	16.3	17.4	17.3
Greece	15.0	17.4	18.0
Spain	17.0	17.2	17.1
France	16.6	16.6	16.4
Italy	16.1	17.0	17.0
Cyprus	13.0 i	14.8	15.3
Latvia	15.5	17.6	17.6
Lithuania	15.8	17.9	17.9
Luxembourg	14.3 i	13.9 i	14.5
Hungary	16.1	17.8	17.7
Malta	14.4 i	14.7 i	13.5
Netherlands	17.2	17.7	17.8
Austria	15.5	16.5	16.6
Poland	16.4	17.9	17.9
Portugal	16.9	17.0	18.4
Romania	14 i	15.9	16.4
Slovenia	16.7 i	18.0	18.5
Slovakia	:	16.4	16.5
Finland	18.6	20.5	20.5
Sweden	19.9	19.7	19.5
United Kingdom	18.9	16.2	16.5
Croatia	:	15.2	15.3
Iceland	17.9	19.8	19.9
MK*	12.9 i	13.7	13.7
Turkey	:	12.8	13.6
Liechtenstein	13.5	16.3	16.3
Norway	17.8	18.4	18.3

Data source: Eurostat (UOE data collection)
(:) Missing or not available, (i) See: Eurostat database
(d) Number of years a person of a given age can expect to spend within the specified ISCED levels, including years spent on repetition. This type of estimate will be accurate if current patterns of enrolment continue in the future. Estimates are based on headcount data.
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

More and more young people are staying later in education. In 2008 nearly 60% of the age group 15-24 participated in formal education, 5 percentage points more than in 2000. The countries with the highest participation rates (> 70%) were Poland and Slovenia. Countries with low rates (< 50%) include Cyprus, Luxembourg and the UK. For Cyprus and Luxembourg the low rate is partially explained by the fact that many tertiary students study abroad (and hence are not included in the calculation), for the UK by the fact that many tertiary students finish their studies relatively early.

In the age group 16-18 over 86% of young people in Europe are still in formal education. In the Czech Republic, in Lithuania, Poland and Sweden over 95% of young people in this age group are still enrolled. Cyprus, Luxembourg, Romania and the UK are the countries with the lowest enrolment rates (< 80%).

After the age of 18 enrolment rates strongly decline, since upper secondary education ends for many pupils. At the age of 20 just more than half of young people in the EU are still enrolled. In Greece, Poland and Slovenia more than two thirds of young people in this age group are still enrolled.

At the age of 22, students have generally finished upper secondary education and in some countries they have already finished tertiary education. Enrolment rates in the EU hence fall to 36% for this age cohort. In Poland, Slovenia and Finland, however, at this age still more than 50% of the cohortare enrolled, while in Cyprus, Luxembourg and the UK less than ¼ are enrolled.

Figure I.1.4: Students (ISCED 1-6) by sex aged 15-24 years as % of corresponding age population

	Students enrolled as a% of corresponding age population at the age of..						
	15-24 years			16-18 years	20 years	22 years	24 years
	2000	2007	2008	2008	2008	2008	2008
EU-27	54.8	59.5	59.7	86.4	51.4	36.3	23.6
Belgium	65.3	68.6	68.2	94.4	66.0	42.7	24.6
Bulgaria	42.5	52.4	51.9	81.0	40.4	34.1	18.2
Czech Republic	47.9	62.1	61.6	95.1	48.8	35.3	23.4
Denmark	58.4	66.9	66.5	85.8	47.3	49.7	44.2
Germany	62.8 (i)	65.4	64.7 (i)	92.1	55.5	39.8	28.9 (i)
Estonia	60.7	62.1	60.8	91.4	51.8	38.6	21.7
Ireland	54.3	58.1	57.9	93.2	57.9	28.4	12.6
Greece	53.6	60.1	64.2	83.0	68.5	45.5	27.9
Spain	56.2	55.4	55.4	81.9	49.9	34.7	22.4
France	61.7	58.8	58.3	86.7	50.0	31.6	16.4
Italy	46.9 (i)	56.3	57.5 (i)	85.6	43.4	33.5	24.8 (i)
Cyprus	37.0	41.2	43.6	74.2	31.9	19.5	12.0
Latvia	55.4	62.5	61.0	89.5	52.6	45.2	19.9
Lithuania	60.1	68.7	69.0	95.1	65.8	49.4	26.4
Luxembourg	40.8 (i)	41.8	46.3	79.1	33.5	14.5	7.1
Hungary	50.1	63.7	64.5	91.3	62.7	39.9	22.7
Malta	37.1	44.5	: (u)	:	: (u)	: (u)	: (u)
Netherlands	62.7	67.5	68.1	91.5	65.0	45.5	27.9
Austria	50.9	53.8	54.5	84.4	36.6	31.2	24.6
Poland	61.6 (i)	70.3	70.3 (i)	95.0	69.3	52.6	30.5 (i)
Portugal	51.1	53.0	56.2	82.6	47.5	34.3	22.1
Romania	37.3 (i)	53.6	56.9	78.7	44.0	33.3	23.9
Slovenia	59.3 (i)	70.1	71.0	94.6	84.5	50.6	35.9
Slovakia	:	56.3	56.5	89.0	43.5	33.7	16.9
Finland	67.5	70.9	70.5	94.4	50.0	57.9	49.1
Sweden	64.5	66.6	65.0	97.9	36.3	43.8	39.2
United Kingdom	54.2 (i)	47.7	47.9	72.9	40.6	20.9	13.4
Croatia	:	50.8	51.5	82.2	43.1	29.6	12.0
Iceland	60.8	66.6	65.4	84.5	50.2	32.0	39.6
MK*	35.4 (i)	42.2	43.9	69.1	32.3	24.6	11.7
Turkey	18.3	:	33.1	45.1	27.9	21.2	11.6
Liechtenstein	8.4	54.4	55.0	90.2	33.5	46.9	22.7
Norway	62.5	66.1	65.3	91.7	50.1	27.5	30.8

Data source: Eurostat (UOE data collection)
(:) Missing or not available, (i) See: Eurostat database
(d) Number of years a person of a given age can expect to spend within the specified ISCED levels, including years spent on repetition. This type of estimate will be accurate if current patterns of enrolment continue in the future. Estimates are based on headcount data.
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

The age of 24 is for many students the year they finish tertiary education. At this age in the EU 23.6% of a cohort is still enrolled. In Denmark and Finland, where a large share of young people participate in tertiary education and where the starting age is relatively high still more than 40% of young people are in education.

Participation in lifelong learning of adults

The European benchmark on lifelong learning concerns what could more strictly be called adult education and training. Originally established in 2003, it now sets the objective that by 2020 15% of adults aged 25-64 should participate in adult learning. Participation rates for this benchmark are measured by the European Labour Force Survey, which asks about participation in formal and non-formal learning in the 4 weeks prior to the survey[5]. Workplaces are in most countries the main providers of adult lifelong learning. Adult lifelong learning is one of the four components of the flexicurity approach of the European Employment Strategy.

Results for 2009 show that 9.3% of 25-64 year olds participated in education and training in the four weeks preceding the survey.[6] This is still short of the benchmark of 12.5% for 2010 and far below the 15% foreseen for

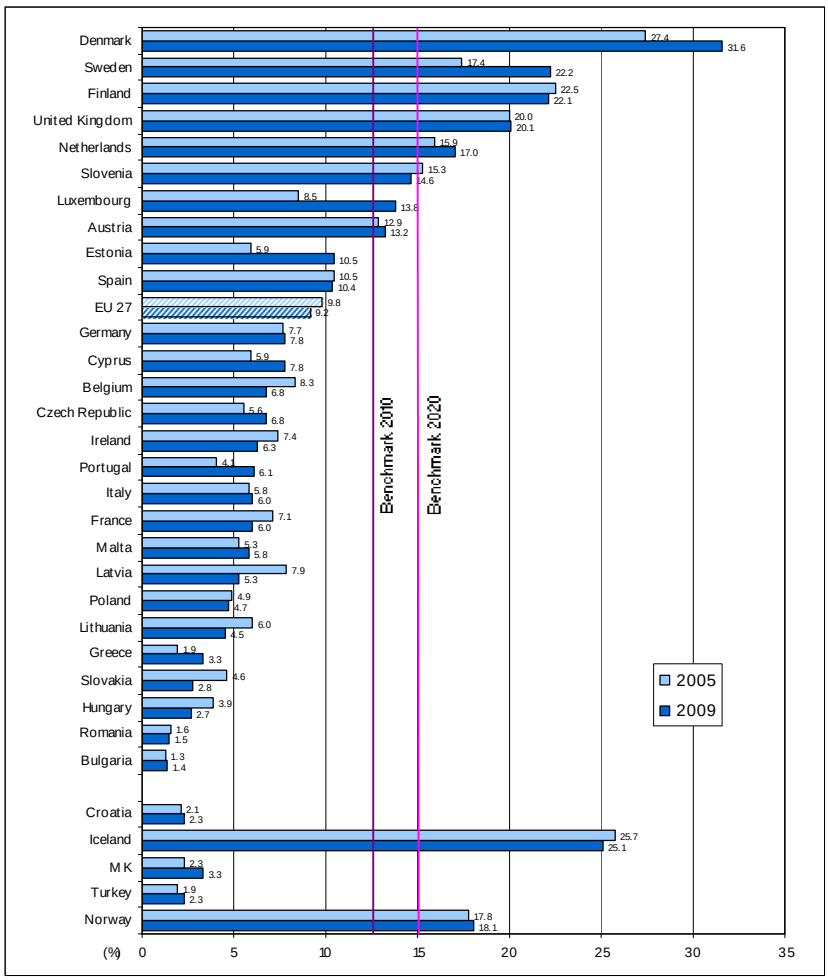
[5] The 5-yearly Adult Education Survey asks about participation in learning within the last year and hence shows higher participation figures. AES survey results are used in chapter III of this report.

[6] 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.

2020. In 2009 only 8 Member States exceeded the 2010 benchmark and only 5 the 2020 benchmark.[7] There has been furthermore a trend of decline in participation since 2005. There are large differences in participation between Member States; the Nordic countries and the UK, the best performers, achieve systematically high participation rates, reaching 20-30%. The Netherlands, Slovenia, Austria, Luxembourg Spain and Estonia are in the next group, with participation rates between 10% and 20%. Bulgaria, Greece and Romania, as well as Croatia and Turkey, have recorded little or no progress in improving their extremely low levels of participation.[8]
Estonia and Luxembourg, on the other hand, were successful in increasing participation rates substantially.

There are different patterns of adult participation in lifelong learning by age-group. Participation among adults aged 50-to-64 is considerably lower than that of younger age groups. Four member states: Denmark, Finland, United Kingdom, and Netherlands along with Iceland and Norway - which are the best performers in Europe for adult participation in lifelong learning overall - are also the best performers for this group but, nevertheless, with a substantially lower rate of participation than for the working age population as a whole. Denmark has one in four adults aged 50-to-64 taking part in lifelong learning, followed by Iceland, Finland, the United Kingdom and Norway, each with participation rates over 10%. In Greece, Hungary or Turkey less than 1% of that age-group had participated in lifelong learning in the four weeks preceding the survey.

Figure I.1.5: Participation of adults in lifelong learning in European countries
Percentage of the adult population aged 25 to 64 participating in education and training (2009)



Data source: Eurostat (LFS database), May 2010
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. For countries where data exists, the participation figures based on the Adult Education Survey (AES) results are in general higher than the LFS results due to differences in the reference period (one year in the AES as opposed to four weeks each quarter in the LFS) and in the coverage of lifelong learning activities in each survey.

[7] For countries where data exists, the participation figures based on the Adult Education Survey results are in general higher than the LFS results due to differences in the reference period (one year in the AES as opposed to four weeks each quarter in the LFS) and in the coverage of lifelong learning activities in each survey.

[8] Data for 2003 or 2004 are break in series for many 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.

Participation of adults in continuing vocational training follows a similar pattern with Nordic countries showing the highest rates (over 40%) and Eastern and Southern European countries showing the lowest rates (less than 20%). For more details see section 2 of chapter II.

2. Mobility in Education

Alongside participation in education, learning mobility – for all learners and in all learning experiences – is part of the first strategic objective for the ET 2020 process. Learning mobility contributes not only to personal development and fulfilment but also to enhancing competence in fields like languages and intercultural understanding and, hence, to employability on an increasingly international labour market. This chapter will analyse learning mobility with a particular focus on the educational sector where it is most developed and where data (though still incomplete) are best developed, namely among students in higher education. In addition, it will look at the evidence for learning mobility in the vocational and secondary sectors drawing on data from the Leonardo da Vinci and the Comenius programmes.

2.1. Mobility of higher education students

Higher education is the level where learning mobility is most developed, supported by European (Erasmus) and bilateral programmes. Data availability is better than on other levels, although important gaps remain as regards short term mobility outside programmes. More data are available for the current mobility of students than for the accumulated mobility at graduate level (the proposed benchmark on higher education mobility relates to the mobility rate of those graduating from tertiary education).

The analysis of mobility in this section will focus mainly on four indicators:

- *Foreign students enrolled in tertiary education (ISCED levels 5 and 6) as a percentage of all students enrolled in the country of destination*
- *Percentage of students (ISCED levels 5 and 6) from the country of origin enrolled abroad (in EU, EEA and Candidate countries)*;
- *Inward mobility of Erasmus students*
- *Outward mobility of Erasmus students.*

Foreign students in higher education

About 1.5 million students were enrolled in tertiary education in EU-27 countries in 2008 (the 2007/08 academic year) in countries other than their country of citizenship (EU students studying in another EU country and non EU students studying within the EU). This figure compares with 788 000 in 2000, indicating a very rapid annual expansion over the period 2000-2008 of 8.1% on average and hence faster than the annual growth in student numbers (2.3%). Mobility levels have hence increased.

An increasing share of tertiary students enrolled in Europe comes from outside Europe. The number of students from India and from China grew six-fold from 2000 to 2008, reaching 43 000 from India and 116 000 from China in 2008.

In Cyprus, France, Malta and Portugal more than 80% of all foreign students come from outside the EU, while the corresponding figures in Austria, the Czech Republic, Estonia and Greece were under 40%.
There are several reasons for the high proportion of students from other parts of the world studying in EU-27. Firstly, the underlying data mainly relate to students with foreign citizenship (less data are available on mobile students *per se);* some of these students will in fact be resident in the country where they are studying (see section on quality of data). Another reason could be the wide variety of languages used in higher education in Europe, attracting students from all over the world. Finally, there is clear evidence that students from former colonies of European countries study in the former colonial countries with which they have cultural and linguistic ties.

Figure I.2.1: Foreign and mobile tertiary students as % of all tertiary students (ISCED levels 5 and 6) enrolled in the country (2000-2007)

	Foreign tertiary students		Mobile tertiary students		Annual growth in number of foreign tertiary students
	as % of all tertiary students				
	2000	2008	2007	2008	2000-2008
EU-27	5.0	7.8	:	:	8.3
Belgium	:	12.2	6.4	8.6	1.3
Bulgaria	3.1	3.5	:	3.5	1.8
Czech Rep.	2.2	7.1	5.6	:	22.5
Denmark	6.8	8.3	5.5	2.8	5.6
Germany	9.1	10.9	:	9.3	3.6
Estonia	1.6	3.6	1.4	1.5	27.9
Ireland	4.6	8.8	:	:	8.3
Greece	:	4.2	:	:	21.0
Spain	1.4	3.6	1.8	2.1	13.0
France	6.8	11.2	10.8 (05)	:	7.9
Italy	1.4	3.4	:	:	13.7
Cyprus	19.4	30.2	25.1	27.9	21.1
Latvia	6.6	1.2	1.1	:	-10.2
Lithuania	0.4	1.5	1.0	1.4	25.8
Luxembourg	:	43.8	:	:	:
Hungary	3.2	3.7	3.0	3.3	4.7
Malta	5.6	4.6	0.0	:	4.2
Netherlands	2.9	9.8	4.7	7.8	21.1
Austria	12.4	18.7	12.4	:	7.7
Poland	0.4	0.7	:	:	12.0
Portugal	3.0	4.9	:	2.1	7.6
Romania	2.8	1.3	:	:	1.5
Slovenia	0.9	1.5	1.0	1.2	10.1
Slovakia	1.2	2.4	0.9	2.3	24.3
Finland	2.1	3.7	:	3.1	9.3
Sweden	7.4	8.5	5.4	5.6	4.3
UK	11.0	19.9	14.9	14.7	10.0
Croatia	:	0.7	2.5	:	8.6
Iceland	4.2	4.9	:	4.3	10.5
MK*	0.7	2.0	1.5	2.0	:
Turkey	1.7	0.8	:	:	2.5
Liechtenstein	:	87.7	86.5	82.7	16.9
Norway	4.6	7.6	2.2	2.1	8.1
United States	3.6	3.4 (07)	3.4	3.4	:
Japan	1.5	3.2	2.9	2.9	10.4

Source: UOE data collection (UNESCO, Eurostat, OECD)

Additional notes: DE, SI: Students in advanced research programmes (ISCED level 6) in these countries are excluded.
RO 2000: data exclude ISCED level 6.
Mobile tertiary students: students with residence or prior education in a foreign country
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Figure I.2.2: Main countries of origin of non-national students in the EU

	Foreign students in EU-27 (in 1000)		
	2000	2007	2008
Total	788.5	1430.2	1467.4
Europe	384.4	599.6	608.1
- EU 27	316.4	479.2	487.8
-other Europe	68.0	120.4	120.3
- of which Russia	12.5	29.6	30.2
Africa	134.2	246.0	241.7
Morocco	38.2	46.3	44.2
Algeria	14.9	21.8	20.3
Nigeria	3.5	22.0	23.3
Asia	183.0	405.5	413.5
China	18.6	117.5	115.8
India	6.6	39.3	43.1
Japan	10.7	12.4	10.5
America	63.1	121.6	124.3
USA	22.7	32.2	30.8
Canada	5.8	10.8	10.8
Brazil	6.8	12.9	14.6
Oceania	2.9	7.7	7.1
Australia	2.1	5.6	5.2
Unknown nat.	20.9	49.8	64.3

Source: Eurostat (UOE collection)

Higher education students enrolled outside their country of origin

In 2008, 3.3 million students world wide (slightly more than 2% of all students and an increase of 10.7% compared to 2007) were enrolled outside their country of citizenship. The United States received most foreign students (in absolute terms) with 18.7% of the total. However, in total, the share of the United States foreign students reported to the OECD decreased by over 7 percentage points between 2000 and 2008. The EU accounts for a combined total of about 44% (2000: 41%), of which: UK 10.0%, Germany 7.3%, France 7.3%, Spain (1.9%), Italy (2.0%), Austria (1.6%), Belgium (1.3%), the Netherlands and Sweden (1.0% and 1.2%). After the EU and the US, Australia is placed third as a study destination with 6.9, followed by Canada (5.5%) and Russia (4.3%) (OECD 2010).

For most EU countries, the majority of outwardly mobile students are enrolled in another EU country. The only exception is the UK, where the majority of students studying abroad are studying outside the EU (but it should be noted that a relatively low percentage of UK students studies abroad).
In 2008 on average about 3.5% of EU students were studying abroad, with four out of five of these (2.8%) studying in other EU, EEA or Candidate countries. The 2.8% in 2008 represent about half a million students, an increase of over 50% compared to the year 2000. Outbound mobility has hence progressed considerably since 2000.
Larger countries tend to have a lower proportion of students studying abroad than the smaller countries. This may be attributable to the greater number and range of universities in the larger countries.

Another possible explanation is that students from smaller countries may be more likely to go abroad because they have already acquired the language of one of the larger countries. In addition, patterns of attendance abroad, which predate the development of local university systems, persist. Over 80% of Luxembourg's students are enrolled in other EU, EFTA-EEA or Candidate countries. Cyprus follows with 58% of its students in other European countries; Ireland is third with over 17% and Slovakia comes fourth with 10%. At the other end of the scale come Spain and the UK with less than 1.5% of their students enrolled in other EU, EFTA-EEA and candidate countries.

Figure I.2.3: Percentage of all tertiary students (ISCED levels 5 and 6) enrolled outside their country of origin

	Students (ISCED levels 5 and 6) studying in another EU-27, EEA or Candidate country - as % of all students		
	2000	2007	2008
EU-27	2.1	2.8	2.8
Belgium	2.4	2.6	2.9
Bulgaria	3.2	8.3	7.9
Czech Republic	1.3	2.1	2.6
Denmark	2.7	2.5	2.4
Germany	1.8	3.1	3.5
Estonia	2.5	4.5	4.9
Ireland	9.4	14.2	17.7
Greece	12.4	5.8	5.2
Spain	1.1	1.4	1.2
France	1.8	2.5	2.3
Italy	1.7	1.8	1.8
Cyprus	46.5	56.9	58.4
Latvia	1.3	2.5	2.9
Lithuania	1.8	3.3	3.6
Luxembourg	74.5	:	80.2
Hungary	1.7	1.8	1.8
Malta	8.2	9.9	10.9
Netherlands	1.9	2.1	2.3
Austria	3.8	4.7	4.3
Poland	0.9	1.8	1.8
Portugal	2.3	4.0	4.0
Romania	1.5	2.2	2.0
Slovenia	2.2	2.1	2.1
Slovakia	3	10.2	10.7
Finland	3.2	2.9	2.7
Sweden	2.7	3.0	3.0
United Kingdom	0.6	0.7	0.6
Croatia	:	6.2	6.0
Iceland	16.9	17.8	18.2
MK*	6.2	10.5	8.4
Turkey	3.3	1.5	1.5
Liechtenstein	:	51.0	67.9
Norway	4.7	5.0	5,1

Source: Eurostat (UOE)

Additional notes: DE, SI: Students in advanced research programmes (ISCED level 6) in these countries are excluded.

*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Balance of student flows

The EU-27 is a net receiver of students, since over 700 000 more students with non-EU citizenship are studying in the EU than EU citizens are studying outside the EU. In 2008, 67% of students with foreign citizenship in the EU were from countries outside the EU. This figure included 8% from non-EU European countries, 2 % from the USA and 57% from other parts of the world. The USA is a net receiver of students from EU-27. More than twice as many students go to the USA from the EU as from the USA to the EU. In 2008, 138 000 US students came to study in Europe. However, this figure includes short stays and summer courses. US students who study for one year or longer in the EU amount to only about 30 000 annually (see figure I 2.2).

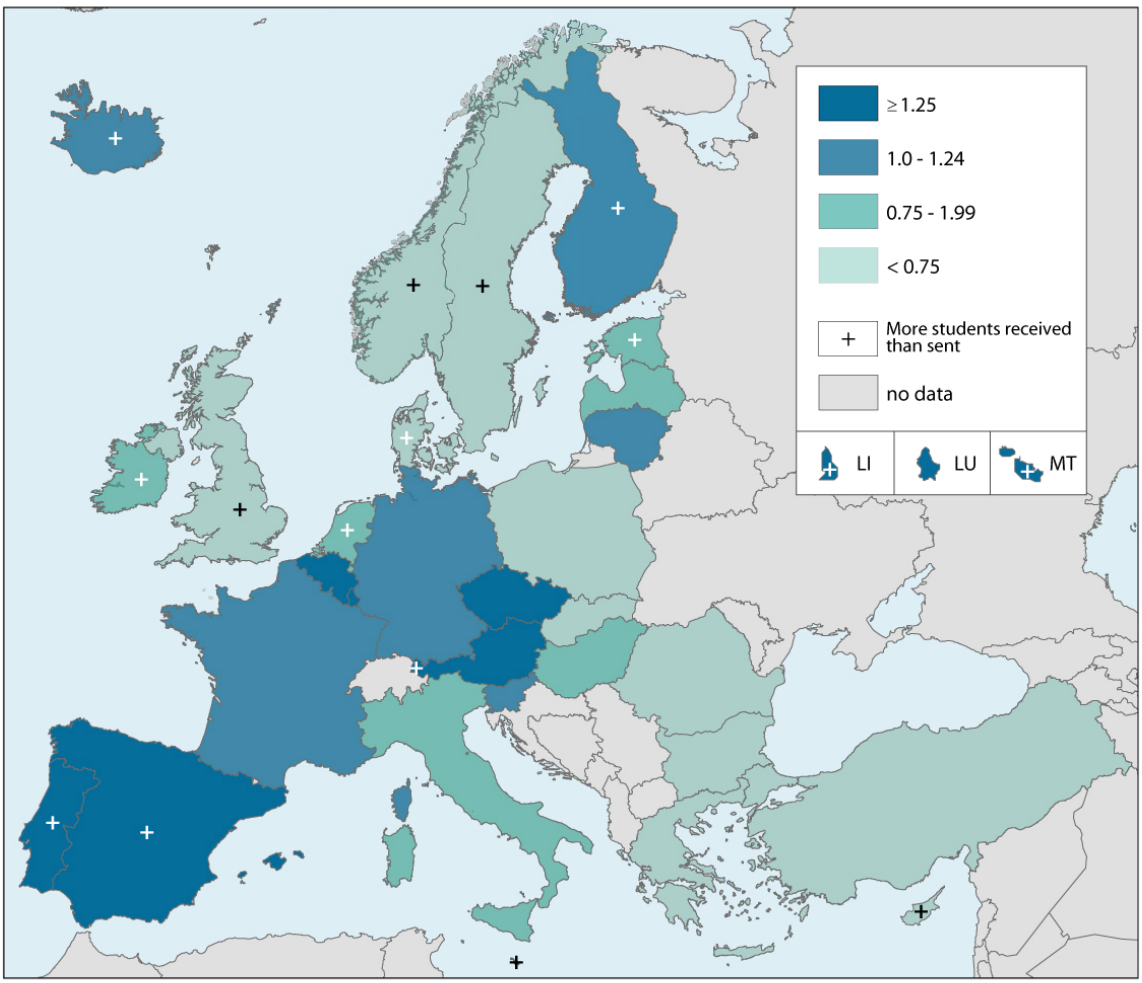
More than 20% of the outgoing students from the Czech Republic, Sweden and the UK study in the USA.
As regards other parts of the world the number of incoming students in the EU exceeds by a factor of more than 10 the number of outgoing students.

2.2. Student mobility programmes

Erasmus mobility

A large proportion of overall mobility is supported through EU programmes such as Erasmus (see figure 1.2.4 and figure 1.2.2).

Figure I.2.4: Outward mobility of Erasmus students, 2008/09 (students sent per 1000 students)



Source: DG Education and Culture (Erasmus programme)

A number of interesting trends can be observed in Erasmus participation rates. The total number of Erasmus students increased by 2.0 % in 2007/08 (1.0 % in EU 27) compared with the previous year. This was much lower than the growth in former years. The increase was, however, substantial in many new Member States and notably in the candidate country Turkey. In 2008/09 growth furthermore picked up again to 3.0%. This increase should also be seen in the context of the increasing number of European universities taking part in the Erasmus programme.

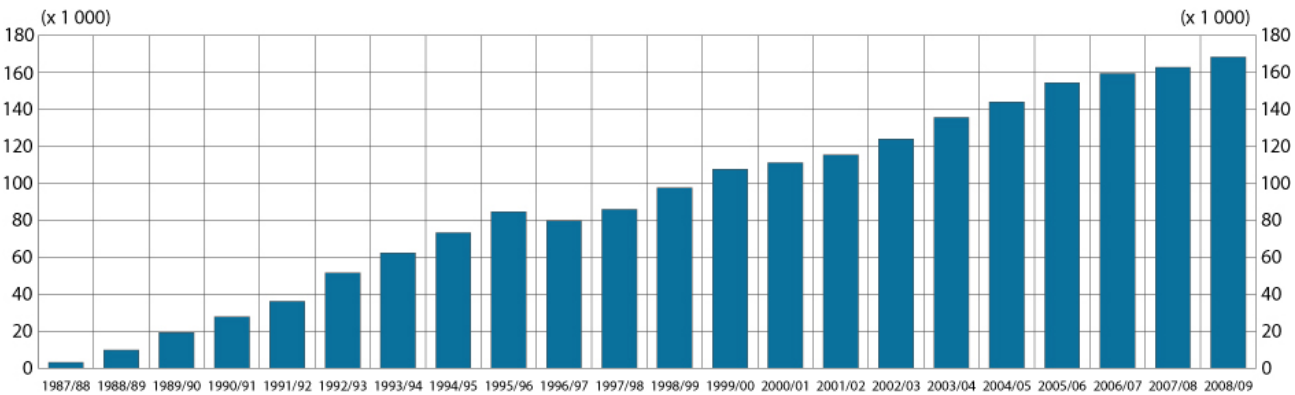
In 2008/09 Erasmus mobility amounted to 198 600 students, of which 30 300 placements (of which EU 29 350) and 168 200 study related mobility periods or 0.8% of the student population in the EU and EEA countries (figure I.2.5 and I.2.6). Furthermore Erasmus supported 36 400 mobility periods for university staff (34 200 from the EU) participated in teaching mobility and 7 800 (of which 7 000 from the EU) participated in Erasmus mobility for staff training.

Figure I.2.5: Mobility of Erasmus students, 2008/09

	Students sent 2008/09	Students received 2008/09	Per 100 students 2006/07	
			Students sent	Students received
EU-27	159750	159750	0,8	0,8
Belgium	5041	5283	1,3	1,3
Bulgaria	1283	393	0,5	0,1
Czech Rep.	5440	3764	1,4	1,0
Denmark	1648	5273	0,7	2,3
Germany	23407	17722	1,0	0,8
Estonia	551	591	0,8	0,9
Ireland	1421	4061	0,8	2,3
Greece	2737	1946	0,5	0,3
Spain	24399	28175	1,4	1,6
France	23560	20955	1,1	1,0
Italy	17754	15530	0,9	0,8
Cyprus	144	234	0,6	0,9
Latvia	1104	401	0,9	0,3
Lithuania	2425	1117	1,2	0,5
Luxembourg	426	53	14,1	1,8
Hungary	3518	2205	0,9	0,5
Malta	142	355	1,5	3,7
Netherlands	4902	6894	0,8	1,1
Austria	4053	4039	1,4	1,4
Poland	11784	4528	0,5	0,2
Portugal	4834	5732	1,3	1,5
Romania	3064	990	0,3	0,1
Slovenia	1132	991	1,0	0,9
Slovakia	1703	787	0,7	0,3
Finland	3436	6115	1,1	2,0
Sweden	2413	8206	0,6	2,0
United Kingdom	7429	16065	0,3	0,7
Iceland	186	353	1.2	2.2
Turkey	6920	2360	0.3	0.1
Liechtenstein	20	34	3.5	4.8
Norway	1317	3041	0.6	1.4

Source: European Commission, DG Education and Culture

Figure I.2.6: Mobility of students in the Erasmus programme



	1987/88	1989/90	1994/95	1999/00	2000/01	2004/05	2005/06	2006/07	2007/08	2008/09	Total
EU-27			72 341	106 418	109 933	141 391	149 933	153 396	155078	159750	1 818 779
Turkey	-	-	-	-	-	1142	2852	4438	6274	6920	21 626
Iceland, Liechtenstein and Norway	-	-	1066	1248	1159	1504	1636	1490	1343	1523	21 017
Total (EU-27 + EEA + CC)	3 244	19 456	73 407	107 666	111 092	144 037	154 421	159 324	162695	168193	2 014 816
Placements EU-27									19085	29349	48434

Source: European Commission, DG Education and Culture

Marie Curie Actions

Mobility at the doctoral level (ISCED level 6) is also supported by Marie Curie Actions - part of the EU Framework Programmes for Researchers and Technological Development (FP). Within FP7 (2007-2013), nearly 12000 young researchers at doctoral level will have undertaken trans-national mobility as part of Marie Curie. In total, the programme, which includes training and career development actions at all levels, from initial to post-doctoral level, has funded approximately 50 000 people. By 2013 the figure is expected to be close to 90000.

Mobility within vocational education and training

Enhancing international mobility within vocational training is a particular challenge, especially as regards longer stays abroad and within apprenticeships. Very little information is available on mobility levels in VET outside the EU programme supported mobility (Leonardo da Vinci programme), but available information implies that currently mobility levels in VET are much lower than in higher education. Currently per year about 0.3 % of students in initial vocational training participate in Leonardo supported mobility. This implies that, assuming an average duration of initial VET of 3 years, a graduate from such programmes has a probability of about 1 % to have participated in Leonardo supported learning mobility. Data available for Germany, however, imply that total mobility in IVET might be considerably higher, taking into account bilateral and regional programmes and free movers (in Germany total mobility in IVET might hence be approaching 5%, mobility levels in the EU as a whole are, however, probably lower, somewhere between 1 and 5%). A Eurobarometer survey that will be carried out in 2011 will shed more light on this.

The Leonardo da Vinci programme also supports VET-mobility within the EU, amounting in 2010 to over 90 000 persons (Figure Annex I.6). Young people participating in initial vocational training accounted for over 65% of total mobility (about 60 000 persons) within this programme. The mobility of people already on the labour market accounted for a further 22% and the mobility of professionals in vocational education and training for the remaining 13%. In 2008 hence about 0.3% of trainees in initial vocational training participated in Leonardo-based international mobility, thrice the mobility level of 2000. Growth in total participation rates since 2008 has been relatively strong.

Figure I.2.7: Number of participants in Leonardo mobility

	2007	2008	2009	2010
Persons in initial vocational training	42847	42854	51778	59254
People on the labour market	16750	13416	15767	19680
Professionals in vocational training	13907	12551	12772	12006
Total	73504	68821	80317	90940

Source: European Commission

School level mobility

In the framework of Comenius school partnerships, over 200 000 EU pupils have profited from learning mobility since 2001. The annual figure has increased from 33 000 in 2001 to about 40 000 in the period 2007-2009. The latter figure represents about 0.1 % of pupils in the corresponding age group. A broadly similar number of staff has profited from Comenius enabled mobility – about 40 000 in EU 27 in 2007-2009.

Figure I.2.8: Mobility within Comenius 2007-2009

	Comenius school partnerships		Comenius assistantships	Comenius IST
	Mobile staff	Mobile pupils	Future teachers	Teachers
	2007-2009	2007-2009	2008	2008
Participation	39518	42525	1014	8744
Of which EU-27	36260	41280	893	8377
Belgium	1218	1024	71	178
Bulgaria	1.090	800	16	158
Czech Rep.	1.450	1.774	25	249
Denmark	n/a	n/a	9	171
Germany	3.221	8.284	135	1.099
Estonia	680	403	5	58
Ireland	842	727	9	209
Greece	3.461	5.012	52	1.073
Spain	1.371	1.810	78	997
France	601	258	20	47
Italy	3.249	4.753	108	700
Cyprus	357	334	4	49
Latvia	977	646	8	106
Lithuania	1.098	829	14	107
Luxembourg	82	183	5	15
Hungary	943	1.382	33	189
Malta	100	47	0	31
Netherlands	n/a	n/a	9	367
Austria	994	993	18	274
Poland	3.023	3.707	104	644
Portugal	1.101	1.119	10	253
Romania	2.308	1.403	15	358
Slovenia	528	415	8	65
Slovakia	991	1.187	15	64
Finland	1.464	1.781	29	202
Sweden	1.575	1.765	18	296
UK	3.536	644	16	352
Iceland	330	57	2	66
Turkey	2139	337	109	274
Liechtenstein	0	0	2	4
Norway	789	851	8	89

Source: European Commission, DG Education and Culture

Mobility outside formal education

Youth learning mobility in non-formal contexts supported by EU programmes is estimated to amount to about 100 000 participants per year. A Eurobarometer survey that will be carried out in 2011 will provide more information on total non-formal learning mobility of young people.

CHAPTER II

Improving the quality and efficiency of education and training

1. School education

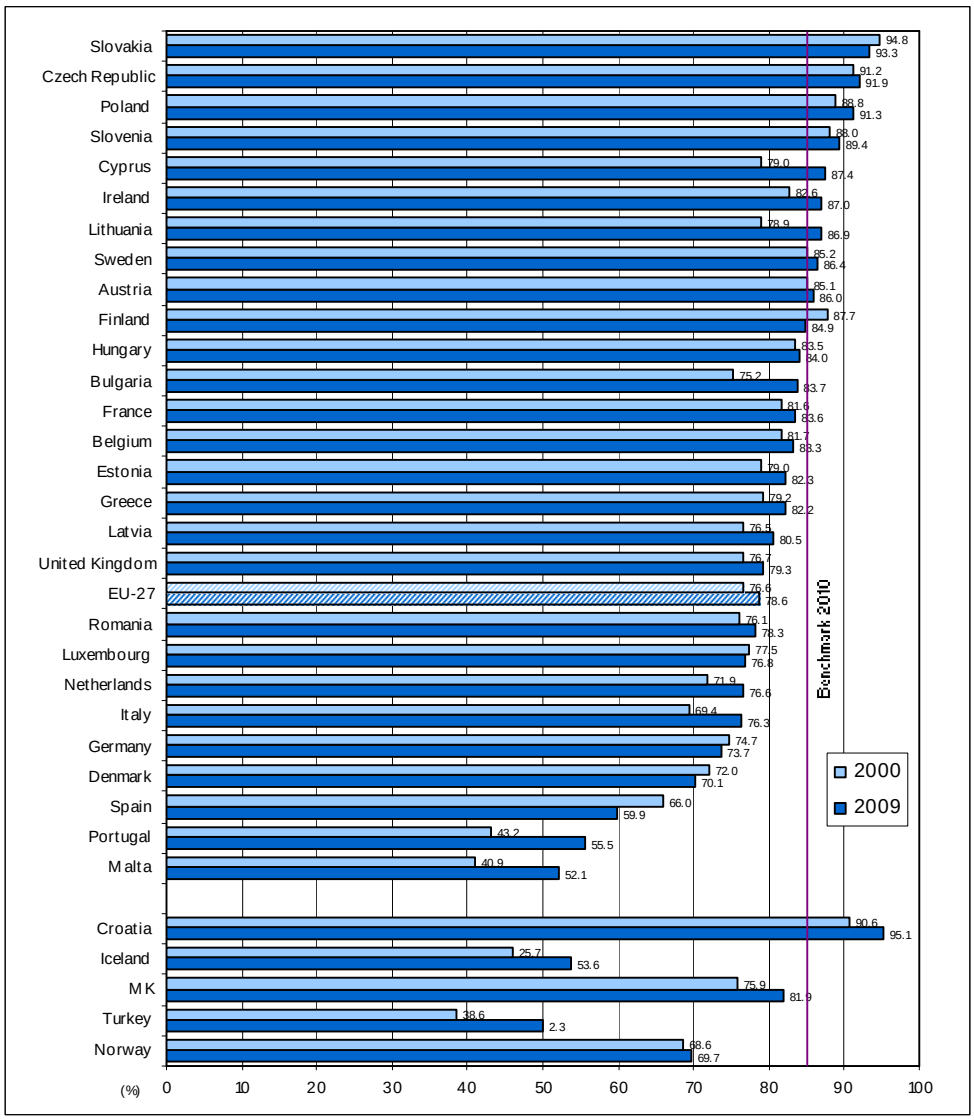
This Section looks at different aspects of school education, focusing on priority fields identified in the Council's conclusions of May 2009, notably completion rates of upper secondary education; and the role of teachers, the profile of the profession and their professional development.

Other crucial areas of improving school education such as combating early leaving of education and key competencies are analysed in the chapter on Equity (Chapter III.1)

1.1 Completion of upper secondary education

Upper secondary attainment is an important indicator for measuring progress in the area of schooling and it is related to the EU benchmark of achieving by 2010 a rate of 85% of young people (aged 20-24) having completed at least upper secondary education.

Figure II.1.1: Population aged 20-24 having completed at least upper-secondary education, 2000-2009

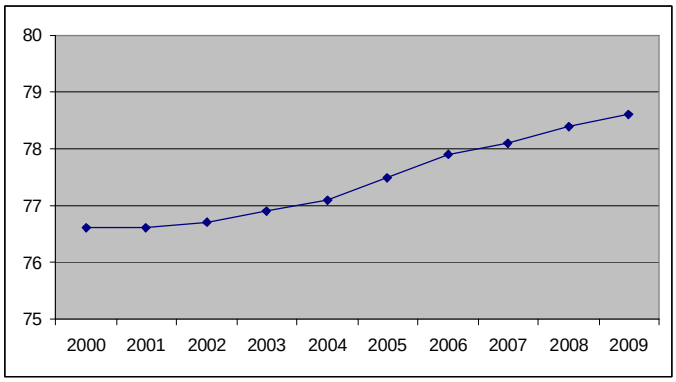


Source: Eurostat (LFS), HR: 2002 instead of 2000,NO, MK: 2006 instead of 2000.
Additional notes:
Breaks in time series in Bulgaria(2001), Denmark (2007), Germany (2005), France (2003), Latvia (2002), Lithuania (2002), Luxembourg (2003), Hungary (2003), Malta (2003), Norway (2006)
CY: Pupils usually living in the country but studying abroad are not yet covered by the survey. Hence results for CY are understated.
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

European benchmark
By 2010 at least 85% of 22-year- olds in the European Union should have completed upper secondary education.[9]

The European benchmark poses a significant challenge for the EU. The present (2008) EU average for the population aged 20-24 is 78.6% and has only moderately improved (by 2 percentage points) since 2000 (on a positive note, progress has slightly accelerated since 2003). Females outperform males by more than 5 percentage points and the large gender gap has been relatively stable since 2000.

Figure II.1.2:
Percentage of young people aged 20-24 in EU 27 with at least upper secondary attainment, 2000-2009



Source: Eurostat (LFS)

In addition to the European benchmark, several Member States have set national targets in this area.[10] Denmark, Greece, Latvia, Netherlands and Belgium (French Community) have set an 85% target. Lithuania and Poland have set a 90% goal for 2010; Ireland has set a 90% goal for 2013, the UK for 2015 and Denmark a 95% goal for 2015. Poland, Lithuania and Ireland already surpass the EU 2010 benchmark and have thus set more ambitious national goals.

Many of the eastern States are already above the 2010 EU benchmark. 3 Member States (Czech Republic, Poland and Slovakia) and Croatia, have already reached over 90% upper secondary attainment. (Figure II.1.1).

Portugal, Malta and Spain, with attainment rates below 60%, have the lowest completion rates in the EU. However, both Portugal and Malta have made substantial progress, increasing by over 10 percentage points since 2000. In Spain upper secondary graduation rates are better than attainment rates for the 18-24 age group and tending to improve, implying that attainment rates will improve too at a later stage. 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 Denmark, Finland, Luxembourg, Slovakia and Spain - and to a lesser degree – in Germany has even fallen. This can be partly explained by a strong net migration to these countries, with many young adults having been educated outside the national education system.

International data for upper secondary attainment of young people are only available for the age group 25-34. In 2007 about 81% of young people in the EU had upper secondary attainment. This compares to an OECD average of 79%, only 47% in Brazil, 87% in the US[11], 91% in Russia and 97% in Korea (South), which has the highest rate world wide, with almost all young people having participated in upper secondary education.

Policy measures to address early school leaving, which has been maintained as a benchmark for 2020 and given new prominence as a headline target within Europe 2020, will have an impact on school completion. Indeed, some Member States in effect see the two objectives as interchangeable and have in their provisional National Reform Programmes based their national actions to fight early school leaving on policy programmes to boost school completion. This can be expected to give new impetus to the effort to improve school completion.

[9] 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).

[10] Belgium-FR: 85%, Denmark: 85%, Greece: 85%, Estonia: 83%, Ireland: 90% (by 2013), Latvia: 85%, Malta: 65%, Hungary: 86%, Lithuania: 90%, Netherlands: 85%, Poland: 90% (2008), Portugal : 65%, Romania: 75%, Slovenia: 85% (for 25-64 year olds), UK-England: 85% (of 19 year olds), UK: 90% (by 2015)

[11] US upper secondary attainment rates are believed to be overstated

1.2 Teachers - Overview

There has been a particularly strong focus on teachers within the policy exchanges on education and training.[12] The quality of teaching has been identified as being the single most important determinant of educational success. In addition, as will be shown in the section on the age profile of the teaching profession, there are significant challenges, shared across the EU, in relation to recruiting and training the teachers of the future.

The teaching profession in the EU counts some 5.9 million teachers in 2008 (1.7% fewer than in 2000), and 1 million pre-primary educators. This represents 3% of the total active EU population. Some Member States have experienced a significant diminution of their teaching workforce since 2000: France (-17%), Slovakia (-17%), Bulgaria (-17%) and Romania (-13%) - at the same time as other countries experienced a significant increase: Ireland (+42%), Luxembourg (+38%), Cyprus (+32%).

Figure II.1.3: Share of female teachers, 2008

	Females as a % of all teachers					
	ISCED 1-3	ISCED 1	ISCED 2	ISCED 3	ISCED 4	ISCED 5-6
EU-27	70.18	84.51	66.39	58.61	54.66	39.54
Belgium	67.05	80.30	60.91	59.72	:	42.48
Bulgaria	82.14	93.47	80.94	76.83	63.30	47.09
Czech Republic	73.16	97.55	74.14	58.31	:	48.01
Denmark	:	:	:	:	:	:
Germany	65.51	85.20	61.57	48.96	44.87	36.73
Estonia	83.44	94.04	80.94	74.89	:	:
Ireland	73.69	84.46	:	63.68	:	38.35
Greece	:	:	:	:	:	:
Spain	63.56	75.20	57.89	49.14	:	38.20
France	66.21	82.36	64.58	53.39	:	37.34
Italy	76.44	95.31	71.38	59.71	:	35.22
Cyprus	70.31	82.39	69.05	57.11	:	39.68
Latvia	85.48	92.89	82.94	79.54	70.10	57.16
Lithuania	84.70	97.32	81.50	:	69.25	55.49
Luxembourg	58.21	71.66	:	47.78	:	:
Hungary	78.68	95.90	78.55	64.83	52.35	38.01
Malta	71.30	88.18	65.23	41.14	0	29.86
Netherlands	67.74	83.79	:	47.37	:	37.64
Austria	69.61	89.19	69.16	51.90	52.63	32.45
Poland	76.24	83.79	74.35	66.43	62.37	42.54
Portugal	73.40	79.76	70.57	67.20	:	43.22
Romania	72.25	85.94	68.47	65.91	67.59	43.30
Slovenia	79.01	97.51	78.93	64.82	72.00	37.8%
Slovakia	77.54	89.34	77.66	70.36	51.72	43.83
Finland	69.04	78.35	71.19	57.68	:	50.82
Sweden	68.76	81.01	66.59	52.24	48.04	44.13
United Kingdom	68.66	81.44	62.53	63.28	64.74	41.69
Croatia	73.39	91.35	73.07	65.28	:	41.63
Iceland	72.34	80.32	:	53.33	:	48.97
MK	60.96	76.64	52.24	57.02	:	44.10
Turkey	47.31	49.85	:	41.40	:	40.35
Liechtenstein	62.92	76.20	51.64	37.25	50.00	0
Norway	67.10	73.79	73.79	49.10	:	41.16

Source: EUROSTAT (UOE)

MK: The former Yugoslav Republic of Macedonia; see Annex 2
*EU27 calculated with average of countries
For country specific notes see:
http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=EDUC_PERS1D

Women represent a large majority of teachers

In primary and secondary education, women account for more than 70% of teachers in the EU and represent more than 60% in all the Member States, except Luxembourg (see figure II.1.3). On average (EU-27) there are very clear differences between the different levels of schooling. The higher the educational level in which they are employed, the smaller is the female dominance in the teacher profession. In primary education (ISCED level 1),

[12] See, for example, the three recent statements by Ministers of Education on this topic :
Conclusions of the Council of November 2007 on improving the quality of teacher education (Official Journal C 300, 12.12.2007)
Conclusions of the Council of 21 November 2008 on preparing young people for the 21st century: an agenda for European cooperation on schools (OJ 2008/C 319/08)
Conclusions of the Council of 26 November 2009 on the professional development of teachers and school leaders (OJ 2009/C 302/04)

more than 80% of teachers are female. At lower secondary education (ISCED 2) 66%, while less than 60% of teachers in upper secondary education (ISCED 3) are women. Among the academic staff (ISCED 5-6) women represent on average 39.5% of teachers.

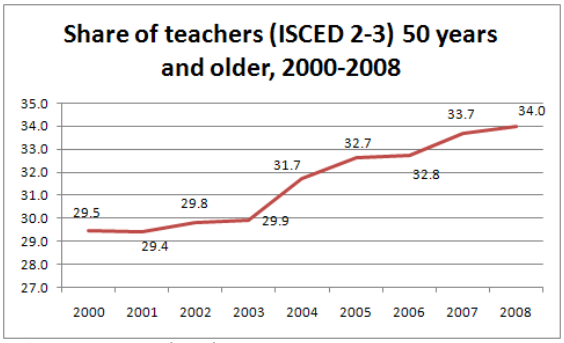
Figure II.1.4: Age distribution of school teachers, 2008

Teachers by age (%), by ISCED level	Less than 30 years old	Less than 30 years old	50 years and older	50 years and older
	ISCED 1	ISCED 2-3	ISCED 1	ISCED 2-3
EU-27	**15.0**	**12.0**	**28.5**	**34.0**
Belgium	23.1	16.4	20.4	32.8
Bulgaria	3.9	7.0	23.5	35.6
Czech Republic	13.1	9.8	34.0	32.7
Denmark	9.5	:	38.6	:
Germany	6.1	3.2	50.3	50.4
Estonia	10.3	9.9	29.7	43.8
Ireland	26.2	13.4	27.3	32.1
Greece	:	:	:	:
Spain	14.2	7.2	31.4	28.0
France	15.8	9.3	20.0	34.3
Italy	1.4	0.5	42.0	56.2
Cyprus	34.9	15.5	2.9	20.8
Latvia	9.6	9.9	35.7	38.8
Lithuania	5.8	10.5	29.1	35.8
Luxembourg	28.9	20.0	23.0	28.8
Hungary	10.8	12.5	22.5	29.2
Malta	32.0	29.7	23.8	20.9
Netherlands	20.3	11.5	33.8	44.6
Austria	8.3	5.9	34.7	37.8
Poland	16.4	17.6	11.8	19.7
Portugal	11.0	10.4	29.2	22.1
Romania	19.4	20.6	30.9	33.6
Slovenia	11.1	8.8	16.0	26.5
Slovakia	17.0	16.4	25.5	35.8
Finland	10.4	8.4	28.2	37.1
Sweden	5.1	8.1	48.8	41.5
United Kingdom	24.6	18.1	27.4	30.9
Croatia	:	:	:	:
Iceland	12.1	7.0	30.8	46.2
MK*	11.0	14.8	25.0	30.4
Turkey	:	:	:	:
Liechtenstein	11.1	11.7	29.2	27.0
Norway	11.6	8.1	36.2	43.8

Source: EUROSTAT (UOE),
*MK: The former Yugoslav Republic of Macedonia; see Annex 2
EU27 calculated with the average of countries
For country specific notes see:
http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=EDUC_THPERTCH

The teaching profession is aging.
Currently (2008) 34.0% of all secondary teachers in the EU are 50 years and older.

Figure II.1.5: Share of teachers (ISCED 2-3) 50 years and older, 2000-2008



Source: Eurostat (UOE)

There are big differences between Member States in the proportion of teachers aged over 50 (Figure II.1.4). More than 50% of secondary teachers are over 50 in Germany and Italy. Most of the other Member States have less than 40% of teachers of older than 50 years of age in secondary education. The share of secondary teachers under 30, on the other hand, was in 2007 less than 3% in Germany and Italy, but more than 20% in Luxembourg, Romania and Malta.

Figure II.1.6: Ratio of pupils to teachers, 2008

	Ratio of pupils to teachers			
	ISCED 1-3	ISCED 1	ISCED 2	ISCED 3
EU-27	13.6	15.5	13.1	11.7
Belgium	10.8	12.6	8.1	10.8
Bulgaria	12.8	16.1	12.0	11.5
Czech Republic	14.2	18.1	11.8	14.0
Denmark	10.1	10.1	:	:
Germany	16.7	18.0	15.0	14.0
Estonia	14.8	16.4	16.0	12.4
Ireland	15.4	17.8	:	12.9
Greece	:	:	:	:
Spain	11.2	13.1	10.3	8.7
France	14.4	19.9	14.6	9.4
Italy	10.7	10.6	9.7	11.8
Cyprus	12.3	15.0	10.8	10.6
Latvia	11.3	12.8	9.2	11.9
Lithuania	8.2	9.7	7.7	:
Luxembourg	10.3	12.1	:	9.0
Hungary	11.3	10.6	10.9	12.3
Malta	9.2	10.6	7.1	15.3
Netherlands	15.8	15.8	:	15.8
Austria	11.0	12.9	9.9	10.5
Poland	11.6	10.5	12.9	12.2
Portugal	9.2	11.3	8.1	7.3
Romania	14.3	16.3	12.5	14.8
Slovenia	12.5	15.8	8.9	13.5
Slovakia	15.6	18.6	14.5	15.1
Finland	13.9	14.4	10.6	15.9
Sweden	12.7	12.2	11.4	14.7
United Kingdom	15.7	20.2	15.0	12.4
Croatia	13.0	16.6	12.1	11.3
Iceland	10.2	10.0	:	10.6
MK*	15.1	17.4	12.8	15.8
Turkey	22.2	24.4	:	17.0
Liechtenstein	8.9	9.1	8.6	8.6
Norway	10.4	10.8	10.1	9.9

Source: Eurostat (UOE),
Note: Data for DK, FR, MT, PT, FI, UK refer to 2005
*MK: The former Yugoslav Republic of Macedonia; see Annex 2
For country specific notes see:
http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0,1136184,0_45572595&_dad=portal&_sche ma=PORTAL

Teachers teach, on average, more students in primary education than in secondary. *The average student-*teacher ratio in primary education is 16 students per teacher, while for upper secondary it is 12. The difference in student teacher ratio between educational levels varies greatly between countries. In the case of the UK there is a difference of more than 8 students in the ratio of primary and upper secondary (see figure II.1.6).

Figure II.1.7: Percentage of 15 year old 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
Iceland	25.4	16.3	7.8	20.9
MK**	:	:	:	:
Turkey	65.6	63.4	58.7	62.9
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.
**MK: The former Yugoslav Republic of Macedonia; see Annex 2

Shortage of qualified teachers is a serious problem in almost all countries. *Head teachers in the EU report a* lack of appropriate teaching staff hindering quality instruction.[13] 14% of all pupils are taught in schools where instruction was hindered by the lack of qualified teachers. Luxembourg, Belgium and Estonia are among those most affected by such a situation whereas almost no head teachers in Portugal and Poland report this phenomenon (figure II.1.7).

1.3 Teachers and their professional development

Improving the quality of initial teacher education, ensuring that all new teachers have access to systematic professional and personal support ("induction") during their first years in service and that practising teachers take part in continuous professional development have been identified as key factors in securing the quality of school education.[14]

To support policies in this field the Council in May 2005 and May 2007 invited[15] the Commission to co-operate with the OECD on the development of the 'Teaching and Learning International Survey' (TALIS).

[13] See PISA 2006.

[14] Ibid.
- 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.

[15] This demand for indicators on teachers' professional development was part of a wider framework of 16 core indicators for monitoring progress towards the Lisbon objectives identified by the Council.

What is TALIS?

With a focus on lower secondary education in both the public and private sectors, TALIS examined important aspects of professional development; teacher beliefs, attitudes and practices; teacher appraisal and feedback; and school leadership in the 23 participating countries. TALIS looks at these factors through the eyes of teachers and school principals. This innovative approach was chosen in order to examine how the intended school and teacher policies of education systems are actually perceived and implemented in schools and classrooms.

Twenty four countries took part in TALIS, including 19 European Countries (EU:16) : Austria, Belgium, Bulgaria, Denmark, Estonia, Hungary, Iceland, Ireland, Italy, Lithuania, Malta, Netherlands, Norway, Poland, Portugal, Spain, Slovak Republic, Slovenia and Turkey. And 5 non-European Countries: Australia, Brazil, Republic of Korea, Malaysia and Mexico.

The following analysis is based on a secondary analysis of the TALIS dataset undertaken jointly by the European Commission and the OECD and published in 2010 in a report entitled "Teachers' professional development – Europe in International Comparison".

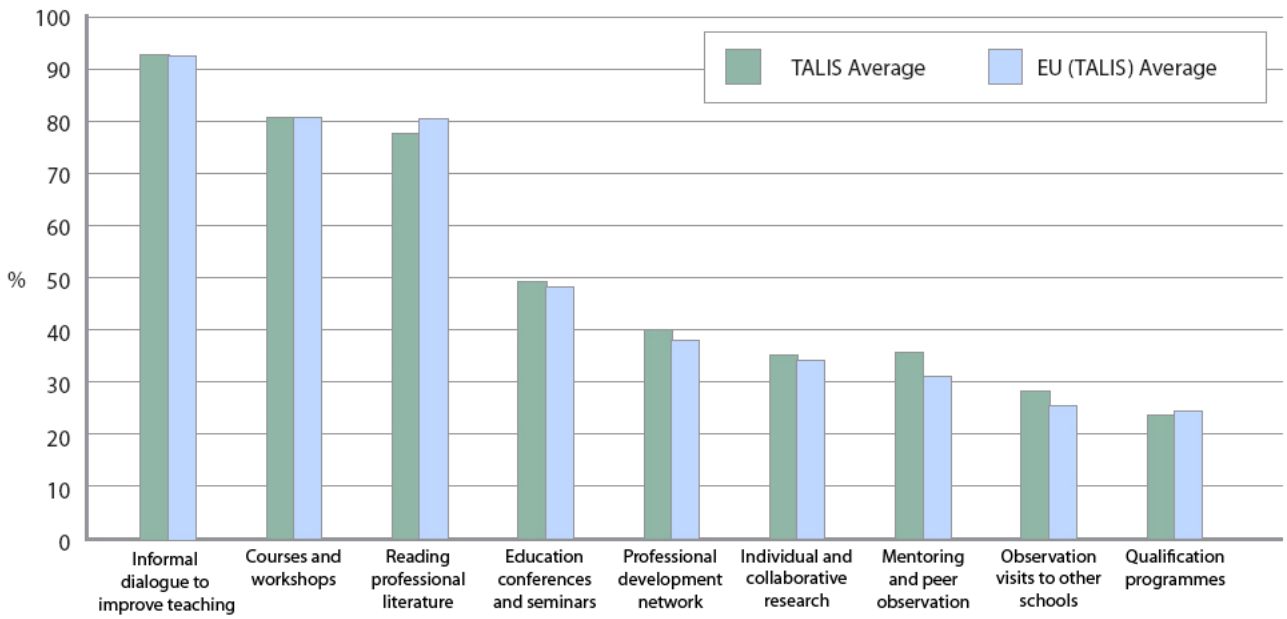
Types of professional development undertaken

Teachers were asked about a wide range of activities from more organised and structured to more informal and self-directed learning.[16]

The most common type of professional development undertaken across countries was 'Informal dialogue to improve teaching', with an average of 93% of teachers participating in teachers' professional development reporting having engaged in this in the 18 months prior to the survey (figure II.1.8). Indeed in practically all countries it was the most frequently reported development activity by teachers, with more than 90% of teachers participating in each country. For Hungary, the highest reported participation was in 'Reading professional literature' (88%) and for Mexico it was attendance of 'Courses and workshops' (94%).

The next most frequently reported activity on average across the 23 countries, was attending 'Courses and workshops'(81%) and 'Reading professional literature' (78%), while the least common types of professional development that teachers took part in were 'Qualification programmes'(25%) and 'Observation visits to other schools' (28%).

Figure II.1.8: Participation rates for type of professional development activity (2007-08)



Source: Joint EU/OECD thematic report "Teachers Professional Development: Europe in international comparison"

[16] As with all self-reporting, the results of TALIS need to be interpreted with caution.

Teachers' participation in professional development

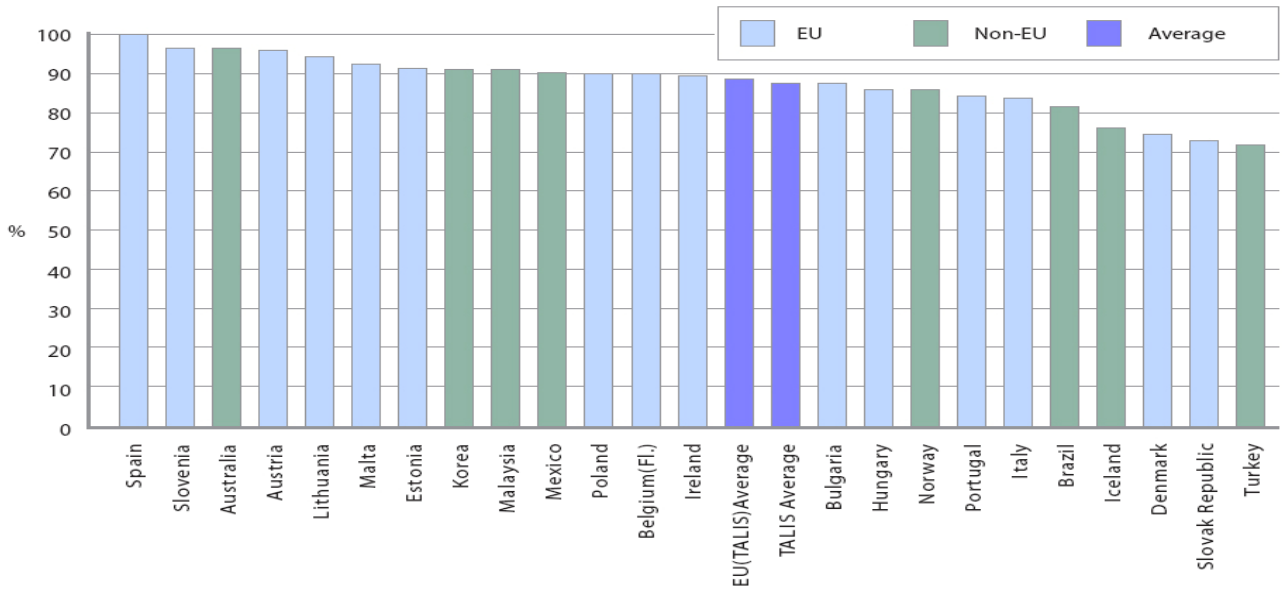
Figure II.1.9 shows the comparative country level participation rates in professional development in the 18 months prior to the survey. On average across the 23 participating countries, 89% of teachers reported that they undertook some professional development over the period. This is a very high figure and provides a positive sign that on average, engagement in professional development activities is a feature of the lives of the vast majority of teachers across the participating countries. However, the fact that 11% of lower secondary teachers did not take part in any development activities in the period prior to the survey provides some cause for concern.

Core indicator on teachers' professional development

Within the framework of the on-going determination of the content of the second round of TALIS and the 2012 revision of the coherent framework of indicators and benchmarks, the European Commission uses "the percentage of teachers who undertook some professional development in the previous 18 months" as the core indicator for measuring progress on teachers' professional development.

When participation rates are compared across countries, there are some notable differences. In Spain all teachers reported having participated in some development while in Australia, Austria, Lithuania and Slovenia participation is virtually universal with less than 5% of lower secondary teachers not having participated in development activities in the previous 18 months.[17] This contrasts with the situation in Denmark, Iceland, the Slovak Republic and Turkey, where around one quarter of teachers reported that they had not participated in professional development during this period.

Figure II.1.9: Percentage of teacher who undertook some professional development in the previous 18 months (2007-2008)



Source: Joint EU/OECD thematic report "Teachers Professional Development: Europe in international comparison"
Note: Countries are ranked in descending order of percentage of teachers having had some professional development in the 18 months prior to the survey

Intensity of participation in professional development

TALIS measures the intensity of participation in terms of the number of days of professional development that teachers reported to have taken in the 18 months prior to the survey.

On average among all lower secondary teachers in the participating countries, teachers say that they undertook 15.3 days of professional development over the period – in other words an average of just over one day per month. For the EU countries this average was 14.6. But there is significant variation between countries. The highest average number of days for the EU countries, reported by lower secondary teachers was in Bulgaria, Italy, Poland and Spain (all 26 to 27 days) and the lowest number was reported by teachers in Ireland (5.6 days), Slovakia (7.2 days), Malta (7.3 days), Belgium (Fl.) (8.0 days) and Slovenia (8.3 days). Within the EU, therefore, there is a five-fold difference between the highest and lowest intensity of participation.

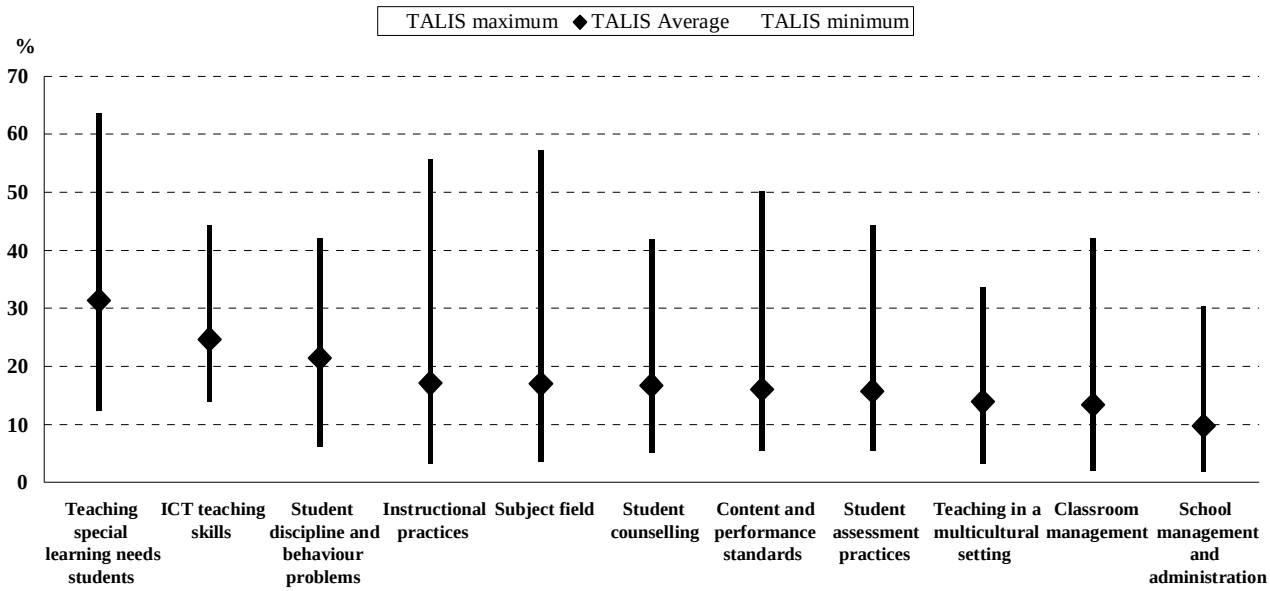
[17] In Spain some 18% is missing on this variable, which is much higher than in other countries (< 10%, on average 7%). It seems that in Spain non-participation is coded as missing rather than zero days.

The joint European Commission & OECD report (2010) analyses how intensity of participation in professional development varies by teacher and school characteristics. The report shows that the amount of professional development that teachers received decreased with age. Averaged across EU countries, teachers under the age of 30 received around 21 days of professional development. For teachers aged 50 or more the average was around 14 days. Moreover, teachers with a master's degree or higher qualification received more days of professional development (some 20 days in the 18th months prior to the survey) than those with a bachelor's degree or less (17-18 days). This trend is evident in almost all participating EU countries, the exceptions being Austria, Belgium (FL.), Hungary and the Slovak Republic, where teachers with masters degree or higher received the least number of days on average.

What are the areas of greatest development need?

Teachers were asked to rate on a four point scale the degree of development need they had in various aspects of their work (Figure II.1.10).

Figure II.1.10: Areas of greatest development need of teachers (2007-08)
TALIS-Average and range of percentage of teachers reporting a high level of need



Source: Joint EU/OECD thematic report "Teachers Professional Development: Europe in international comparison"

The aspect of teachers' work that was the most frequently rated by teachers as an area of high development need, was 'Teaching special learning needs students'. Almost one third of teachers rated their development need in this area as high.

Given that the TALIS target population excludes teachers who only teach special learning needs students, this high development need reported in TALIS is quite significant. It is probably a refection of two current trends in educational policy: the first one is the integration of pupils with special learning needs in mainstream schools (inclusive education) and the second the growing emphasis on equity. In contrast, the aspect of teachers' work that, on average, was least frequently reported as a high development need, was 'school management and administration'.

Impact of professional development

It is striking how positively teachers view the impact of these development activities and how consistent this is across all types of development activities. (Figure II.1.11). On average across participating countries, teachers reported that the most effective forms of development were "Individual and collaborative research", "Informal dialogue to improve teaching" and "Qualification programmes", all with close to 90% of teachers reporting a moderate or large impact on their development as a teacher. The development activities that were reported to be relatively less effective were attendance at "Education conferences and seminars" and taking part in "Observation visits to other schools", though even for these activities almost 75% of teachers reported a moderate or high impact.

Figure II.1.11: Impact of different types of professional development undertaken by teachers upon their development as a teacher (2007-08)

Percentage of teachers of lower secondary education reporting that the professional development undertaken in the previous 18 months had a moderate or high impact upon their development a teacher

	Courses and workshops		Education conferences and seminars		Qualification programmes		Observation visits to other schools		Professional development network		Individual and collaborative research		Mentoring and peer observation		Reading professional literature		Informal dialogue to improve teaching	
Countries	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)
Austria	75.7	(0.89)	55.5	(1.24)	89.0	(1.21)	61.0	(2.99)	68.6	(1.33)	88.4	(0.96)	72.7	(1.63)	82.4	(0.69)	84.9	(0.71)
Belgium (Fl.)	52.9	(1.26)	42.6	(1.82)	67.0	(2.01)	47.0	(2.84)	53.9	(1.92)	67.6	(1.52)	48.1	(2.64)	57.8	(1.20)	71.7	(1.05)
Bulgaria	84.2	(1.58)	80.6	(1.67)	88.0	(2.06)	79.3	(3.00)	86.2	(1.83)	87.1	(1.70)	86.0	(1.68)	92.3	(1.21)	86.3	(1.20)
Denmark	86.0	(0.96)	82.9	(1.70)	96.8	(1.18)	83.6	(3.34)	88.1	(1.32)	94.6	(0.86)	78.7	(3.45)	84.9	(1.14)	92.8	(0.89)
Estonia	86.4	(0.74)	70.4	(1.52)	90.4	(0.99)	69.9	(1.27)	84.3	(1.06)	90.5	(1.04)	76.8	(1.58)	87.3	(0.70)	81.8	(0.94)
Hungary	86.0	(1.04)	78.2	(1.46)	93.1	(0.93)	81.4	(1.74)	84.8	(1.11)	93.8	(1.30)	91.1	(1.00)	92.6	(0.78)	92.9	(0.89)
Ireland	81.9	(0.96)	74.5	(1.55)	92.5	(1.53)	81.0	(4.35)	78.7	(1.36)	86.8	(1.41)	71.3	(2.81)	71.0	(1.55)	83.0	(1.00)
Italy	81.9	(1.17)	78.5	(1.16)	86.8	(1.58)	82.6	(2.06)	86.6	(1.06)	95.1	(0.45)	89.6	(1.03)	90.9	(0.60)	90.6	(0.47)
Lithuania	91.4	(0.62)	83.2	(1.03)	88.2	(1.26)	90.7	(0.81)	90.0	(0.94)	91.4	(0.78)	85.2	(1.24)	96.2	(0.41)	92.0	(0.64)
Malta	73.9	(1.65)	70.0	(2.47)	94.4	(1.56)	69.8	(3.87)	75.2	(2.45)	89.8	(1.57)	67.8	(3.78)	78.1	(1.83)	84.3	(1.29)
Poland	86.3	(0.73)	75.8	(1.31)	92.1	(0.97)	78.2	(2.29)	88.3	(0.91)	92.8	(0.90)	77.9	(1.11)	93.4	(0.49)	90.0	(0.70)
Portugal	82.8	(0.88)	73.0	(1.38)	87.0	(1.12)	67.4	(1.82)	80.7	(2.04)	94.0	(0.76)	87.6	(1.84)	78.9	(1.04)	88.1	(0.68)
Slovak Republic	75.5	(1.57)	75.9	(1.44)	83.0	(1.43)	66.0	(2.02)	78.0	(1.93)	83.8	(3.72)	78.6	(1.10)	88.8	(1.03)	85.9	(0.85)
Slovenia	83.3	(0.73)	78.6	(0.91)	80.2	(2.43)	77.3	(2.74)	64.1	(1.30)	89.9	(1.44)	76.1	(1.53)	81.5	(0.85)	87.0	(0.74)
Spain	76.5	(0.94)	71.8	(1.75)	73.1	(1.97)	76.2	(2.31)	81.5	(1.49)	89.9	(0.89)	81.1	(1.49)	74.4	(1.01)	80.2	(0.74)
EU (TALIS) Average	***80.3***	*(0.28)*	***72.8***	*(0.40)*	***86.8***	*(0.40)*	***74.1***	*(0.69)*	***79.3***	*(0.40)*	***89.0***	*(0.38)*	***77.9***	*(0.53)*	***83.4***	*(0.27)*	***86.1***	*(0.23)*
Australia	78.5	(1.04)	67.6	(1.32)	78.6	(2.67)	72.2	(2.26)	73.5	(1.27)	85.8	(1.53)	72.5	(1.40)	66.4	(1.28)	86.0	(0.85)
Brazil	76.1	(1.07)	72.9	(1.32)	89.9	(0.93)	67.5	(1.49)	73.4	(1.91)	80.9	(1.26)	65.8	(1.66)	82.6	(1.09)	76.5	(0.99)
Iceland	83.0	(1.13)	73.7	(1.75)	92.4	(1.76)	80.5	(1.37)	90.6	(0.85)	94.2	(1.70)	77.8	(2.09)	88.7	(0.97)	91.8	(0.85)
Korea	79.2	(0.87)	75.1	(1.36)	84.2	(1.37)	65.2	(1.15)	85.4	(1.01)	89.9	(0.82)	69.5	(1.17)	77.4	(1.22)	85.8	(0.67)
Malaysia	94.4	(0.48)	89.1	(1.05)	95.0	(0.88)	87.6	(1.30)	90.3	(0.97)	88.8	(1.17)	89.9	(0.89)	86.4	(0.78)	92.2	(0.49)
Mexico	85.4	(0.77)	82.2	(1.54)	91.3	(1.03)	77.7	(1.65)	81.3	(1.69)	91.0	(0.69)	78.3	(1.59)	84.0	(0.98)	81.6	(0.92)
Norway	79.3	(0.96)	73.7	(1.46)	93.7	(1.24)	71.9	(2.39)	81.1	(1.83)	95.3	(1.39)	77.9	(2.62)	78.1	(0.93)	95.7	(0.44)
Turkey	72.9	(1.78)	74.1	(1.65)	79.3	(3.77)	87.8	(1.99)	80.5	(1.43)	92.3	(2.11)	84.8	(1.77)	91.3	(1.17)	92.8	(1.01)
TALIS Average	***80.6***	*(0.23)*	***73.9***	*(0.31)*	***87.2***	*(0.35)*	***74.9***	*(0.50)*	***80.2***	*(0.31)*	***89.3***	*(0.30)*	***77.6***	*(0.41)*	***82.8***	*(0.22)*	***86.7***	*(0.18)*

Source: Joint EU/OECD thematic report "Teachers Professional Development: Europe in international comparison"
Note: Scores from a 4-point scale: 1= No impact; 2= A small impact; 3= A moderate impact; 4= A large impact

Duration and variety of activities proposed, teachers' motivation, feedback as part of school policy, and school climate are important factors in the perceived impact of professional development by teachers.

Finally, the joint European Commission and OECD report (2010) presents key conclusions regarding the perceived impact of teachers' professional development by teachers themselves. These conclusions are based on a structural model using TALIS dataset to describe the relations between school and teacher-related variables, teachers' participation in professional development and its perceived impact. According to this analysis, four factors play an important role:

- Duration and variety of activities proposed,
- Teachers' motivation,
- Feedback as part of school policy,
- School climate.

Duration and variety of activities proposed

When teachers participate in various professional learning activities and spend more days on professional development, they find that professional development has a greater impact on their work. For professional development to become effective for teachers' practice and improved student learning, teachers should spend a good deal of time in professional development and especially on different activities.

Teachers' motivation

Teachers who have greater professional development needs find that professional development has a stronger impact on their work. These findings indicate that teachers' motivation plays an important role in fostering professional development.

Feedback as part of school policy

Feedback, as part of school policy, is strongly linked to teachers' professional development and to its impact. By emphasizing teacher appraisal and feedback, policy makers, administrators and school leaders can contribute to the development of schools as organizations that foster continuous professional learning and sustained improvement.

School Climate

Teachers who feel good about their job and in their school view the effects of their professional development more positively. By promoting a positive school climate and high levels of trust in schools, principals can create a supportive environment for teacher learning.

2. Vocational education and training

The major importance of vocational education and training (VET) for individuals, enterprises and society is widely acknowledged. VET is a key element of lifelong learning. It has the capacity to contribute to both excellence and equity in EU lifelong learning systems and to the Europe 2020 objectives of smart and inclusive growth and also to its flagship action, the Agenda for New Skills and Jobs. VET must play a dual role: as a tool to help meet Europe's immediate and future skills needs and, in parallel, to reduce the social impact of and facilitate recovery from the crisis.

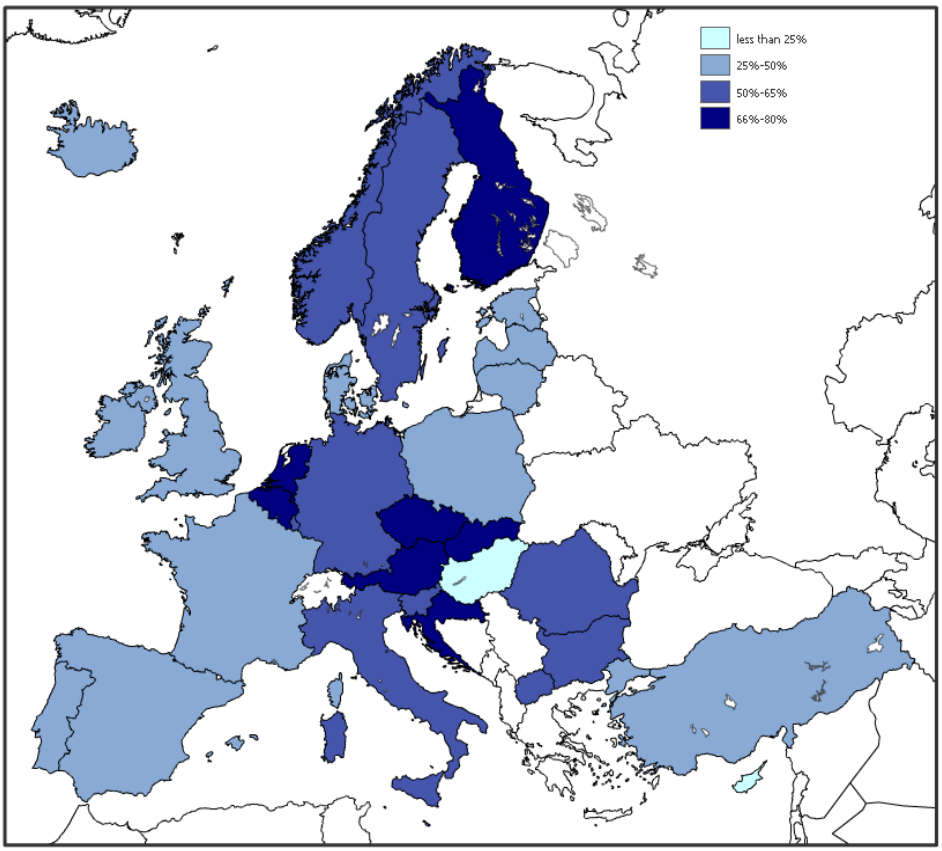
This part of the report will look into participation patterns in initial VET as participation in adult job-related training in European countries. Some issues related to the entry of VET graduates to the labour market and to other educational outcomes will also be discussed.

2.1. Participation in initial vocational education and training

As reiterated in the Bruges Communiqué[18], initial VET should be an attractive learning option with high relevance to labour market needs and should provide pathways to higher education. In the current economic crisis with high unemployment rates among young people, the contribution of VET to employability and economic growth, and in responding to broader societal challenges such as promoting social cohesion, is of great importance. It also has a major role to play in the policy response to early school leaving, the fight against which has been highlighted as one of the headline targets for EU socio-economic policy in the Europe 2020 strategy.

In the school year 2008/09 at the EU level, half of all students at upper secondary level of education (ISCED level 3) were enrolled in vocational programmes; among the member states, the proportion ranged from 13% in Cyprus to over 77% in Austria and Liechtenstein. High proportions of students following a vocational programme (over two thirds) are also registered in Belgium, the Czech Republic, Slovakia, Finland, Netherlands and Croatia (*see figure II.2.1*).

Figure II.2.1: Participation patterns in initial VET in European countries (2008)
Students in vocational programmes at ISCED level 3 as percentage of all ISCED 3 students

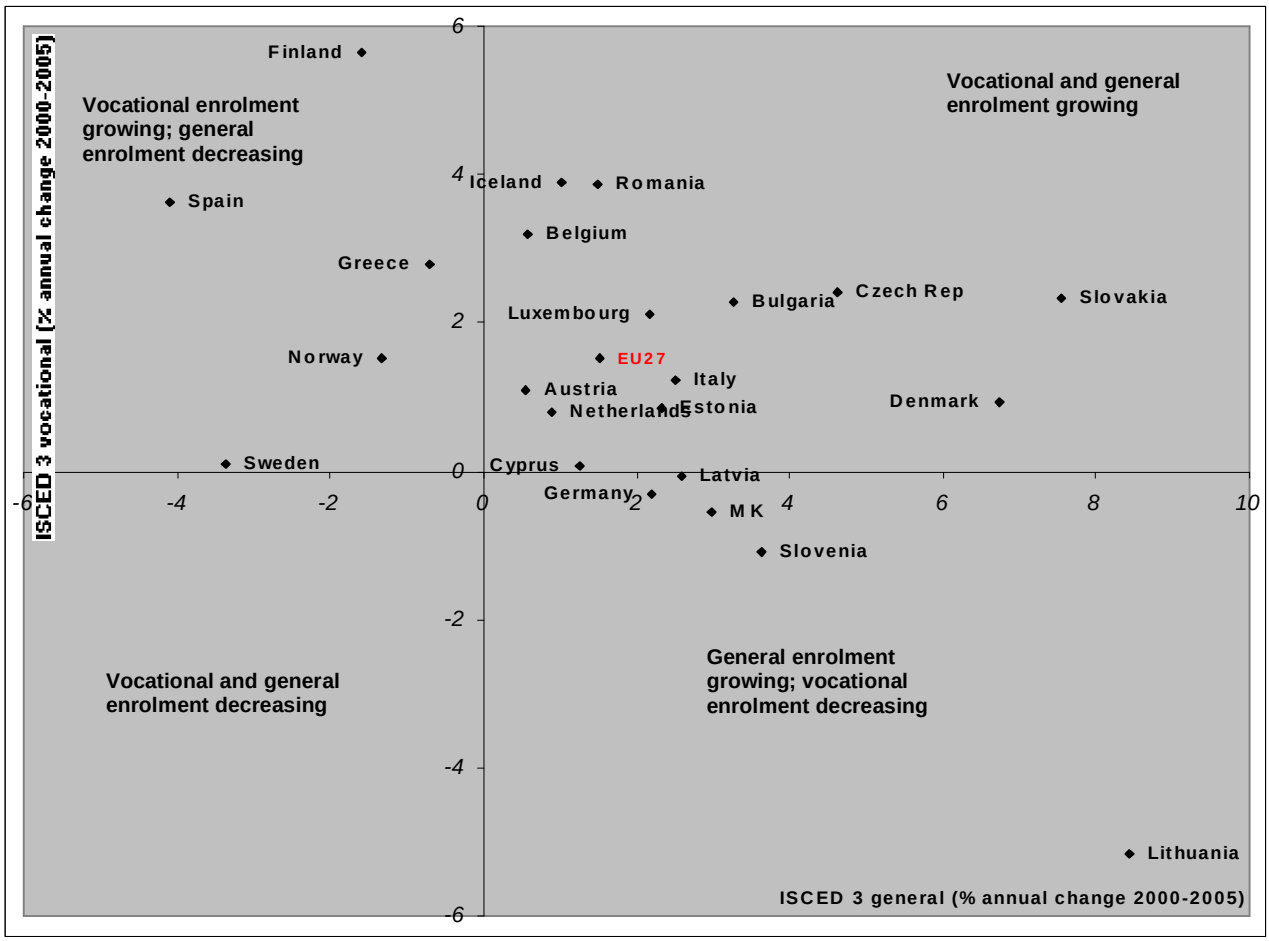


Source: DG Education and Culture - *Data source:* Eurostat (UOE)

[18] The Bruges Communiqué on enhanced European Cooperation in Vocational Education and Training for the period 2011-2020

At the EU level, the number of students enrolled in vocational programmes increased by 8% between 2000 and 2005, while total upper secondary enrolments went up by 6.5% in the same period.[19] The share of VET students at ISCED 3 level increased at the EU level and in most Member States; exceptions to this were Lithuania, Slovenia, Germany, Latvia and MK. In the majority of European countries, the increases in enrolments for general programmes exceeded those for vocational programmes with the exception of Belgium, Romania and Iceland.[20] Only in Finland, Spain, Greece, Sweden and Norway there was a shift in enrolments away from general to vocational programmes (*see Figure II.2.2)*.

Figure II.2.2: Enrolment patterns at the upper secondary level in European countries
Annual change in enrolments at the upper secondary level (2000-2005)



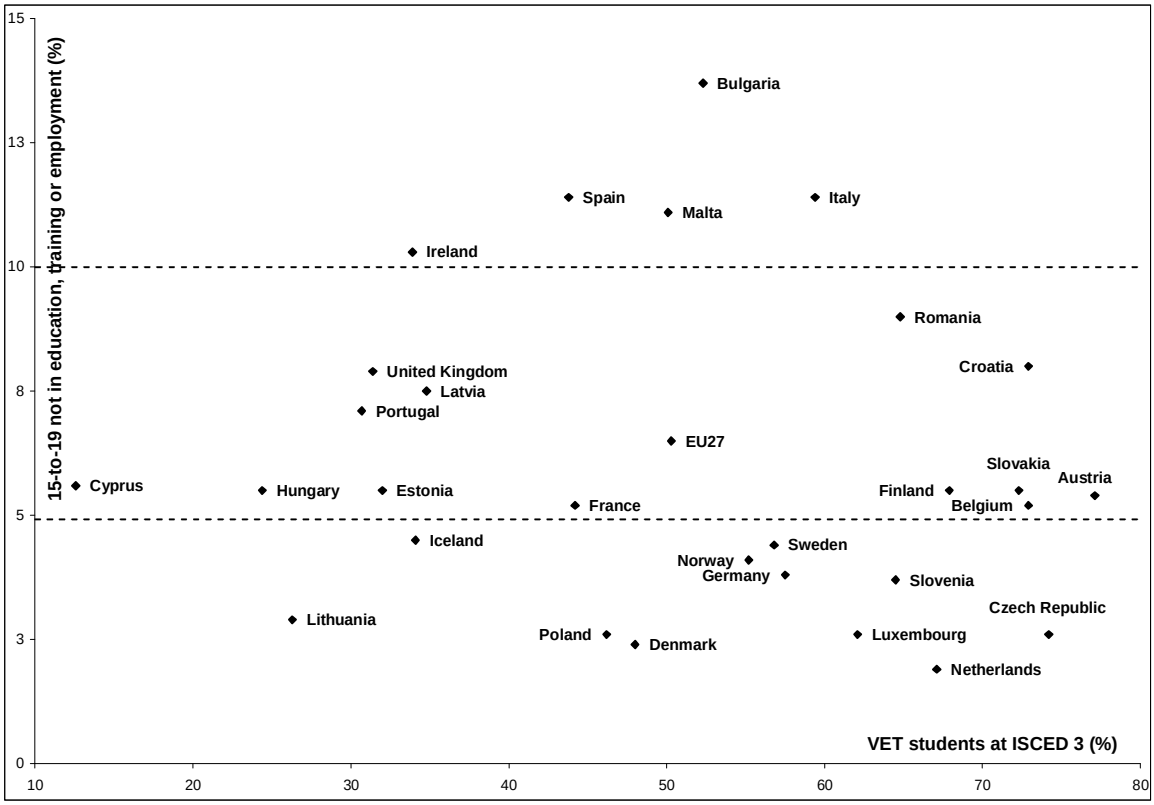
Source: DG Education and Culture - *Data source:* Eurostat (UOE)
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

The important contribution of VET to reducing early leaving from education and training has already been understood for some time[21] - countries with 50% or more students in ISCED 3 vocational programmes show lower values of early leavers from education and training[22]. While the evidence is far from clear cut, a similar positive impact can be seen when looking at the proportion of youths who are not employed nor participating in education and training (*NEET*). Less than 5% of *NEETs* aged 15 to 19 can be observed in countries with high prevalence of vocational programmes in upper secondary education (*see figure II.2.3*). Ten member states (Belgium, Czech Republic, Luxembourg, Germany, the Netherlands, Austria, Slovenia, Slovakia, Sweden, Finland) and Norway - where more than 50% of the students are enrolled in vocational programmes at ISCED level 3 - are also among the European countries with the lowest proportion of *NEETs* (below 5.5%); Denmark and Poland (with close to 50% VET students) can also be included in this group.

[19] Data from 2006 onwards are not comparable with previous years as some changes in the coverage of vocational programmes in the UK and France have had a sizeable impact on the EU aggregates.
[20] Several countries have recently reclassified vocational programmes at ISCED level 3, these modifications working to the detriment of national time series analysis as it is difficult to reassign enrolments for previous years. These countries are not included in the chart.
[21] European Commission (2004), *Achieving the Lisbon goal: The contribution of VET*, Cedefop (2004), *Vocational Education and Training - key to the future*.
[22] Persons aged 18 to 24 with at most lower secondary education and not having received any education or training in the four weeks preceding the survey.

Such findings suggest that well-developed vocational programmes can help to make educational systems more socially inclusive in their impact and to reach the Europe 2020 goal of reducing early leavers from education and training.

Figure II.2.3: Proportion of youths (15-19 year olds) neither in employment nor in education and training in European countries (2008)



Source: DG Education and Culture, *Data source:* Eurostat (UOE and LFS)

2.2. Participation of adults in job-related training

The latest available data from CVTS3 - the third continuing vocational training survey[23] - show an EU average participation rate of 33% in 2005 (the percentage of employees participating in CVT courses). Participation varied from 14% in Greece and 15% in Bulgaria, Latvia and Lithuania to 59% in the Czech Republic. Most Central and Eastern European Member States as well as Spain and Portugal had witnessed sizeable increases in participation rate between 1999 and 2005. However, the average participation rate[24] dropped by 5 percentage points in the same period and the decrease was over 10 points in some Nordic countries (Denmark, Sweden, United Kingdom and Norway). Training duration has followed same tendency as participation, increasing in nearly all new member states. The Czech Republic, Luxembourg, France, Slovenia and Sweden were the most training intensive countries, with participation rates above 45% and at least 13 hours annually per employee. At the other end of scale, the less intensive member states are Latvia, Bulgaria, Lithuania, Hungary, Romania and Greece.

New data coming from the Adult Education Survey (2007) can complement the analyses on patterns of adult participation in job-related training. The best performers are the Scandinavian countries (Sweden, Norway, Finland), each showing participation rates above 40% in job-related non-formal education. For another group of countries (Germany, Netherlands, Slovakia, Austria and United Kingdom), more than one-third of adults have

[23] CVTS is an employer survey of enterprises with 10 or more employees conducted by Eurostat in the European Union member states and Norway. Three rounds of the survey were carried out so far and data is available for the reference years: 1993, 1999 and 2005. The survey is based on common specifications with large sample sizes. Continuing Vocational Training (CVT) is defined as training measures and activities, which the enterprise finances, partially or entirely, for their employees who have a working contract. 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 CVTS the courses are events designed solely for the purpose of providing training or vocational education which should take place in a training centre located away from the workplace where participants receive instruction from teachers/tutors/lecturers for a period of time specified in advance. 'Other forms of CVT' include planned periods of training, instruction or practical experience, job rotation, exchange with other enterprises, selflearning, workshops, seminars, etc. CVT courses could be designed and/or managed internally (i.e. by the enterprise itself even if they are held in a location away from the enterprise) or externally (i.e. by an organisation which is not part of the enterprise even if they are held in the enterprise).

[24] Comparable averages between the two rounds of CVTS (1999 and 2005) are available only for 25 European countries.

participated in at least one job-related activity in the past 12 months, which is above the average for all participating countries. AES data also indicates that a large majority of training (43%) is in fact job-related and that the employers are the leading providers with a 40% share.

2.3. VET graduates: transition to the labour market

As stated in the Bruges Communiqué[25], initial VET must equip young learners with skills directly relevant to evolving labour markets and has a particular role to play in addressing Europe's high youth unemployment. While it is widely recognised that vocational education systems have proven quite successful in giving young people a good start in the labour market, data do not allow to comprehensively test the labour market success of young people who have completed vocational training relative to their peers who pass through the general stream.

Recent evidence from CRELL based on EU-SILC micro-data[26] suggests that vocational training helps to boost the well-known earnings pay-off which accrues to people who have finished upper secondary education over those who left school early. Across the 24 EU countries studied, there is universally an earnings gain, which persists throughout the working life, for those who complete upper secondary education over those who do not. The countries where this earnings differential is highest are those such as Austria, Germany, Slovenia, the Czech Republic, Slovakia, the Netherlands and Luxembourg where over 60% of the upper secondary students follow a vocational programme

3. Higher Education

Higher education is crucial to Europe's ambitions to be a world leader in the global knowledge economy. The Europe 2020 Strategy aims to support the further modernisation of European higher education systems, to allow higher education institutions to reach their full potential as drivers of human capital development and innovation. In order to respond to the demands of a modern knowledge-based economy, Europe needs more highly skilled higher education graduates, equipped not only with specific subject knowledge, but also the types of cross-cutting skills – such as communication, flexibility and entrepreneurial spirit – that will allow them to succeed in today's labour market. At the same time, higher education institutions must be able to play their full part in the so-called "knowledge triangle", in which education, research and innovation interact.

Europe 2020 has established the headline target that 40% of 30-34 year olds should have tertiary education qualifications by 2020. Closely linked to this is the headline target that Europe should spend 3% of GDP on research. Other EU-level objectives for higher education include the education benchmark for 2010 to increase the number of mathematics, science and technology graduates by at least 15% over 2000 level and the Bologna process objective that, by 2020, 20% of all university graduates should have undertaken learning mobility as part of their university education. When it comes to funding, the European Commission has proposed an objective that 2% of GDP should be spent on higher education.

The first section of this sub-chapter examines progress in the European modernisation agenda in higher education and the related inter-governmental Bologna Process to create a European Higher Education Area. The following section focuses on quality in higher education institutions and the remaining sections look at progress in participation in higher education by analysing growth in the number of students and graduates.

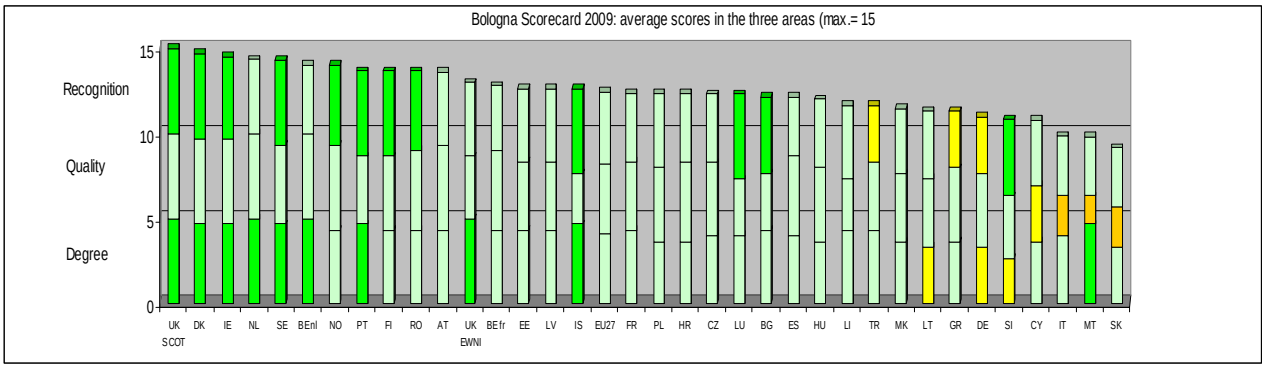
3.1 The Modernisation Agenda for Higher Education and the Bologna Process

The European Commission presented an over-arching strategy for European higher education in its 'Modernisation Agenda for universities: education, research and innovation' Communication of 2006. The Modernisation Agenda sets out three core priorities: curriculum, governance and funding reform. The issue of degree structure and curriculum reform was established as a key priority with the intergovernmental Bologna Process. Launched with the signature of the Bologna Declaration in 1999, the Bologna Process aims to create a European Higher Education Area, in which national higher education systems are more coherent and compatible. 47 European countries now participate in the Process, which has expanded in scope and geographical coverage over the years since 1999. On 28-29 April 2009, Ministers responsible for higher education met in Leuven/Louvain-la-Neuve to establish the priorities for European Higher Education until 2020. The importance of lifelong learning, widening access and mobility were underlined. The goal was set that by 2020 at least 20% of those graduating in the European Higher Education Area should have had a study or training period abroad. The Ministerial Anniversary conference, held in March 2010, confirmed the priorities set the year before but acknowledged that some of the Bologna aims and reforms have not been fully implemented and explained and that an increased dialogue with students and staff is necessary. Ministers committed to step up efforts to accomplish the reforms to enable students and staff to be mobile, to improve teaching and learning in higher education institutions, to enhance graduate employability, and to provide quality higher education for all.

[25] Ibid.
[26] CRELL (2010), *Returns to Education in European countries: Evidence from the European Community Statistics on Income and Living Conditions (EU-SILC)*.

A *Bologna Process Stocktaking Report 2009* was produced for the ministerial meeting in April 2009. For each Bologna country the report has a scorecard showing performance in 10 indicators on a scale from dark green (best performance) to red. The figure II.3.1 shows the performance of EU, Candidate and EFTA-EEA countries according to these scorecards. An average score is indicated (dark green=5 score points, light green =4, yellow = 3, orange = 2, red = 1). EU Member States in general perform well as regards the implementation of the 2 cycles (Bachelor, Master), except for Germany and Slovenia.

Figure II.3.1: Bologna scorecards 2009, Cumulative scores for degree system, quality , recognition



Source: DG EAC, *Data source:* Bologna Stocktaking report 2009

Implementation of the access to the next cycle is very good, while many countries still lag behind when it comes to the implementation of the Bologna requirement to implement a national qualifications framework (see Figure II.3.1).

As regards quality assurance, progress is on average good. 6 countries have the highest scores possible (Belgium-nl, Denmark, Ireland, Netherlands, Austria, UK-Scotland), while Malta, Italy and Slovakia still lag behind. When it comes to recognition of qualifications, EU countries score high on average although in five countries there is slow progress in the implementation of the principles of the Lisbon Recognition Convention (Belgium, Greece, Germany, Italy, Spain) and another 5 EU Member States (Cyprus, Czech Republic, Greece, Lithuania, Slovakia) have made slow progress in the recognition of prior learning.

Overall best performers in the 10 scorecard indicators are the UK-Scotland (5.0 on average), Denmark (4.9), Ireland (4.8), the Netherlands (4.7) and Belgium (Flemish Community, 4.6). The lowest performer in the EU is Slovakia (2.9), followed by Malta (3.3) and Italy (3.3).

The assessment showed that in 2009 not all Bologna goals had yet been reached by all participating countries. In the Leuven/Louvain-la-Neuve Communiqué of April 2009 the ministers responsible for higher education therefore declared that the objectives set out by the Bologna Declaration were still valid today and that the full and proper implementation of the objectives at European, national and institutional level would require increased momentum and commitment beyond 2010 (Leuven Communiqué, April 2009, page 2). In the Vienna/Budapest Communiqué of March 2010, Ministers committed to the full and proper implementation, in close cooperation with higher education institutions, staff, students and other stakeholders, of the agreed objectives of the Leuven/Louvain-la-Neuve Communiqué

3.2 Current International University Rankings

There are currently three worldwide university rankings initiatives regularly published and subject to much public debate: the Academic Ranking of World Universities (ARWU) from Shanghai's Jiao Tong University, the World University Ranking from the Times Higher Education (THE) and since addition the QS World University Ranking (in previous years QS prepared the Times ranking).

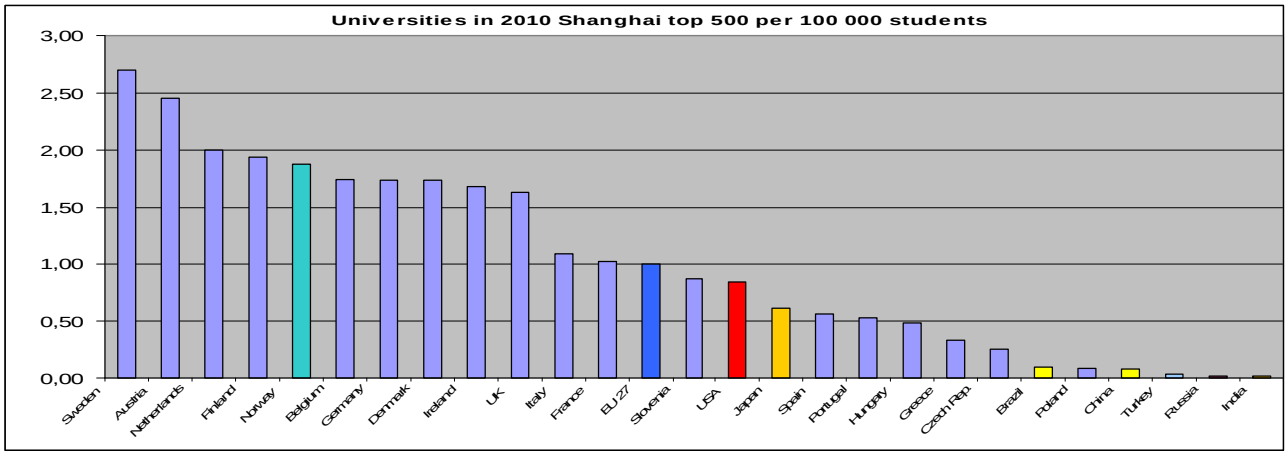
In the "Shanghai" ranking institutions are ranked according to six criteria mainly related to their scientific production. [27] The "THE" ranking on the other hand applies criteria covering the international dimension of staff and students, teachers to student ratios and peer reviews.[28]

In 2010, according to the "Shanghai" ranking, the EU-27 counted 191 among the top 500 universities included in the survey, while the United States counted 154 and Japan 25. Europe and US's shares have remained broadly

[27] See the annex for a more detailed presentation of the weights and indicators.
[28] The six THE indicators for ranking of universities are: International staff, international students, citation per faculty, teachers to student ratio, recruiter review, academic review

stable, with Japan giving way to new entrants, notably from China. Germany and the United Kingdom had the highest number of top institutions in Europe (respectively 39 and 38). Out of the Central and Eastern European Member States only Poland, Hungary, the Czech Republic and Slovenia had universities in the top 500. Considering the number of national institutions represented, the Netherlands, has 12 of its 13 comprehensive universities on the list of the Worlds top 500 universities. Also Sweden (11 out of 17) and Denmark (4 out of 9) perform relatively well. Europe has a solid base of medium to good quality universities and a higher share of its 4 000 higher education institutions (which include around 700 universities[29]) in the top 500 than the USA with its almost 4 350 higher education institutions. This picture is confirmed if the number of universities in the top 500 is related to the number of tertiary students (See Figure II.3.2.)

Figure II.3.2: Universities in Shanghai Top 500 list (2010) per 100 000 tertiary students



Source: DG EAC, data source: ARWU, Shanghai Jiao Tong University

In the EU in 2010 there was 1 higher education institution per 100 000 students in the top 500 World list of the Shanghai ranking.
The figure for the US is 0.84. 12 Member States have higher ratios in this respect compared to the US average. and in the case of the Netherlands, Austria, Finland and Sweden. the mentioned ratio is more two times or more higher than, the US (more than 2.0 higher education institutions in the top 500, per 100.000 students).

However, if only the top 200 or top 100 universities are considered, the performance of the European higher education system continues to lag behind the United States. Out of the top 100 universities, 54 are located in the United States and only 28 in the EU.

The USA leads especially in terms of institutions at the very top: it has 17 of the "Shanghai" top 20 universities. The EU has only two institutions in the top 20: Cambridge, ranked fourth, and Oxford, ranked tenth; Japan one (Tokyo University, ranked 19th).[30]

However, existing rankings, such as the Academic Ranking of World Universities (ARWU) from Shanghai's Jiao Tong University and the World University Ranking from the Times Higher Education (THE) have clear limitations, as they focus on research performance only and do not cover the full diversity of university types and their missions. The Commission believes that rankings should not only cover research performance, but also other missions which are of interest to different stakeholders, in particular students. For this reason the European Commission has funded a project, which has developed a model for classifying European higher education institutions on the basis of a variety of profiles and missions (not only research, but also teaching quality, regional engagement, internationalisation, innovation). This model allows for a useful *comparison of similar institutions with similar missions*. [31] The Commission has furthermore launched in May 2009 a feasibility study to develop a global multi-dimensional university ranking, based on this classification model, which will allow for *comparing performances of similar institutions*. This feasibility project will not result in a single overall listing of universities (no league tables). Rather, users will be able to make a "personalised ranking", based on the dimensions and underlying indicators they prioritise. The feasibility testing takes place on a sample of 150 higher education institutions within and outside Europe. The final report will be ready by June 2011 and will include recommendations on how such a ranking system could be implemented on a European and global level.[32]

[29] Defined here as full members of the European University Association (EUA), i.e. institutions that awarded at least one doctorate in the three years prior to becoming a member of the EUA.
[30] The ARWU ranking by broad subject field (see Annex table 2.2) reveals that in 2008, in medicine and natural sciences the EU takes similar shares of the top 100 or so institutions, but its share is lower in engineering and social science.
[31] See www.u-map.eu
[32] See www.u-multirank.eu

3.3 Investment in higher education

The economic crisis, which has resulted in sometimes drastic cuts in higher education budgets, has had an impact of many higher education systems. The full extent of effects still remains to be seen, which will make further monitoring and analysis important. Whilst no specific target for investment has been agreed at European level, the European Commission has repeatedly stressed that in order to fulfil their potential, universities and other higher-education institutions need to be adequately funded, and at least 2% of Gross Domestic Product (GDP) should be invested in a modernised higher education sector, public and private sources combined. Current levels of investment are substantially below this level: 1.2%, for the EU as a whole, of which public investment accounts for by far the largest part, about 1.12% of GDP (due to data lag these figures do not take into account recent cuts in budgets). Levels of investment in higher education vary significantly between Member States, for example, in Denmark, public spending on higher education already surpasses 2% of GDP ; a large share of this, however (as in Finland and Sweden) is direct financial aid to students and direct public spending on higher education institutions in these countries is hence considerably lower. Seven EU countries have a share of direct public spending below 1%, including Italy, Spain and Romania.

Figure II.3.3: Public spending on tertiary education as a percentage of GDP

Country	Public		Of which direct public spending	Of which on R&D In % of direct spending
	2001	2007	2007	2007
EU-27	1.08	**1.12**	0.88	:
Belgium	1.34	1.31	1.12	31.23
Bulgaria	0.82	0.68	0.62	3.16
Czech Republic	0.79	1.07	1.03	19.18
Denmark	2.71	2.29	1.65	:
Germany	1.10	1.14	0.89	36.99
Estonia	1.03	1.07	0.93	:
Ireland	1.22	1.14	0.98	:
Greece	1.07	:	1.42 (05)	15.1 (05)
Spain	0.97	0.99	0.91	36.90
France	1.21	1.23	1.14	33.82
Italy	0.80	0.76	0.61	55.34
Cyprus	1.14	1.61	0.66	21.31
Latvia	0.89	0.93	0.88	24.92
Lithuania	1.33	1.01	0.87	30.25
Luxembourg	:	:	:	:
Hungary	1.08	1.03	0.87	20.38
Malta	0.88	0.95	0.95	19.42
Netherlands	1.36	1.45	1.05	40.17
Austria	1.37	1.50	1.14	34.93
Poland	1.04	0.93	0.92	20.92
Portugal	1.03	1.20	1.03	31.47
Romania	0.78	1.12	1.08	:
Slovenia	1.28	1.21	0.93	18.24
Slovakia	0.82	0.79	0.63	16.29
Finland	1.99	1.85	1.56	33.81
Sweden	2.00	1.77	1.32	44.89
UK	0.79	0.94	0.44	90.57
Croatia	:	0.81	0.78	7.83
Iceland	1.07	1.39	1.08	:
MK*	:	:	:	:
Turkey	0.87	0.91 (06)	0.76 (06)	:
Liechtenstein	:	0.19	0.17	12.50
Norway	1.84	2.16	1.21	37.81
United States	1.48	1.25	0.99	:
Japan	0.55	0.63	0.48	:

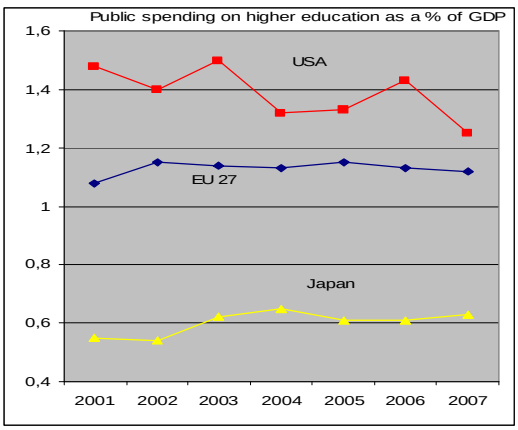
Source: Eurostat (UOE data collection). Spending on the tertiary level includes R&D spending at universities.
*MK: The former Yugoslav Republic of Macedonia; see Annex 2
Additional notes:
http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0,1136184,0_45572595&_dad=portal&_schema=PORTAL

Figure II.3.4: Private and total spending on tertiary education as a percentage of GDP

Country	Private payments to educational institutions	Household payments	Total private	Total private plus direct public
	2007	2007	2007	2007
EU-27	0.32	0.11	0.40	1.28
Belgium	0.12	0.16	0.28	1.40
Bulgaria	0.50	0.26	0.77	1.38
Czech Republic	0.20	0.04	0.23	1.26
Denmark	0.06	0.64	0.70	2.35
Germany	0.16	0.08	0.24	1.12
Estonia	0.28	:	0.28	1.21
Ireland	0.17	:	0.17	1.15
Greece	:	0.1 (05)	:	1.5 (05)
Spain	0.24	:	0.24	1.15
France	0.21	0.07	0.27	1.41
Italy	0.26	0.13	0.39	1.00
Cyprus	0.72	0.07	0.79	1.45
Latvia	0.46	0.21	0.67	1.55
Lithuania	0.43	0.04	0.47	1.34
Luxembourg	:	:	:	:
Hungary	0.3 (06)	:	0.3 (06)	1.1 (06)
Malta	0.00	:	:	1.1 (05)
Netherlands	0.40	0.06	0.47	1.52
Austria	0.19	:	0.19	1.34
Poland	0.37	0.05	0.42	1.34
Portugal	0.44	:	0.44	1.47
Romania	0.53	:	0.53	1.60
Slovenia	0.28	:	0.28	1.21
Slovakia	0.20	0.23	0.42	1.05
Finland	0.07	:	0.07	1.63
Sweden	0.16	:	0.16	1.48
UK	0.78	0.15	0.93	1.37
Croatia	0.32	:	0.32	1.10
Iceland	0.11	:	0.11	1.18
MK*	:	:	:	0.4 (03)
Turkey	:	:	:	0.8 (06)
Norway	0.04	:	:	1.25
United States	2.13	:	2.13	3.12
Japan	0.99	0.04	1.03	1.51

Source: Eurostat (UOE)
Additional notes:
ISCED 5-6: tertiary education.
Direct public expenditure does not include transfers to private entities. If public and private spending are added up, it is preferable to use direct public expenditure (instead of total expenditure) to avoid double-counting.
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Figure II.3.5: Public spending on tertiary education as a percentage of GDP



Data source: Eurostat (UOE)

While public investment in tertiary-level education in the EU is only slightly below the level in the USA, it is nearly twice as high as in Japan (Figure Int 4.4). However, private investment in higher education is much higher in both the USA and Japan. As a result, total investment in higher education institutions in the EU (for all activities, including both education and research) was in 2007, 1.3% of GDP, well below the level in the USA (3.1%) and also lower than in Japan (1.5%), Russia (1.7%), and Korea (2.4%), but higher than in Brazil (0.8%), China (0.5%, 2006) and India (0.4%, 2006).

The higher education investment gap between the EU and the USA thus amounted in 2007 to approximately 1.7% of GDP (about 200 billion Euro) or over 10 000 Euro per student[33] . Whilst more recent figures are not yet available, it is clear that in the wake of the economic crisis there has been increased pressure on the public purse which has resulted in substantial budget cuts to higher education in several EU member states. Furthermore, many US universities have substantial endowments funds which have sharply reduced in value as a result of the crisis.

When looking at the longer term trend, compared to 2001, total public expenditure on higher education as a percentage of GDP in 2007 increased in only 6 EU countries while it fell in 10 (it remained broadly at the same level in 9 countries). The most significant budget increases in that period have been observed in Czech Republic, Cyprus and Romania. However, recent trends seem to be less positive for these countries.

The balance between public and private funding of Higher Education varies substantially between countries: Bulgaria, Cyprus Latvia and Romania are the EU-27 countries with the lowest share of public funding, where more than one third of total investment in higher education institutions is from private sources (primarily tuition fees). Conversely, in Denmark, Greece, Malta and Finland higher education institutions are almost entirely funded by public resources.

There are also significant differences between EU member states as regards the share of public spending on higher education dedicated to research and development. Those Member States with high overall levels of R&D spending also have high shares of R&D investment when compared with total higher education investment. The 'large' Member States and the Nordic countries often show R&D shares of above 30% (Figure Int 4.1).

3.4 Graduates in higher education

The knowledge-based society on which the EU bases its hope for future prosperity and social cohesion requires a considerable supply of highly skilled people. High private returns to tertiary education - evidenced by relatively high wage levels and low unemployment rates for tertiary graduates as a whole - demonstrate that there is strong demand for tertiary graduates. Demand is particularly strong for graduates in science and engineering, but also in other fields like languages and economics[34].

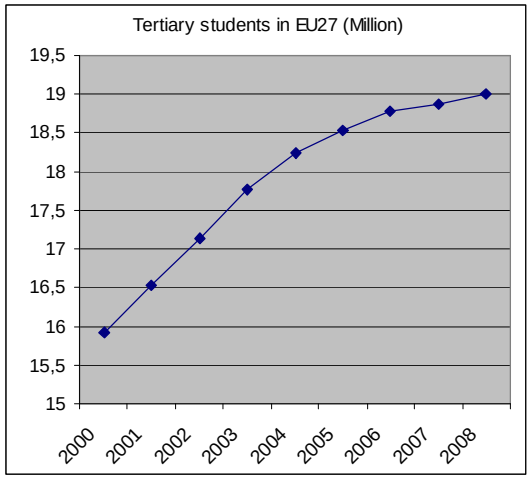
General student population trends

In 2008 about 32 million people in the EU (49% female and 51% male) were between 20 and 24 years old, the typical tertiary student age bracket. The "student-age" cohort has declined slightly in recent years (-1.8% between 2000 and 2008), with large differences in trends between Member States. Despite this slight decline in the number of young people in the EU, an increase in the tertiary education participation rate coupled with an increased number of students from outside Europe studying in the EU (currently about 0.8 million) led to a growth of 19.3% (Figure II.3.6) in the number of tertiary students in the EU over the period 2000-2008. This corresponds to an average annual growth rate of 2.2%. Growth tailed off in 2006 and 2007 but accelerated again in 2008. Anecdotal evidence would suggest that the economic downturn may have boosted numbers further in 2009. Compared to 2008, the number of tertiary students increased by 3.9% in the UK, by 4.3% in Germany and by 3.7% in France in the academic year 2009/10.

[33] per full time equivalent student the gap even amounted to nearly 13 000 Euro PPS, 21540 in the US and 8590 in the EU

[34] Whilst analysing available Eurostat statistics on graduates, it should be noted that the total number of graduates and the growth rates double count graduates at various degree levels. Since both first, second and third degrees are included (the second degrees currently account for about 20% of graduates, new PhDs for 2%), the data on graduates cover the total number of graduates during the year concerned, not the number of first-time graduates.

Figure II.3.6: Total number of tertiary students in the EU 27 (2000-2008)



Source: Eurostat (UOE)

Figure II.3.7: Tertiary students by country (2000-2008)

	Number of tertiary students (in 1000)			Growth per year
	2000	2007	2008	2000-08
EU-27	**15920**	18879	19003	2,5
Belgium	356	394	402	1.5
Bulgaria	261	259	265	0.1
Czech Republic	254	363	393	5.6
Denmark	189	232	231	2.5
Germany	2055	2279	2245	1.1
Estonia	53.6	68.8	68.2	3.0
Ireland	161	190	179	1.3
Greece	422	603	600	2.5
Spain	1829	1778	1781	-0.3
France	2015	2180	2165	0.9
Italy	1770	2034	2014	1.6
Cyprus	10.4	22.2	25.7	11.9
Latvia	91	130	128	4.3
Lithuania	122	200	205	6.7
Luxembourg	2.4	2.7	3.0	2.7
Hungary	307	432	414	3.9
Malta	6.3	9,8	9.5	5.2
Netherlands	488	583	602	2.7
Austria	290	261	285	-0.2
Poland	1580	2147	2166	4.0
Portugal	374	367	377	0.1
Romania	453	928	1057	11.2
Slovenia	84	116	115	4.1
Slovakia	136	218	230	6.8
Finland	270	309	310	1.7
Sweden	347	414	407	2.0
United Kingdom	2024	2363	2330	1.8
Croatia	:	140	143	3.3
Iceland	9.7	15.8	16.6	7.0
MK*	36.9	58.2	65.5	7.4
Turkey	1015	2454	2533	12.1
Liechtenstein	0.5	0.7	0.8	12.7
Norway	191	215	213	1.4

Source: Eurostat (UOE)
Number of students = total number of full-time and part-time students.
DE, SI: data exclude ISCED level 6. 2000: RO: Data exclude ISCED level 6; MK: Data exclude ISCED level 5A second degrees and ISCED level 6; BE: Data exclude independent private institutions and German-speaking community; CY, LU, LI: most students study abroad and are therefore not included. MT, UK: growth for 2000-2005
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Higher education graduates

Since 2000, the total number of tertiary graduates in the EU 27 has increased by 35%, or 4.5% per year: nearly twice as fast as the tertiary student population. One of the reasons for this was the Bologna process with more students taking several degrees and hence being counted several times as graduates. Given the decline in the population cohort most likely to participate in tertiary education, this has led to a 37% increase in the number of tertiary graduates per 1000 young people aged 20-29.[35]

Figure II.3.8: Tertiary graduates (2000-2008)

	Number of tertiary graduates (in 1000)			Growth per year
	2000	2007	2008	2000-08
EU-27	**2873**	**3865**	**4079**	**4.5**
Belgium	68.2	104.0	97.2	4.5
Bulgaria	46.7	49.2	54.9	2.0
Czech Republic	38.4	77.6	89.0	11.1
Denmark	39.0	50.8	49.8	3.1
Germany	302.1	376.9	398.5	3.5
Estonia	7.7	12.6	11.3	5.0
Ireland	42.0	59.0	60.1	4.6
Greece	:	60.5	67.0	1.4
Spain	260.2	279.4	291.0	1.4
France	508.2	622.9	621.4	2.5
Italy	202.3	256.4	235.7	1.9
Cyprus	2.8	4.4	4.2	5.3
Latvia	15.3	26.8	24.2	5.9
Lithuania	25.2	43.2	42.5	6.8
Luxembourg	:	:	0.3	1.5
Hungary	59.9	67.2	63.3	0.7
Malta	2.0	2.7	2.8	4.3
Netherlands	76.9	96.0	92.5	1.9
Austria	25.0	36.4	43.6	7.2
Poland	350.0	532.8	558.0	6.0
Portugal	54.3	83.3	84.0	5.6
Romania	67.9	206.0	311.5	21.0
Slovenia	11.5	16.7	17.2	5.2
Slovakia	22.7	46.4	65.0	14.1
Finland	36.1	42.3	57.1	5.9
Sweden	42.4	60.2	60.4	4.5
United Kingdom	504.1	651.1	676.2	3.7
Croatia	:	22.2	26.9	:
Iceland	1.8	3.5	3.6	11.2
MK*	3.9	8.7	11.2	8.9
Turkey	190.1	416.3	444.8	11.9
Liechtenstein	:	0.15	0.18	:
Norway	29.9	35.4	35.2	1.9

Source: Eurostat (UOE),
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Growth was particularly strong (at more than 10% per year) in Romania, the Czech Republic and Slovakia, where the number of students expanded strongly around from 2000 onwards.

However, in 2008 growth in the number of tertiary graduates decelerated. In some countries, there was even a slight decline in the number of graduates compared to the year before. The number of graduates declined in several Member States, including Belgium, Italy and France. Anecdotal evidence would suggest that the numbers of graduates are likely to recover, at least in the short run, in the wake of the economic downturn.

The comparison with other countries also shows a strong growth between 2000-2008 in graduates in emerging economies, such as China and Brazil. This is a result of a strong growth in the tertiary student population and of growing participation rates.

[35] One of the reasons for this is the Bologna Process with a higher share of students taking second degrees. In the field of MST for example, the number of second degree graduates from academic programmes (ISCED 5A) has more than doubled since 2000 to reach about 154 000 in 2007, while the number of first degrees in this period grew only by 23%.

Figure II.3.9: Tertiary graduates in Third countries

	Students (1000)		Graduates (1000)		Growth per year, %
	2000	2008	2000	2008	2000-08
Belarus	460	576	77.6	112.9	4.8
Moldova	104	144	16.9	27.1	6.1
Russia	8020	9 446	1190.6	*1191.5*	*7.6*
Ukraine	2130	2 848	424.6	610.2	4.6
Armenia	63	107 07	11.4	*16.0*	*5.0*
Azerbaijan	117	142	24.8	32.2	3.3
Georgia	137	130	21.4	55.4	12.6
Algeria	549 01	902 07	:	*120.2*	:
Morocco	276	401	27.3	62.7	11.0
Tunisia	180	351	19.6	*56.6*	*16.4*
Libya	290	375 05	:	:	:
Egypt	2154 03	2 488	342.3	416.5	:
Lebanon	116	197	14.4	32.3	10.6
Palestine	71	181	11.6	25.3	10.2
Israel	256	325	62.4	*76.7*	*3.0*
Australia	845	1 118	168.9	295.9	7.3
Canada	1 221	1 327 05	225.1	:	:
Korea	2 838	3 204	493.0	605.3	2.6
India	9 404	14 863	:	:	:
China	7 364	26 692	1776	7071.0	18.9
Mexico	1 963	2 623	299.1	420.5	4.4
Brazil	2 781	5 958	348.0	917.1	12.9
USA	13202	18 248	2151.0	2782.3	3.3
Japan	3982	4033	1081.4	1033.8	-0.6
EU-27	15 920	19 003	2873.4	4078.7	5.4
World (Mio)	103	160	:	:	:

Data source: Eurostat, UNESCO, data on students: India 2007 instead of 2007; graduates: China: data for 2006 instead 2005 and ISCED 5A only, Ukraine, Armenia: 2001 instead 2000, Egypt 2002 instead of 2000, Canada: 1999 instead 2000, Algeria 2004 instead 2005,

The world tertiary student population has grown by a third since 2000, reaching about 160 million in 2008. Growth has been particularly strong in China, where the number of tertiary students has tripled since 2000 to reach 26.7 million in 2008 (in 1950 China had only 120 000 students). China now has more students than the EU or North America. The four BRIC countries (Brazil, Russia, China and India) together have more tertiary students than the EU, North America and Japan combined. Today, a majority of tertiary students worldwide study in developing and emerging countries.

As a result of strong growth in student numbers, China overtook the EU to become the world's leading producer of tertiary graduates in 2006. The US, Russia, Japan and probably India are other countries that produce more than 1 million graduates per year (Figure II.3.4).

Within Europe, countries that produce a high number of graduates per 1000 young people (> 80) include Lithuania and the UK; Germany, Italy, Cyprus and Austria produce relatively few (< 42/ 1000 young people). The number of ISCED 6 graduates (doctoral level) per 1000 young people aged 25-34 is relatively high (> 2.0) in Germany, Portugal, Austria, Finland, Sweden and the UK.

Figure II.3.10: Tertiary graduates by ISCED level, 2000-2008

	Number of tertiary graduates Per 1000 population aged 20-29/25-34			
	ISCED 5 and 6 (/population 20-29)		ISCED 6 only (/population 25-34)	
	2000	2008	2000	2008
EU-27	**43e**	**61.8**	**1.1**	**1.4**
Belgium	51.4	73.3	0.8	1,4
Bulgaria	38.1	50.7	0.3	0.5
Czech Republic	22.4	59.0	0.6	1.4
Denmark	54.0	79.8	1.0	1.6
Germany	31.0	40.5	2.1	2.6
Estonia	34.0	55.7	0.6	0.8
Ireland	70.4	80.0	0.9	1.4
Greece	:	44.9	:	0.8
Spain	39.5	45.2	0.9	0.9
France	64.3	76.6	1.2	1.4
Italy	24.8	35.1	0.4	1.5 (07)
Cyprus	28.6	31.9	0.1	0.2
Latvia	46.7	69.2	0.1	0.4
Lithuania	51.8	84.5	0.9	0.8
Luxembourg	12.1	5.5	:	0.1
Hungary	37.5	44.9	0.5	0.7
Malta	36.9	46.6	0.1	0.2
Netherlands	36.1	47.0	1.0	1.6
Austria	24.1	41.2	1.4	2.0
Poland	58.1	87.6	:	0.9
Portugal	30.5	58.8	1.6	3.0
Romania	19.4	92.1	:	0.9
Slovenia	39.0	60.7	1.0	1.3
Slovakia	25.4	72.2	0.6	1.8
Finland	56.3	86.2	2.7	3.0
Sweden	38.0	54.3	2.5	3.2
United Kingdom	66.4	82.4	1.3	2.1
Croatia	:	36.4	:	0.8
Iceland	42.7	77.1	0.0	0.5
MK*	12.2	26.8	0.1	0.3
Turkey	14.7	:	0.2	0.3
Liechtenstein	:	33.2	:	:
Norway	48.9	61.7	1.0	2.0
USA	56.2	65.5	1.1	1.6
Japan	57.6	68.8	0.7	0.9

Data source: Eurostat (UOE),
*MK: The former Yugoslav Republic of Macedonia; see Annex 2,
PT: includes also ISCED 6 lower programmes

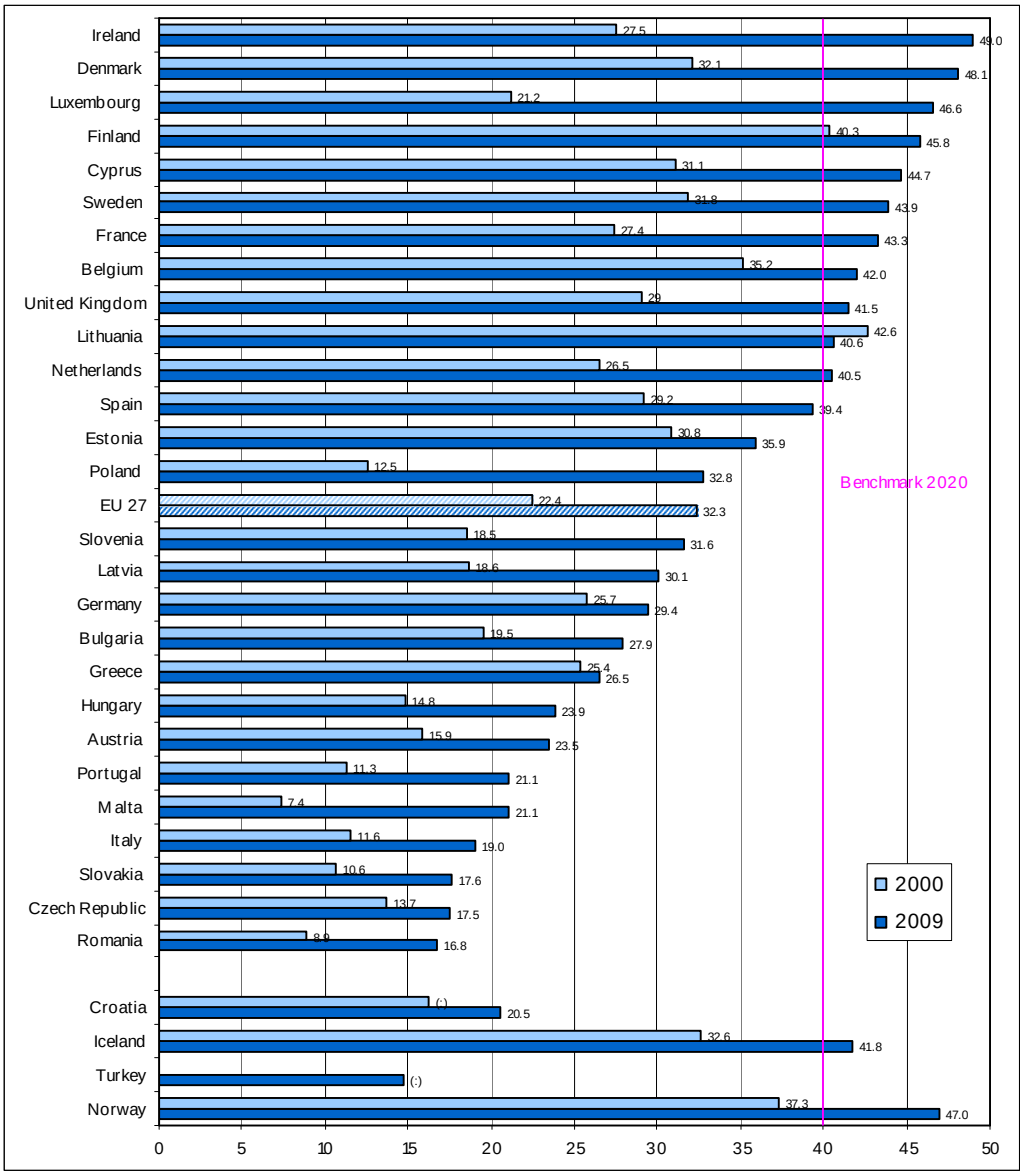
For more country specific notes see:
http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0,1136184,0_45572595&_dad=portal&_schema=PORTAL

3.5 Higher education attainment of the population: meeting the Europe 2020 headline target

As already discussed in section 2.3 and the Introduction (Figure 2.8)**,** the new Europe 2020 headline target for **tertiary attainment levels among the young adult population** foresees that by 2020 at least 40% of 30-34 year olds should hold a university degree or equivalent. In 2009, 32.3% of 30-34 year olds in the EU had tertiary attainment, compared to only 22.4% in 2000. The trend since 2000, shown in Figure 2.8, suggests it will be possible to reach the target level by 2020. However, Member States' targets, as set out in their first provisional National Reform Programmes, are by and large very cautious and would lead to a lower rate of progress and possibly failure to meet the target by 2020.

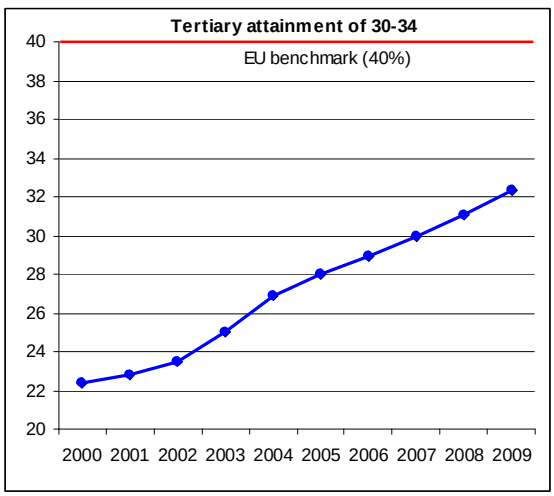
In 2009, eleven EU countries had already exceeded the 2020 target of 40%. Ireland, Denmark, Luxembourg and Finland show the highest tertiary attainment, with rates of over 45%. Southern European countries (with the exception of Spain) and Central European countries, despite the fact that they have very high secondary education completion rates, tend to lag behind. Progress in tertiary attainment rates in the period 2000-2009 was strongest in Luxembourg, Ireland and Poland (more than 20 percentage points increase).

Figure II.3.11: Share of 30-34 year olds with tertiary attainment, 2000 and 2009 (%)



Source: DG Education and Culture - *Data source:* Eurostat (LFS)
Note: Croatia: 2002 instead of 2000

Figure II.3.12: Tertiary attainment of 30-34 year olds, 2000-2009



Source: DG Education and Culture - *Data source:* Eurostat (LFS)

In addition to a substantial increase in tertiary attainment among their own citizens, Ireland and Luxembourg have also seen a net in-migration of young adults with high educational attainment in this period. The EU countries with the lowest tertiary attainment rates are Romania, the Czech Republic, Slovakia and Italy. The Czech Republic saw little improvement in its tertiary attainment rate in the period 2000-2007, but has made progress since 2008.

In 2008, about 32% of 25-34 year olds in the EU had a tertiary education qualification, compared to an average of 35% among OECD countries. In the US, tertiary attainment among young adults was 42% in 2008, some 10 percentage points higher than in the EU. The OECD countries with the highest tertiary attainment of young adults are Korea (58%), Canada (56%), and Japan (55%). Outside the OECD, Russia (55%) and Israel (42%) show high tertiary attainment levels. However, it should be noted that the comparability of data with the non-UE countries is not assured.

4. Education and employment – the role of education and training in a context of economic downturn

This section focuses on the role played by education and training, skills and knowledge in shaping the employability and labour market success of citizens. It looks at these questions in a context of economic downturn and a difficult labour market. Among the five headline targets set out in the Europe 2020 strategy, the first is « to bring to 75% the employment rate for women and men aged 20-64, including through the greater participation of youth, older workers and low skilled workers and the better integration of legal migrants » (European Council, 2010, p. 2). Ensuring that workers have the right skills to participate in the knowledge-based economy is furthermore deemed essential to respond to challenges such as global competition, demographic changes, sustainable development, etc. The central contribution of education and training systems to this objective, and the need for systems to take fuller account of employability and to adapt to changing skills needs is a core concern of the New Skills and Jobs flagship action under Europe 2020.

The current crisis has taken its toll on EU labour markets, reversing most of the employment growth achieved since 2000. Employment in the EU has shrunk by over 4 million jobs since the start of the crisis in 2008 (European Commission, 2009). The unemployment rate reached 9% in the last quarter of 2009 (and 9.6% in October 2010), despite some moderate signals of economic recovery appearing in some countries. Unemployment reached particularly high levels in the Baltic countries, Spain and Ireland. On the other hand, the increase in unemployment was relatively small in Belgium, Finland, Italy, Luxembourg, Malta, Poland, Sweden, and The Netherlands; and the unemployment rate declined in Germany (European Commission, 2010a).

The largest declines in employment in 2008 and 2009 occurred in the manufacturing and construction sectors while services (including financial) still registered slight positive growth (Eurostat, 2009a).

The economic crisis has highlighted the vulnerability of certain groups in the labour market, namely men, young people, the low-skilled and workers on temporary contracts (see European Commission, 2010b; OECD, 2010a). Recent Eurostat Statistics in Focus reports on “The impact of the crisis on employment” (Eurostat, 2009a, 2009b, 2010a and 2010b) underline that employees have been affected differently depending on their level of education, with a stronger impact on those with low educational attainments. By gender, low-skilled males were the ones experiencing the hardest job losses (for further details, cf. section on Labour Market Outcomes in the 2009 Report “Progress towards the Lisbon objectives in education and training – Indicators and benchmarks”, European Commission, 2009). The observed patterns of unemployment suggest that some reassignment to lower-skilled positions is taking place, meaning that some higher educated people are taking jobs formerly taken by people with lower educational attainment (Expert Group on New Skills for New Jobs, 2010).

A benchmark proposal has been requested by the Council on the role of education for employability (cf. Mandate in Council Conclusions of May 2009 on a Strategic Framework for European cooperation in Education and Training for the next decade (“ET 2020”).[36] This proposal is due for adoption by the Commission in Spring 2011.

Looking specifically at how education and training (E&T) may contribute to short-term and long-term recovery, this section is organized as follows: section 4.1 presents indicators on the relationship between educational attainment and labour market outcomes; section 4.2 presents indicators on the quantity and quality of the skill supply by E&T systems focusing on the levels of educational attainments, the duration of the transition from education to work, the evolution of private returns to education and the role played by skills mismatch on employability; and section 4.3 presents recent results on inferential relationships between E&T and unemployment.

[36] Cf. Discussion Note (CRELL, 2010b), In-Depth Analysis of Key Issues (CRELL, 2010c) and Methodological Note (CRELL, forthcoming) prepared for the Expert Group on the Employability Benchmark.

4.1. Educational attainment and labour market outcomes

Evidence shows that the quantity and, especially, quality of schooling, measured in terms of student performance on cognitive achievement tests yield substantial payoffs on the labour market for the individual and society alike (OECD, 2010b; Wößmann, 2002; Barro & Lee, 2001). Moreover, the education and training participation of adults can help to ensure that the workforce can be efficient and competitive across a longer lifespan. Participation in lifelong learning can combat skill obsolescence through continuous updating and upgrading of basic and specific skills to remain employable, work longer and make career changes. As demonstrated by the Expert Group on New Skills for New Jobs (2010) in its report *New Skills for New Jobs: Action Now*, improved skill levels have the potential not only to help workers 'get in' to work, but also to 'stay in' work and 'get on' (i.e. progress through the labour market into better jobs).

In fact, when exploring the relationship between educational attainment and employment rate, we can observe that higher levels of educational attainment are associated with higher employment rates (figure II.4.1 and II.4.2). In terms of the trend, figure II.4.1 reveals that while the overall EU 27 employment rate of the 20-64 year-olds had improved by 1.4 percentage points between 2004 and 2009), the employment rate for those with low educational attainment levels had decreased by as much as 1.3 percentage points, while the one for people with medium educational attainment increased by 1 percentage point and the one of people with high educational attainment remained stable. Hence, those with the lowest educational attainment constitute clearly the population at the highest risk in today's European labour markets.

Figure II.4.1: Changes in EU27 employment rates by educational attainment (20-64 year-old) between 2004 and 2009

Educational attainment	2004	2009	Change 2004-2009
Below upper secondary education	55.2	53.9	-1.3
Upper secondary and post-secondary non-tertiary education	69.2	70.2	1.0
Tertiary education	82.7	82.6	-0.1
Overall	**67.4**	**68.8**	**1.4**

Source: Eurostat (LFS)

Figure II.4.2 looks at the relative employment positions across Member States and confirms the general point that higher educational attainment levels imply higher employment rates. Nevertheless there is considerable difference between countries: employment rates of the 20-64 year-old population with low level of education differ significantly among EU countries, ranging from 30.7% in Slovakia to 68% in Portugal. The magnitude of the difference in employment between low educated and high educated also varies significantly across countries, ranging from 13.7percentage points in Portugal to 54.5 percentage points in Lithuania (to be compared with an overall 28.3 percentage points difference in EU27).

For people with medium levels of educational attainment the employment rate varies between 60% in Lithuania and 80.6% in Sweden while the employment rates of people with high educational attainment is above 80% in all countries except Estonia, Ireland, Greece, Spain, Italy, Hungary and Slovakia in each of which it lies between 70 and 80%.

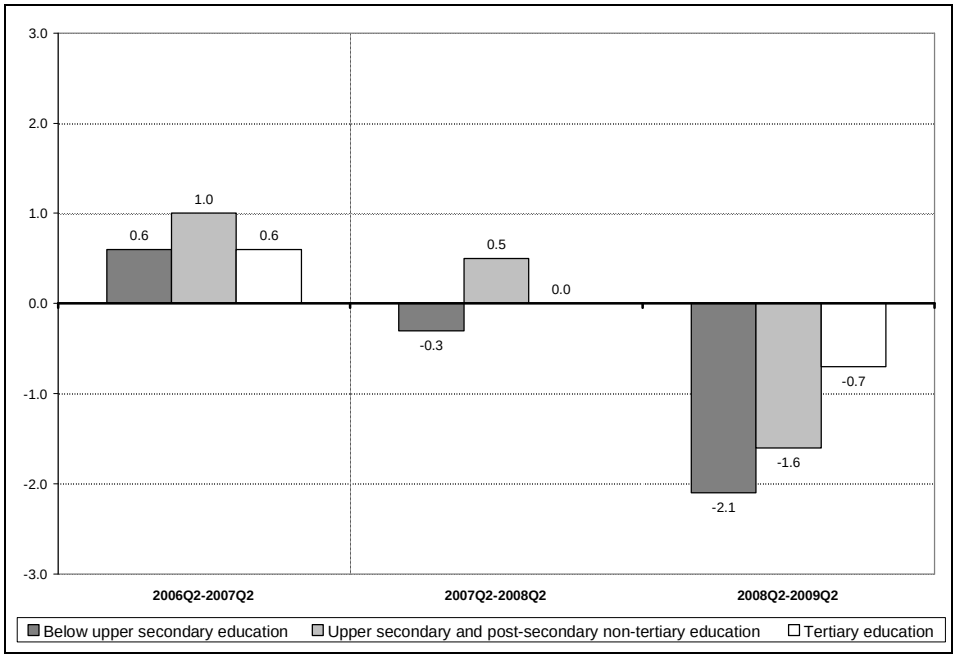
Figure II.4.3 presents a more detailed overview of the recent changes in employment year-by-year by level of education of the 20-64 year-olds. In the period 2006 second quarter (q2) to 2007 (q2) all educational attainment levels see positive employment rate changes. However, between 2007 (q2) and 2008 (q2), the first group to be affected by employment losses (negative annual change) was the low educated (i.e. those with less than upper secondary education), followed by the high educated whose employment rate stagnated during that period. The only group with a positive employment rate change during that period was the medium educated (ISCED 3-4) which maintained a 0.5 percentage point increase. Yet, between 2008 and 2009, despite a general loss in employment, the higher educated lost employment to a lesser extent than their lesser educated counterparts. Hence, overall, Figure II.4.3 reveals that the cohort that suffered the heaviest loss in employment during the crisis period is the low educated.

Figure II.4.2: Employment rates and educational attainment by country (20-64 year-old), in % (2010Q3)

	Below upper secondary education	Upper secondary education	Tertiary education
EU27	53.8	70.4	82.1
Belgium	48.2	69.5	81.8
Bulgaria	41.7	68.7	82.9
Czech Republic	42.5	71.6	80.8
Denmark	63.1	78.6	85.8
Germany	56.3	75.4	86.6
Estonia	44.5	66.8	78.1
Ireland	46.6	63.5	79.5
Greece	58.5	61.3	78.0
Spain	52.5	64.6	77.4
France	55.0	71.5	80.7
Italy	50.1	66.9	74.9
Cyprus	67.5	74.7	82.3
Latvia	49.0	63.6	81.3
Lithuania	30.9	60.0	85.5
Luxembourg	57.6	69.1	84.2
Hungary	38.2	62.8	77.2
Malta	51.4	77.2	82.5
Netherlands	61.8	79.6	86.7
Austria	56.8	77.8	84.7
Poland	41.4	63.6	82.3
Portugal	68.0	70.0	81.7
Romania	57.2	64.1	81.5
Slovenia	49.4	69.6	86.7
Slovakia	30.7	66.2	77.2
Finland	55.5	73.2	83.7
Sweden	63.6	80.6	87.8
United Kingdom	55.9	75.9	84.0
Croatia	42.4	59.0	75.7
Iceland	75.2	81.6	87.9
MK*	33.5	52.3	71.1
Turkey	46.3	54.9	69.8
Norway	64.8	79.0	89.6
Switzerland	70.7	80.7	87.2

Source: Eurostat (LFS)
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

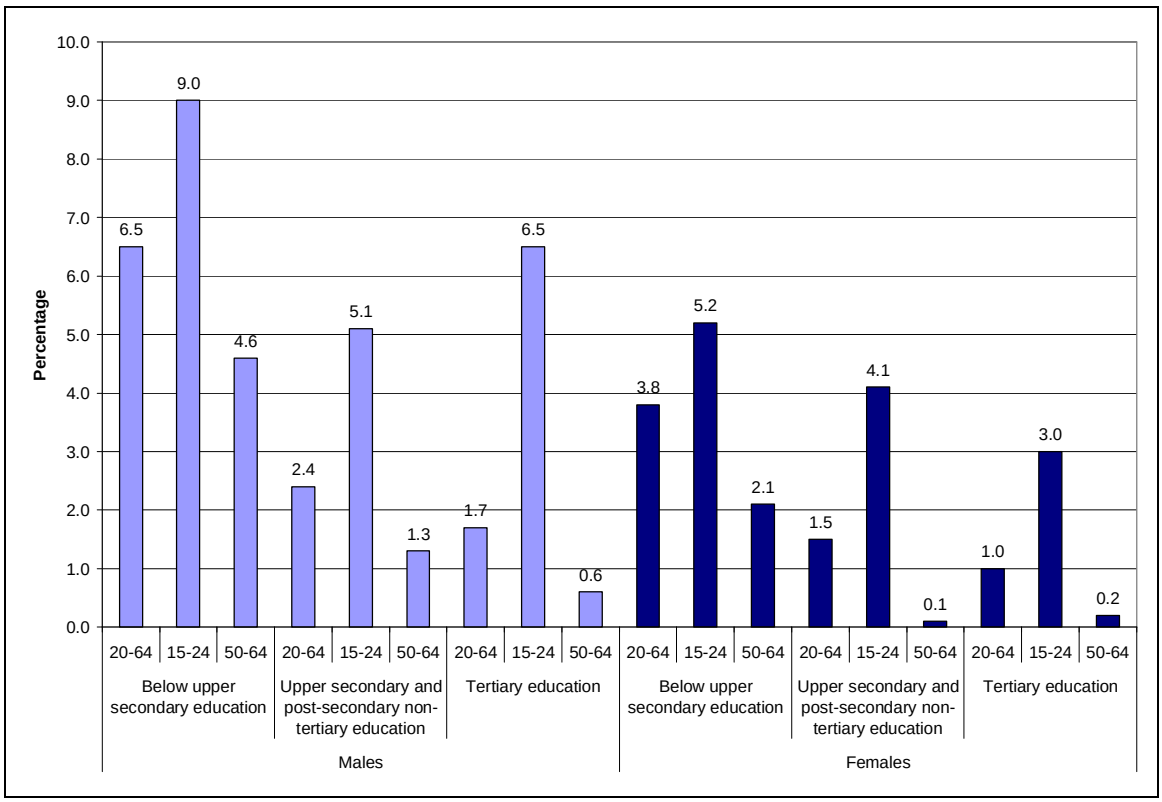
Figure II.4.3: Annual changes in employment rates (20-64 year-old) between 2006Q2 and 2009Q2, by educational attainment (in percentage points)



Source: Eurostat (LFS)

Figure II.4.4 adds a gender and aged dimension to the analysis of the effect of the crisis on employment for the different educational levels. In general men have been affected much more by the crisis than women, independently of their educational level. Older workers (50-64) are consistently, across educational levels, the group with the lowest unemployment change. It is worth noticing that the difference between employment performance for youth and older workers increases with the level of educational attainment. thus while low educated youth suffered twice as much unemployment increase as low educated older workers, the medium educated male youth suffered four times (41 times for women) as much as their older counterparts and the high educated male youth eight times (15 times for women) as much as their older counterpart.

Figure II.4.4: Percentage change in unemployment rates between 2007Q2 and 2010Q2, by gender, age group and highest level of education attained



Source: Eurostat (LFS)

The duration of the transition from education to employment provides an important indication of the dynamics and level of interaction of the E&T systems and the labour market. A short time interval between education and a first job suggests a good level of responsiveness of the E&T systems to labour market demands in terms of occupational profiles, provision of opportunities to combine workplace experience with education as well as efficient qualification frameworks (ex. EQF), effective career counselling and career guidance.

Figure annex II.4.1. reveals significant differences in the activity status of young graduates (aged 20-34) after first entry to the labour market according to their educational attainment and to the time elapsed since graduation. In 2009, while 70.6% of the low educated are in employment less than 1 year after graduation, the medium and high educated have employment rates of 83.1% and 84.3% respectively and suffer less from unemployment and inactivity immediately after their exit from formal education. These values remain stable across cohorts. The only exception is for the low educated cohort for which we observe a 10 percentage points increase in employment (from 70.2% to 80.1%), with a 48% decrease in inactivity and a 22% decrease in unemployment 5 years after graduation.

4.2. The availability and quality of knowledge and skills' supply

This section will focus on indicators related to the knowledge and skills' supply available in EU countries as well as their quality. As such it is strongly related to the policy agenda addressed under the New Skills and Jobs flagship action of the Europe 2020 strategy.

The level of educational attainment of the adult population (20-64) is used as a proxy for the availability of knowledge and skills.

Figure II.4.5: Change in educational attainment between 2004 and 2009 by age group, EU27, %

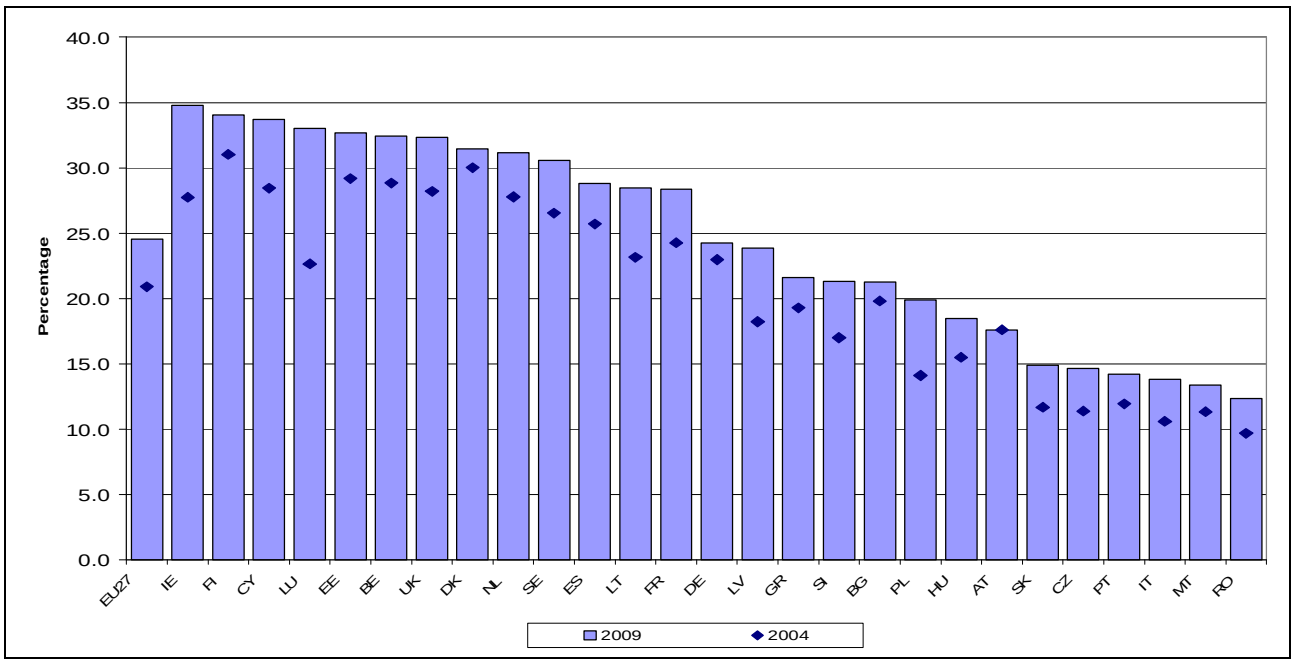
	20-64			20-24			25-54			55-64		
	2004	2009	Change	2004	2009	Change	2004	2009	Change	2004	2009	Change
Below upper secondary education	29.3	25.5	-3.8	22.9	21.4	-1.5	28.0	24.7	-3.4	45.8	39.6	-6.2
Upper secondary and post-secondary non-tertiary education	49.8	49.9	0.1	64.8	65.0	0.2	48.7	48.2	-0.4	38.0	41.8	3.8
Tertiary education	20.9	24.6	3.7	12.3	13.7	1.4	23.3	27.1	3.7	16.2	18.7	2.5

Source: Eurostat (LFS)

Figure II.4.5 shows that, overall (across all age groups) the level of knowledge and skills available on the labour market has shifted upwards. Nevertheless, despite a strong increase between 2004 and 2009 (+3.8 percentage points), the high skilled still constitute the minority of the adult population (less than 25%). When looking at the breakdown by age groups, we see that the larger changes between 2004 and 2009 can be observed for the older workers (55-64 year-olds) where the share of low educated decreased by 6.2 percentage points mainly in favour of medium educational levels (+3.8 percentage points) but also of high education attainments (+2.5 percentage points). The cohort that increased the most its high educational attainment share is the one aged 25-54 years old (+3.7 percentage points). Finally, the youngest cohort (20-24 year-olds) made a shift of only 1.4 percentage points from low education to high education. Thus the level of knowledge and skills available on the labour market has across all age groups shifted upwards. These changes in the distribution of educational attainment over time and by age group also reflect current demographic changes with a decrease of the young population and an increase of the older population.

As shown by Figure II.4.6, this increase of the share of high educated has been observed in all MS except Austria where the high educational attainment has remained constant. Luxembourg is the country in which the increase has been the strongest with +10.4 percentage points between 2004 and 2009.

Figure II.4.6: High educational attainment of the adult population (20-64 year-old) in 2004 and 2009, %



Source: Eurostat (LFS)

Nevertheless, despite this overall increase, when considering the high educational attainment of the 25-64 years old adult population in 2008, it is clear from Figure II.4.7 that the EU is still performing well below some key competitors. For instance, with 24% of the working age population having high educational attainment, the EU lies 25 percentage points below Canada (49%), 19 percentage points below Japan (43%), 17 percentage points below the USA (41%) and 12 percentage points below Australia (36%). While only the best performing EU countries manage to compete with Australia, the worse performing EU countries present high education attainment levels ranging between the ones of Brazil (11%) and Mexico (16%).

Figure II.4.7: High educational attainment (third countries) (25-64 years old) in 2008, %

	2008
EU27	**24**
Australia	36
Brazil	11
Canada	49
Japan	43
Korea	37
Mexico	16
New Zealand	40
Russian Federation	54
USA	41

Source: Eurostat (LFS) and OECD (EAG 2010, indicator A1.3a).
Note: Year of reference 2008 for all countries, except for the Russian Federation (2002).

When looking at educational attainment levels by gender (Figure II.4.8), it is worth noticing the similarities across gender. The majority of the adult population is constituted in both gender groups by individuals with medium educational attainment. Between 2004 and 2009 both men and women experienced an upgrade of education levels from low to high, the share of the medium educated remaining relatively constant. The only difference between genders can be observed in a higher share of high educated women compared to men and, respectively, a lower share of low educated women compared to men. While this gender difference decreased between 2004 and 2009 by 1.3 percentage points for the low educated, it increased by 1.3 and 2.6 percentage points for the medium and the high educated respectively.

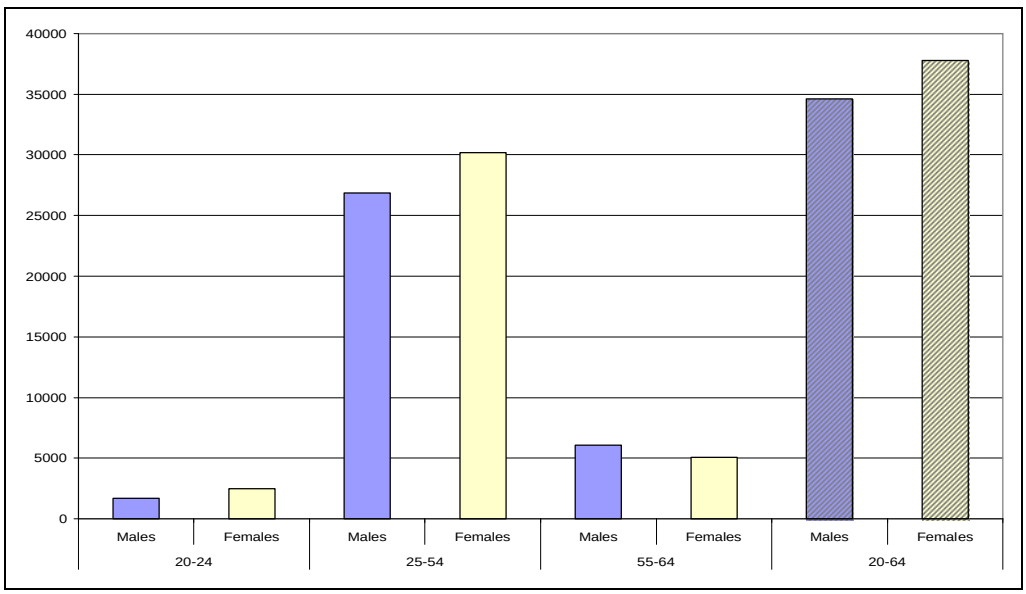
Figure II.4.8: Educational attainment by gender (EU-27) (20-64 years old)

	Men			Women		
	2004	2009	Change	2004	2009	Change
Below upper secondary education	28.3	25.2	-3.2	30.3	25.9	-4.5
Upper secondary and post-secondary non-tertiary education	51.6	52.4	0.8	47.9	47.4	-0.5
Tertiary education	20.1	22.4	2.4	21.8	26.7	5.0

Source: Eurostat (LFS)

Figure II.4.9 reveals that these increases in the gender differences in high educational attainment are mainly found among 25-54 year-old women, and to a lesser extend among the 20-24 year-old women.

Figure II.4.9: Generational differences in high educational attainment by gender, 2009



Source: Eurostat (LFS).

In a context of economic downturn, it is also important to investigate how much educational attainment impacts on the quality of employment. One common way of looking at it is by assessing how labour markets reward the knowledge and skills acquired through education and training. Such analysis consists in estimating the private financial returns to education (in terms of wages). Another way of assessing the quality of the supplied skills is by investigating the degree of match between the educational attainment and the type of occupation. This section reviews recent research on both aspects, starting with education returns and following with skills (mis)match indicators.

Research on returns to education has over the past decades produced ample evidence that the monetary and non-monetary prosperity of individuals is related to their level of education and training. Education yields substantial returns to the individual in terms of earnings and employability and significant gains to society in terms of economic growth and wider social benefits.

Figure II.4.10 shows the annual median net income of workers by education level and confirms that in every EU country, the higher your skills level the higher your average income (yet with significant country variations in terms of level of annual net income).

Figure II.4.10: Annual median net income of workers in Euros, by educational attainment (x 1000 Euros)

	Below upper secondary education	Upper secondary education	Tertiary education
EU 27	12.7	14.7	21.7
Belgium	16.7	20.2	25.4
Bulgaria	2.1	3.2	4.4
Czech Republic	6.2	7.8	10.3
Denmark	23.2	26.3	30.8
Germany	15.7	19.0	24.7
Estonia	5.3	6.3	8.8
Ireland	18.7	23.8	32.1
Greece	9.7	11.8	17.6
Spain	11.9	14.7	19.6
France	17.6	19.9	25.3
Italy	14.1	18.0	23.9
Cyprus	14.8	17.8	23.6
Latvia	4.3	5.8	8.7
Lithuania	3.5	4.9	7.7
Luxembourg	25.6	32.8	46.4
Hungary	3.8	4.9	6.8
Malta	9.4	12.4	15.9
Netherlands	18.3	20.7	26.0
Austria	16.6	21.3	25.7
Poland	3.9	5.1	8.2
Portugal	7.9	10.5	17.3
Romania	1.6	2.5	4.4
Slovenia	10.4	12.1	16.5
Slovakia	4.6	5.9	7.7
Finland	19.7	21.3	27.3
Sweden	20.4	22.2	25.3
United Kingdom	13.4	16.8	23.4
Iceland	21.5	22.6	26.7
Norway	31.3	35.5	40.7
Switzerland	25.0	31.6	41.2

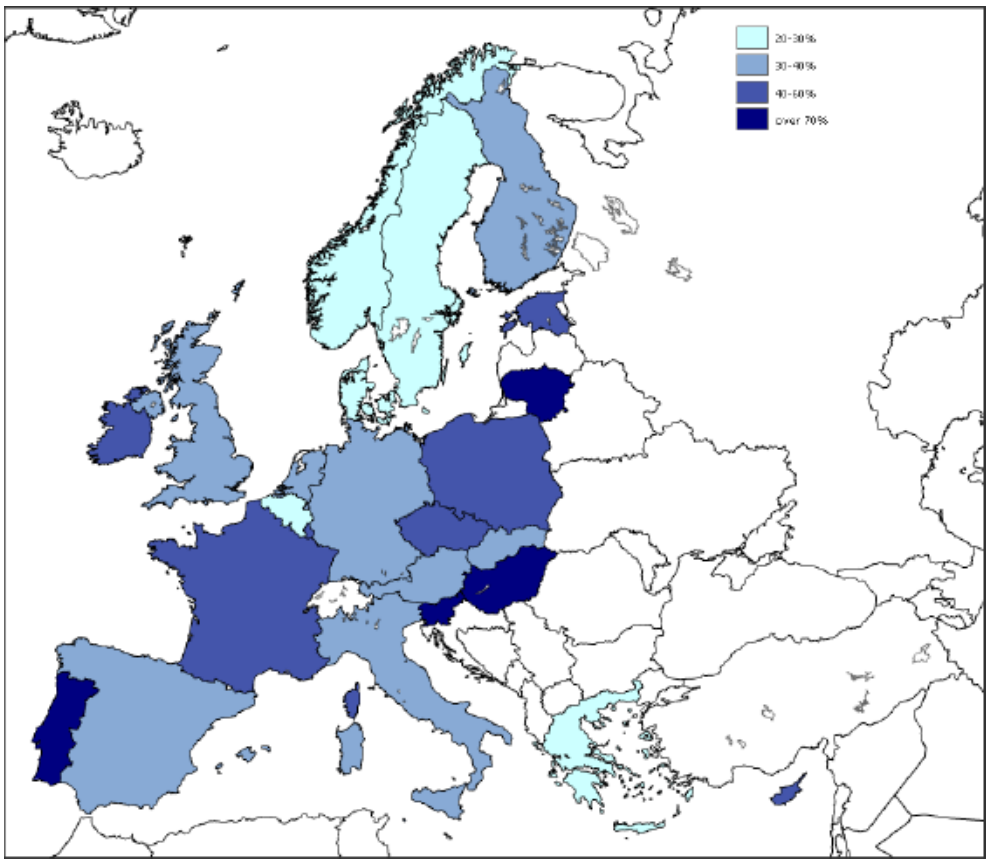
Source: Eurostat SILC, 2007.

A recent study on private returns as reflected in earnings to educational attainment in Europe (CRELL, 2010d) also corroborated this finding, again revealing considerable variations across Europe, with private returns ranging from a low 21% in Sweden to a very high 98% in Portugal. Looking more specifically at the returns to tertiary education revealed also great variability across Europe, with the highest wage premia to be found in the Eastern European countries and Portugal and the lowest in Nordic European countries (Figure II.4.11). The wage penalty for not attaining secondary education varies from 7% in Denmark to 31% in Austria (Figure II.4.12).

Recent research shows[37] a positive and long-term macroeconomic impact of an increase in the educational attainment of the working population.[38] Research simulated the effect of an increase in the share of medium-educated workers by 1 percentage point over 40 years and a similar decrease in the low-educated share. It found a positive impact on the productivity is found in all countries ranging from 0.27% (Ireland) to 0.90% (Portugal). The results show that where medium-educated labour is employed to replace low-education workers there are gains in efficiency. A second simulation modelled and increase in the EU high-educated labour share by 1 percentage point and a similar decrease in the medium-educated share. The results reveal a positive impact on productivity in the long-run ranging from 0.35% (Slovakia) to 0.82% (Italy). It can be concluded that investing in the higher education of the labour force would yield a significant positive macroeconomic impact at the EU27 level.

Good skills and competences derived from education are also crucial in social and civic life as warrants of community cohesion, personal fulfilment and happiness. Thus the benefits to high educational attainment are not only to be measured in terms of higher monetary returns but also higher non-monetary returns. Recent research has sought to measure total macro-economic returns to higher levels of skills, taking into account such non labour market impacts. For instance, the Bertelsmann Foundation (2009) has shown that a reform of an education system providing adequate skills for all citizens could increase GDP by as much as 10% in the long run.

Figure II.4.11: Wage premia for tertiary graduates in European countries

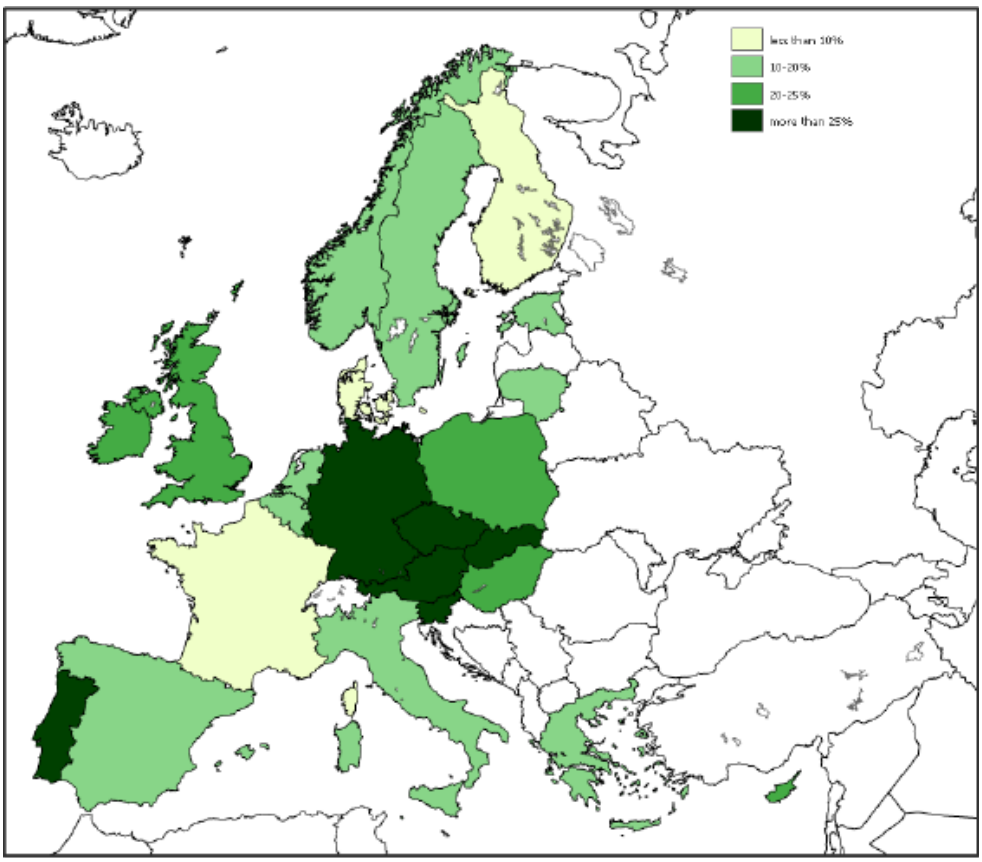


Source: CRELL (2010c) OLS estimates based on EU-SILC data.

[37] D'Auria, F., Pagano, A.m Ratto, M. and Varga, J. (2009)..

[38] Gross domestic product (GDP) is a measure of the economic activity, defined as the value of all goods and services produced less the value of any goods or services used in their creation. The calculation of the annual growth rate of GDP volume is intended to allow comparisons of the dynamics of economic development both over time and between economies of different sizes. For measuring the growth rate of GDP in terms of volumes, the GDP at current prices are valued in the prices of the previous year and the thus computed volume changes are imposed on the level of a reference year; this is called a chain-linked series. Accordingly, price movements will not inflate the growth rate.

Figure II.4.12: Wage penalties for not attaining secondary education in European countries



Source: CRELL (2010c) OLS estimates based on EU-SILC data.

4.3. Providing the right skills and the cost of mismatching

Another tool of assessment of the capacity of the E&T systems to respond to the needs of the labour markets is the estimation of the degree of matching and mismatching between occupation and educational level. As reported by the European Commission (2010b), upgrading skills and reducing skills mismatch are important not only for individuals to find a job or not to lose contact with the labour market during the downturn, but also at the macro-level to facilitate an efficient job reallocation across industries when growth resumes. A Cedefop (2010) report on skills matching underlines that skill mismatch is a widespread phenomenon in Europe, with over-education incidence averaging around 30 % and with - at the same time - a substantial share of the population under-educated. Skill mismatch has negative consequences in terms of less satisfied workers, lower productivity at the enterprise level and may lead to a loss of competitiveness in general. Factors responsible for the occurrence of mismatch are asymmetry in labour-market information, insufficient training, education and training systems responding slowly to market changes, labour shortage, skill-biased technological progress and business cycles.

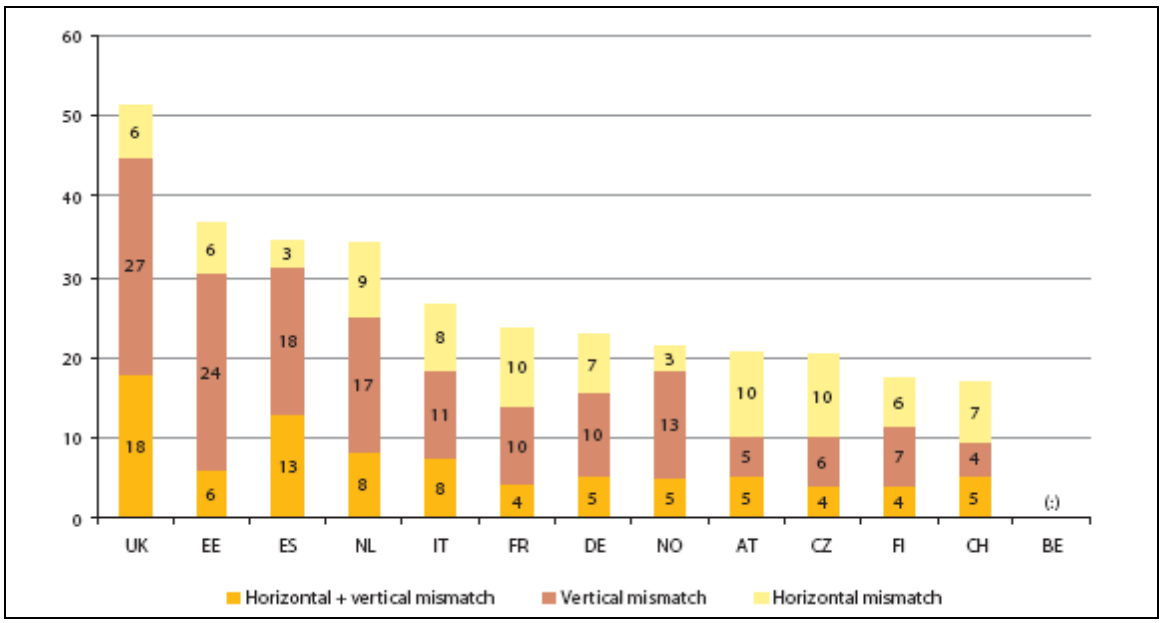
Another perspective on the comparative utility of educational attainment can be provided by turning to educational attainment and the skills required in a graduate's current occupation; in other words, a look at the quality of the job obtained.

On the basis of the Reflex survey, collected in all countries forming the Bologna Area, it is possible to provide a more comprehensive perspective on skills mismatch looking at both horizontal and vertical mismatches together.[39] Based on survey data, this section captures graduates' self-perception on whether their current occupation 'fits' their academic studies. It may be assumed that the closer the fit, the higher the self-perception of the utility of tertiary education for these graduates.[40]

[39] Qualification mismatch as measured by the Reflex survey is measured by self-assessment. The individuals of the sample (people who graduated 5 years ago) were asked to assess their job in relation to their education. The measure is certainly less standardized than a variable based on the ISCO international classification. However, a distinction is made between three types of mismatch: horizontal mismatch (being at the relevant skill level, but in another field than that of graduation), vertical mismatch (being employed in the same field as the educational attainment employed below their theoretical skill level), and both. The two latter categories correspond to the vertical mismatch as considered in the previous indicators. As for previous figures, only workers are included in the denominator; unemployed persons are excluded.

[40] However, it should be noted that this argument assumes a rather static view of the labour market, as the labour market is likely to adapt to the situation by providing more highly-skilled jobs (i.e. move towards becoming a "knowledge society").

Figure II.4.13: Qualifications mismatch as reported by employed graduates with more or less 5 years of experience since leaving higher education, by type of mismatch (horizontal, vertical, or both), %, ISCED 5A second degree - 2005



Source: Reflex, 2005.
Note: Countries are sorted in ascending order by exact match. BE: data not reported due to a low return rate.

Figure II.4.13 reveals that, in around half of the countries surveyed, 20 % or more of young workers with tertiary education are employed below their theoretical skill level (vertically mismatched). Moreover, being employed at the relevant skill level but in another field (horizontal mismatch) was reported by between 3% and 10% of graduates, with the highest levels registered in France, Austria and the Czech Republic. Combining horizontal and vertical mismatch, over a quarter of graduates consider themselves to have a job not fitting their educational attainment in the Netherlands (25%), Estonia (30%), Spain (31%) and the United Kingdom (45%). The self-perceptions from the Reflex survey are quite consistent with the match rates obtained in LFS by the ISCO methodology. [41]

Current research within CRELL is aiming to measure the impact of skills mismatch (as estimated from the qualifications of ISCED 3-4 school leavers) on GDP growth; initial findings point to an impact but need to be further developed.

[41] Eurostat (2009). The Bologna Process in Higher Education in Europe: Key indicators on the social dimension and mobility. Luxembourg: Office for Official Publications of the European Communities.

CHAPTER III

Promoting equity, social cohesion and active citizenship

In the Conclusions of May 2009, establishing the strategic objectives for the future cooperative exchanges on Education and Training (E&T 2020), the Council set out a central challenge for education systems: "Education and training policy should enable all citizens, irrespective of their personal, social or economic circumstances, to acquire, update and develop over a lifetime both job-specific skills and the key competences needed for their employability and to foster further learning, active citizenship and intercultural dialogue". This chapter reviews a range of issues, some of which play a crucial role in promoting social inclusion and breaking the intergenerational transmission of poverty, such as early childhood education. It looks at challenges to equity, such as migration and gender differences and reviews the progress made in ensuring that all young Europeans are equipped with the key competences necessary for success in their adult life as citizens and on a knowledge-based labour market.

1. Equity

1.1 Early childhood education and care

There is a wide consensus that early childhood education and care (ECEC) is a crucial determinant of the later educational success of pupils and that the benefits of ECEC will be strongest for children from disadvantaged families (UNICEF Innocenti Research Centre. 2010).

In recognition of its importance, the Council decided to include a benchmark on ECEC in the framework for European cooperation in education and training 2010-2020 (European Council 2009). The equity dimension of early childhood education was particularly highlighted, as high participation and high quality provision can counter the risks of educational failure due to disadvantaged starting conditions, such as low socio economic background.

European benchmark
By 2020, at least 95% of children between 4 years old and the age for starting compulsory primary education should participate in early childhood education.

Figure III.1.1: Participation in early childhood education and care (rates) - 2008
(between 4-years-old and starting of compulsory primary)

	2000	2008
EU27	**85.6**	**92.3**
BE	99.1	99.5
BG	73.4	78.4
CZ	90.0	90.9
DK	95.7	91.8
DE	82.6	95.6
EE	87.0	95.1
IE	74.6	72.0
EL	69.3	m
ES	100.0	99.0
FR	100.0	100.0
IT	100.0	98.8
CY	64.7	88.5
LV	65.4	88.9
LT	60.6	77.8
LU	94.7	94.3
HU	93.9	94.6
MT	100.0	97.8
NL	99.5	99.5
AT	84.6	90.3
PL	58.3	67.5
PT	78.9	87.0
RO	67.6	82.8
SI	85.2	90.4
SK	76.1	79.1
FI	55.2	70.9
SE	83.6	94.6
UK	100.0	97.3
HR	n.a.	68.0
IS	91.8	96.2
MK*	17.4	28.5
TR	11.6	34.4
LI	69.3	83.2
NO	79.7	95.6
CH	n.a.	77.9
US	69.9	65.4
JP	95.5	97.0

Source: Eurostat (UOE)
m: missing - *MK: The former Yugoslav Republic of Macedonia; see Annex 2
UK: Break in series 2002 - 2003; earlier figures are overestimated; NL: break in series 2003 - 2006, IE: Data are incomplete as for private provision

The EU average participation in early learning has been rising during the decade to 2008 (6.7% percentage points increase - see figure III.1.1 and figure annex III.1). In several countries rates are already above 95%, giving an indication of almost universal attendance of education from age 4. This is especially the case in France, the Netherlands[42], Belgium, Spain, Italy and Malta. The vast majority of other countries have rates above 90% while another group e.g. Cyprus, Latvia and Romania shows a steep growth towards rates exceeding 82%.

A small group of countries diverge from the general pattern. These include Poland and Greece[43] (around 68% in the year 2000) and Finland (70.9%), that are quite far from the benchmark. The same applies to Ireland where even though available data are only partial participation rates have even decreased since 2000. The availability of alternative types of provision, such as the family day care attended by a number of children in Finland, could contribute to a lower level of participation in ECEC. Other underlying reasons could be: funding decisions at the local or national level; operational constraints in increasing the supply of early childhood education in specific areas of the country, or for specific groups of children; cultural norms and pedagogical approaches (EURYDICE. 2009).

Figure III.1.2: Ratio of pupils to teachers in ISCED 0 -2008

	Ratio of pupils to teachers in ISCED 0		
	2005	2007	2008
EU-27	**14.2**	**14.1**	**13.7**
Belgium	16.1	16.0	15.9
Bulgaria	11.5	11.4	11.4
Czech Republic	13.5	13.6	13.7
Denmark	6.6	6.0	6.2
Germany	13.9	14.4	13.8
Estonia	7.1	na	na
Ireland	na	na	na
Greece	12.5	11.9	na
Spain	14.1	13.7	13.1
France	19.3	19.2	19.0
Italy	12.4	11.8	11.2
Cyprus	18.5	17.7	17.6
Latvia	14.4	10.9	10.6
Lithuania	8.4	7.8	7.5
Luxembourg	na	12.6	12.2
Hungary	10.7	10.8	10.9
Malta	11.2	na	13.2
Netherlands	na	na	na
Austria	17.0	16.4	16.3
Poland	17.9	18.6	18.8
Portugal	15.4	15.9	14.7
Romania	18.3	17.8	17.4
Slovenia	9.6	9.4	9.4
Slovakia	13.6	13.4	13.3
Finland	12.5	11.4	11.4
Sweden	11.9	11.6	6.1
United Kingdom	11.9	13.2	17.9
Croatia	12.6	12.4	12.6
Iceland	na	7.1	7.2
MK*	11.5	11.3	7.5
Turkey	19.7	25.9	27.1
Liechtenstein	13.2	11.1	10.8
Norway	na	na	na
Switzerland	na	na	na
USA	10.6	10.3	13.4
Japan	17.4	16.8	16.5

Source: Eurostat (UOE)
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

As for candidate countries, participation in early childhood education is far from the EU benchmark. The highest participation rate is found in Croatia (68%) while in Turkey and The former Yugoslav Republic of Macedonia only about one third of children attend pre-primary education.

[42] There is no ISCED 0 pre-primary education in the Netherlands, so ISCED 1 primary education is the initial stage of organized education for children from age 4.
[43] From 2008, one year of pre-school education became compulsory from age 5. The same is true for Poland but ISCED 0 compulsory starts at age 6.

Industrialized countries outside the EU, such as Japan and USA, are quite different in terms of early learning: in the former it is almost universal (97%) while in the latter just two out of three children attend early education (Figure annex III.1).

In most countries with low participation rates, growth in recent years has been notable. The highest increase has been realized by two countries, namely Cyprus and Latvia[44] that succeeded in raising the participation rate from about 65% to more than 89% since 2000. Also in Finland and in Lithuania rates increased notably (around +28%).

The issue of quality

In the context of the expansion of early childhood education and care provisions, interest in quality of ECEC is gaining momentum worldwide, as evidenced in recent work by the OECD, UNESCO, UNICEF and the World Bank. Within the EU, bodies such as Eurydice and NESSE[45] have also been active in reviewing practices and research on quality as well as equity-related issues. The interest in both areas stems in part from the idea that care of the youngest participants, educated apart from their families for the first time in their lives, needs to be deeply embedded in the process of early childhood education and the idea that the quality of care at this stage will have learning implications that last a lifetime.

The training, pay, working conditions and motivation of staff and the support they are given are important factors for quality in ECEC provision. Other important factors identified as necessary for quality provision include: the involvement of parents, a favourable child/staff ratio and the governance structures necessary for regular programme monitoring and assessment, system accountability and quality assurance (NESSE. 2009; Eurydice. 2009; Council. 2010).

Regarding child/staff ratios, recently UNICEF suggested that a maximum level of 15 children to 1 teacher could be considered appropriate (UNICEF, 2008), though this differs according to age of the children. The EU average is slightly less than 14 children per teacher and it has been steadily decreasing over the last 5 years (see figure III.1.2 and figure annex III.2). The ratio ranges from around 6 children per teacher in Sweden and Denmark to about 19 in Poland and France. Several other Member States have average ratios above the norm proposed by UNICEF, namely the UK, Cyprus, Romania, Austria and Belgium. Among candidate countries, Turkey has a very high ratio (around 26 children for each teacher) while Croatia and The former Yugoslav Republic of Macedonia are both in line with the recommendations.

In the US, a low level in participation combines with a favourable child/teacher ratio (13.4) while in Japan, where participation is much higher, on average, a teacher takes care of more than 16 children.

Children with disadvantaged background

According to research and international surveys, there are many socio-economic background factors which increase the likelihood that certain children or groups of children will not participate in early childhood education. When considering personal (e.g. socio-emotional development and cognitive gains) and social outcomes (e.g. reduced chances of negative social behaviour), there is evidence that it is children from such backgrounds who have the most to gain, including in a longer term perspective, from high-quality early learning experiences (Leseman, 2002, 2009; Machin, 2006; Eurydice, 2009).

Demographic issues, such as location of residence (urban or rural) play a role in some countries; the UNESCO 2007 Global Monitoring Report (GMR) concluded that place of residence was an important factor in accounting for participation disparities, usually favouring urban children. Family type is also an issue in some countries such as children from one-parent families or those from very large families as these children are enrolled less frequently (Eurydice, 2007; UNESCO, 2007).

Household wealth influences participation in ECEC when fees are charged as low-income families attend less frequently (Chiswick and De Burnam 2004; Bainbridge et al. 2005 in OECD 2007). The GMR stressed that poverty, alongside place of residence, is a key factor in explaining disparities in ECEC enrolment worldwide.

Most of these reasons contribute to low participation in ECEC among certain ethnic minorities, such as Roma children. Participation rates in countries where the Roma community is quite large, such as Romania and Slovakia, are substantially lower than the average (Open Society Institute, 2007; Ringold, D. and al. 2005). In other countries, such as Spain, targeted measures aiming at increasing the access to education of "Gitano" children have resulted in participation rates of 74% (EUMC. 2006).

[44] Compulsory ISCED 0 pre-primary education in Cyprus begins at 4 years and 8 months while in Latvia 2 years of pre-primary are compulsory from age 5.

[45] NESSE is the "Network of Experts on Social Aspects of Education and Training", a network of independent experts supporting the Commission between 2007 and early 2011.

When available, ECEC seems to pose one solution to social exclusion and reduce educational disadvantages. Several countries have implemented specific early childhood educational programs as part of their anti-poverty policies. An example is the Sure Start program in the United Kingdom. Participation in regular childhood programs, as Nusche (2009) reports, also improves the educational attainment of disadvantaged children.[46]

It is important to treat equity and quality – discussed above, as interrelated since the most vulnerable groups, such as those from low-income families, are less likely to experience a quality education (Eurydice 2009; Nusche 2009; UNESCO 2010). In addition, lower quality programmes may reinforce negative outcomes such as aggressive behaviour and poor language development (NESSE. 2009), so the combination of equity-quality objectives within ECEC is of great importance for later life development of Europe's children.

Section 4.2.1 sets out an interesting new analysis which suggests that, at least in some countries, the rate of attendance at early-childhood education among migrant pupils is as high as or even higher than for native children.

1.2 Early leavers from education and training

Young people who abandon education and training with only lower secondary education or less are more often unemployed or in precarious employment. They generally earn less, are more dependent on social support throughout their lives and face a higher risk of poverty and social exclusion.

The Europe 2020 Strategy defines the reduction of early school leaving to less than 10% by 2020 as one of its headline targets. It is strongly related both to smart and to inclusive growth as it impacts directly on the employability of young people and their integration into the labour market. Reducing early school leaving is an important contribution to breaking the cycle of deprivation, social exclusion and poverty.

The EU benchmark

A benchmark on early leavers from education and training had already been established for 2010 as part of the open method of coordination for Education and Training. In 2010 it was reaffirmed and given new priority as a headline target within Europe 2020: the ratio should, by 2020, be less than 10% in the EU.

European benchmark
By 2020, the share of early leavers from education and training should be less than 10%.

The trend since 2000 has been one of very slow progress. In 2009 the average rate of early leaving was 14.4% for EU-27, showing a slight decrease from the previous year, when it was 14.9%, and 3.2 percentage points lower than in 2000 (Figure III.1.3)[47]. Despite progress, the rate is still well above the target set for 2010 (and now re-affirmed for 2020).

The situation is quite diverse across Member States. A number of countries mainly in Central and Eastern Europe are already well above the benchmark, the best performers are Slovakia, Slovenia and Poland. These countries were already below 10% at the beginning of the monitoring period and have further improved their performance since 2000.

Several countries, notably in Northern and Western Europe are near the benchmark, with shares not exceeding 12%. Some within this group have witnessed positive changes since the year 2000, such as Cyprus (- 37% in relative terms) and the Netherlands (-29%).

In various southern states the situation is still problematic: in Malta, Portugal and Spain the rate of early leavers exceeds 30%, in Italy it is close to 20%. Since 2000, Malta and Portugal experienced a significant decrease in the rate, respectively 17 and 12 percentage points and also expect that policy change in recent years will have further effect on the figures in years to come. Despite the slow pace of improvement, the decrease in rates of early leaving is found in practically all countries. A few countries experienced an increasing rate from 2008 to 2009. Among those still above the benchmark are Lithuania, Romania, Norway and France.

Member States' targets, as set out in their first provisional National Reform Programmes, are by and large very cautious and would suggest that Europe may fall short of the 10% target for 2020. The targets submitted in the draft NRPs (not including countries that have not yet defined targets), that a rate of 10.5% early school leavers would be achieved by 2020, thus missing the common European target of 10%. In absolute figures this would

[46] It is argued that "attending the French pre-primary education system (école maternelle) increases class retention of low-income and immigrant children in primary school by 9% to 17%, with wider reported benefits for literacy and numeracy".
[47] In 2009 Eurostat refined the calculation method for this indicator. See Eurostat website for more details.

mean that in 2020 roughly an additional 200 000 young Europeans would have dropped out from education and training.

Candidate countries are positioned at two extremes: on the one hand is Croatia, with an extremely low rate (3.9%) while at the other extreme is The former Yugoslav Republic of Macedonia and Turkey, where the percentages are extremely high, respectively 36.8% and 44.3%.

The prevalent pattern across EU countries shows higher risk of being early leavers for males, as compared to females, and for migrants with respect to native young people (see also section III.3 and III.4).

Figure III.1.3: Early leavers from education and training 2000, 2008 and 2009 (% of 18-24 year olds)

	Early school leavers (18-24). %		
	2000	2008	2009
EU-27	17.6	14.9	14.4
Belgium	13.8	12.0	11.1
Bulgaria	:	14.8	14.7
Czech Republic	:	5.6	5.4
Denmark	11.7	11.5	10.6
Germany	14.6	11.8	11.1
Estonia	15.1	14.0	13.9
Ireland	:	11.3	11.3
Greece	18.2	14.8	14.5
Spain	29.1	31.9	31.2
France	13.3	11.9	12.3
Italy	25.1	19.7	19.2
Cyprus	18.5	13.7	11.7
Latvia	:	15.5	13.9
Lithuania	16.5	7.4	8.7
Luxembourg	16.8	13.4	7.7 b
Hungary	13.9	11.7	11.2
Malta	54.2	39.0	36.8
Netherlands	15.4	11.4	10.9
Austria	10.2	10.1	8.7
Poland	:	5.0	5.3
Portugal	43.6	35.4	31.2
Romania	22.9	15.9	16.6
Slovenia	:	5.1	5.3 u
Slovakia	:	6.0	4.9
Finland	9.0	9.8	9.9
Sweden	7.3	12.2	10.7
United Kingdom	18.2	17.0	15.7
Croatia	:	3.7	3.9 u
Iceland	59.3	45.5	44.3
MK*	29.8	24.4	21.4
Turkey	:	19.6	16.2
Liechtenstein	:	:	:
Norway	12.9	17.0	17.6

Source: Eurostat (LFS);u=unreliable. b= break
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

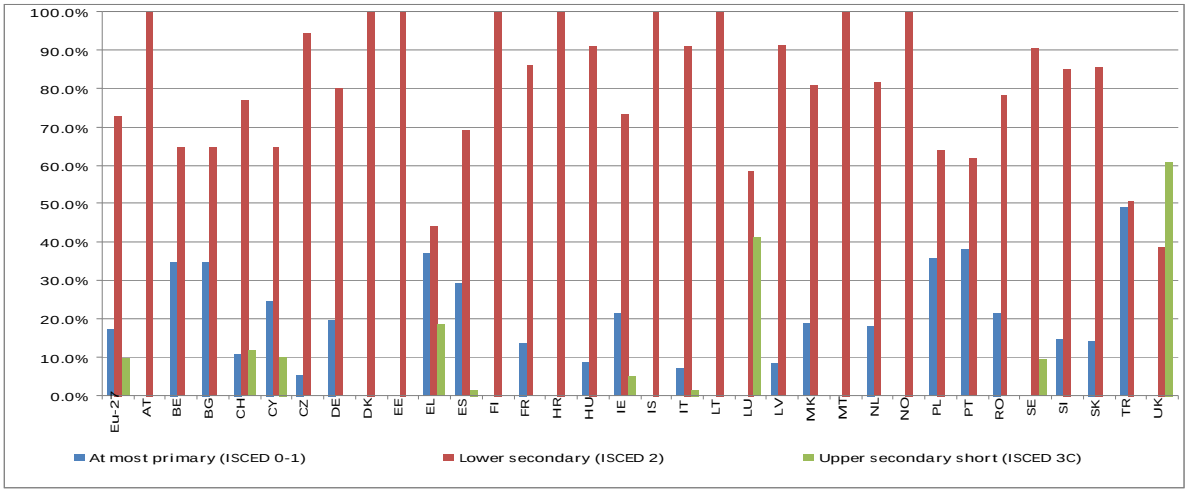
Highest educational level achieved before leaving education and training

The majority (72.9%) of early school leavers in the EU have obtained lower secondary level qualifications by the time they leave i.e. compulsory education in most European countries (figure III.1.4). The percentage of those who completed a short period of upper secondary education, a level which is offered in only a few countries (ISCED 3C short courses, including some vocational or pre-vocational training), remains at just under 10%, with no substantial change from the previous year. Nevertheless they constitute a high proportion of all early leavers: in Luxembourg (41.2%) and the UK (61.1%).

Considering that very low educational attainment is among the risk factors most directly associated with social exclusion, the fact that 17.4% of early leavers in the EU have completed at most primary school is a matter of major concern. Drawing on available and reliable figures, this category is absent in the Nordic countries, Austria, Estonia, Croatia, Lithuania, Malta and the UK, but is particularly evident in Belgium (35.1%), Bulgaria (38%), Greece (37.2%) and Portugal (38.1%).

Among the countries compared, Turkey is the one with the highest percentage of low or very low educated early leavers; in fact, the percentage of early leavers with at most primary education and that of lower secondary are nearly the same, with 49.2% of those leaving having completed only primary education and 50.8% with lower secondary completion only.

Figure III.1.4: Early leavers from education and training by highest educational level completed. 2009 (%)



Source: Eurostat (Labour Force Survey), 2009
Notes: For ISCED 1 CZ. SI, SK, LV, MK* lack reliability due to small sample size; for ISCED 2 HR, SI, LU; and for ISCED 3C IE, CY and LU
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

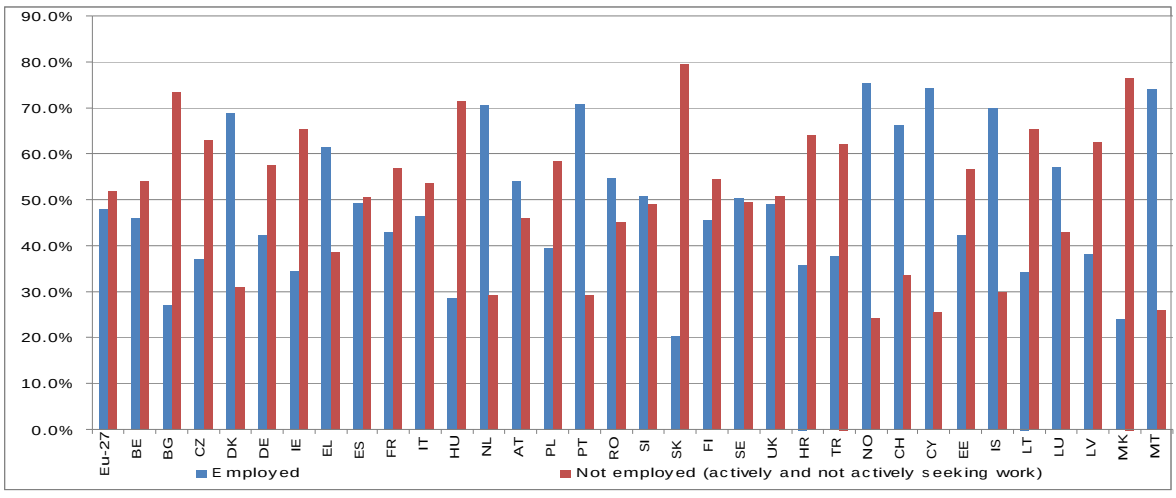
Employment status of early leavers from education and training

Nearly half (48%) of early school leavers in the EU-27 countries in 2009 are employed, while 52% are unemployed or not seeking employment (figure IIII.1.5). Comparing these figures with those for 2008, there are fewer employed early school leavers and more who are unemployed or not seeking entry to the labour market, almost certainly reflecting the impact of the economic crisis.

In the majority of countries, most early leavers are not employed or not in search of work. However, there are some significant exceptions to this.

Among Member States, the highest percentages of those who are employed are in the Netherlands (71%), Portugal (71%), Cyprus (74%) and Malta (74%). It is apparent that in these countries young people are abandoning school to enter a labour market that offers possibilities for low-skilled employment. At the other end of the spectrum, there are relatively high proportions of unemployed and inactive early leavers in Bulgaria (73%), Hungary (71%), Slovakia (80%), Lithuania (66%) and the former Yugoslav Republic of Macedonia (77%).

Figure III.1.5: Early leavers from education and training by employment status. 2009 (%)



Source: Eurostat (Labour Force Survey). 2009
Notes: Data from SI, HR, EE, LU show a lack of reliability due to small ample size for both categories and for LT and MK* for employed only.
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

A comparison with third countries

The indicator mainly used to monitor the equivalent to early school leaving in extra-EU countries is the 'dropout rate'. Even if its definition is different from the one used at the EU level, it is suitable for some comparisons.[48]

In the United States, the national dropout rate was 8.0 % for the 2008/2009 school year, with a long term downward trend since 1972, when it was 14.6%.[49] Similar to the situation in the EU states, males are more likely than females to drop out, while significant gaps persist among ethnic groups: students belonging to those groups that are most disadvantaged in socio-economic terms (Hispanics, Native Americans and AfricanAmericans) present the highest risk of abandoning school prematurely. Also, the Southern and Western states have higher dropout rates than the North-eastern states and the Midwest (U.S. Department of Education. 2010).

In Canada the countrywide dropout rate, as reported by the Labour Force Survey Statistics, was 9.8 % for the 2004/2005 school year which marked a decrease from 10.7 % in 2001.[50] There is clear evidence that young people who leave education before obtaining their high school credentials have more difficulties in being employed, especially in times of recession (Statistics Canada. 2005). As a result, Canada has initiated a number of strategies to further decrease the rate by retaining students at school or through offering second-chance programs.

Compared to other OECD countries, the share of school dropouts[51] in Japan remains relatively low: in 2003 it was just 4.5%. However, the rate has risen slightly during the last decade (OECD. 2008).

As opposed to other industrialized countries, there are no substantial gaps due to ethnic or linguistic differences in Japan, since the country has a relatively homogenous population and low levels of immigration. Recent investigations on public education in Japan have pointed out that there are significant variations in the dropout rates in terms of family income and high school academic ranking: dropouts are much more frequent among students from disadvantaged families studying at low-ranking high schools than among those who are enrolled at elite academic high schools (Tomoaki. 2006).

1.3 Special educational needs

The inclusion of students with special education needs (SEN) in mainstream schools and, more generally, the goal of inclusive education, has been part of the EU agenda in the field of equity in education for several years. Recently, Council Conclusions on a Strategic framework for European cooperation in education and training identified, among the objectives for the period 2010-2020, the need "to ensure that all learners – including those …with special needs…- complete their education" (Council. 2009).

There are substantial differences between countries in the definition of what constitutes a special need. Therefore, two different approaches have been applied in the field of international studies on SEN. The first one uses national definitions as the basis of data collection. This is the approach followed by the European Agency for Development in Special Needs Education. An alternative approach, developed by OECD, and then followed by CRELL, in order to collect more internationally comparable data, was discussed in the 2009 Progress Report.

Recently, Eurostat launched a new project in order to answer the Council request to provide information on the definition of an indicator on special needs education, appropriate data to monitor progress in SEN and other relevant technical specifications (Council. 2007).

National classifications of special educational needs (SEN)

The approach followed by the European Agency uses figures on SEN as reported by each country. These figures are strongly related to administrative, financial and procedural regulations, which can differ widely.

Countries include different categories of learners within their definitions of SEN such as disability (sensory, physical and psychological), learning difficulties, behaviour problems, health problems, social or other kinds of disadvantages (see Watkins. A. (Editor), 2009).

[48] the EU indicator covers, i.e. students giving up their studies, failing their exams (both in programmes of a level classified at ISCED 3 or lower) or deciding to leave secondary education (i.e. leaving "early"), without necessarily failing in a higher educational programme.

[49] They are defined as 16 - 24 years old who are not enrolled in school and have not earned a high school credential (diploma or equivalency credential).

[50] They are defined as 20-24 years olds that are neither attending school nor have a high school diploma.

[51] They are young people between 15 and 24 years old leaving school without upper secondary education.

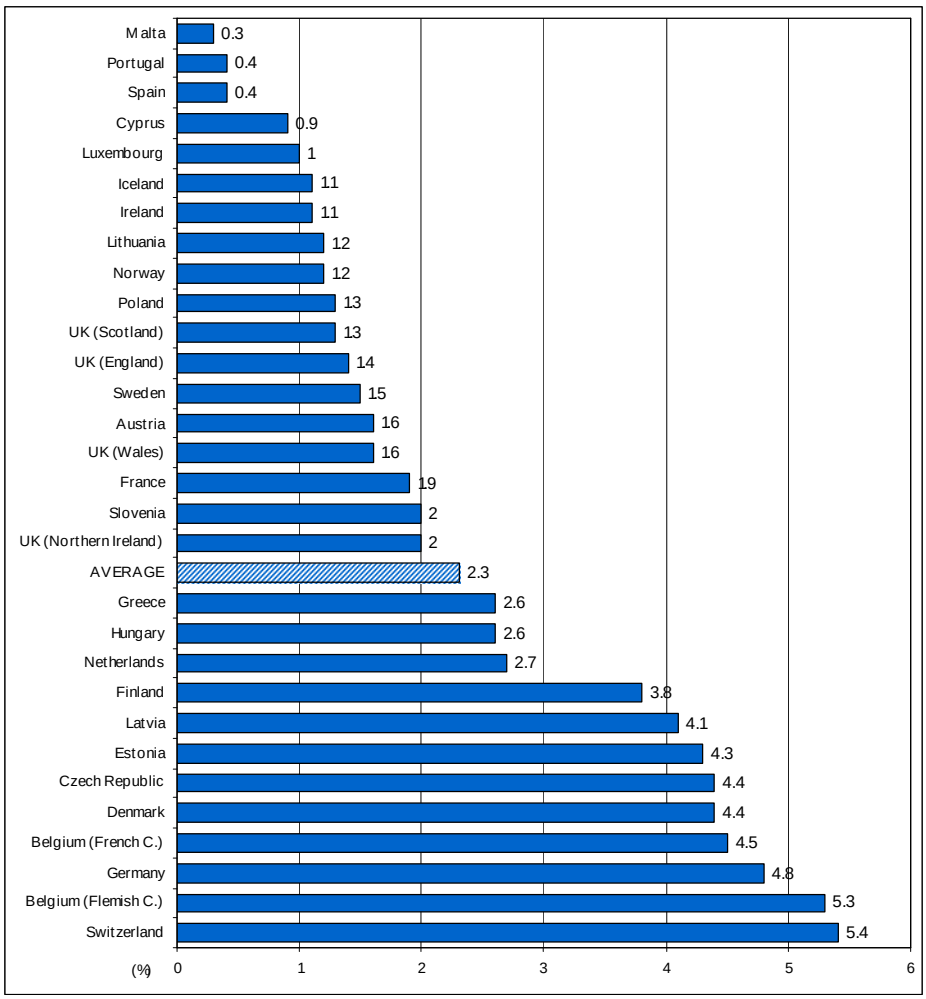
A clear definition of what is meant by inclusive education and a segregated setting does not exist in all countries' legislation and is not always used to produce an official decision. Therefore, when interpreting data some considerations should be taken into account:

- National figures may only cover SEN pupils with an official designation, but in some countries other pupils are also included;
- Some countries do not count pupils in fully inclusive settings, even if they receive some form of support for their special needs;
- Decisions of SEN are not in themselves comparable. The decision-making process is often an exercise that acts as a mechanism for resource allocation.

Special educational needs (SEN) pupils in segregated settings

Nevertheless, it is possible to compare the percentage of pupils in compulsory school who are educated in segregated settings, as this refers to a category that most countries use in data collection.[52]

Figure III.1.6: Percentage of pupils with SEN in all segregated settings (separate schools and classes)



Source: DG Education and Culture and European Agency for Development in Special Needs Education

Additional notes:
- All data has been rounded up to 1st decimal place.
- Percentages are calculated against the overall population of pupils in the compulsory sector.
- Average calculated as arithmetic average of countries mentioned in the figure.
- Data refer to following academic year:
  2009-2010: Czech Republic, Estonia, Greece, Lithuania, Malta, Netherlands, Norway, Poland, Slovenia, UK (Northern Ireland), UK (Scotland)
  2008-2009: Austria, Belgium, Cyprus, Denmark, Finland, France, Hungary, Iceland, Ireland, Latvia, Luxembourg, Sweden*, Switzerland, United Kingdom (England and Wales)
  2007-2008: Germany, Portugal, Spain

*Academic year's data on the overall compulsory school aged population and SEN related data may differ. Please refer to 'Special Needs Education Country Data 2010' for full details.

[52] The agreed operational definition of a segregated setting is the following: Segregation refers to education where the pupil with special needs follows education in separate special classes or special schools for the largest part (80% or more) of the school day.

The expected trend would be in the direction of a decrease of that percentage, as there is a growing consensus that, whenever possible, pupils with special education needs should be included in regular, mainstream schools rather than in special institutions. During the period 2004-2010, the percentage of SEN pupils in segregated settings did in fact increase in most countries. Currently the EU average of SEN pupils in compulsory education taught in segregated settings is 2.3%, including both special schools and segregated classes in mainstream schools (see figure III.1.6). Notwithstanding this, some changes in national legislation and policy for SEN do highlight possible moves towards inclusion that may later have an impact on this measure.

The situation varies between individual countries. The indicator is about 4-5% in Belgium, Germany, Denmark, Estonia, Latvia and the Czech Republic. It is low (i.e. below 1%) in most Southern European countries. In Italy, where a fully inclusive policy has been put in place, almost no pupils with SEN are educated in segregated settings. Among those above the EU average, the increase during this period was notable in Denmark and the Netherlands. Decreases were most evident in countries with an already low rate of SEN pupils in segregated settings.

1.4 Adult education and training: informal learning

The benchmark on participation in adult learning for 2020 (which updates the one in place for 2010) is analysed in Chapter 1. In this section, the results of the EU survey on adult education (AES) are analysed to allow a deeper insight into EU-wide practices regarding informal learning.

Informal learning is described as being learning which is "…intentional, but less organised and less structured and may include for example learning activities that occur in the household or in the daily life". Measuring it posed some problems in the AES, in terms of phrasing of the relevant questions and ensuring comparability of results. This is due to the inherent unstructured nature of informal learning. Even though some caution is needed when analysing results, it is certainly a part of the lifelong learning process that cannot be overlooked and the results point to significant disparities in participation related to socio-economic factors and it is, thus, highly relevant to discussions of equity and inclusiveness of education systems.

Informal learning

Figure III.1.7: Participation in informal learning by learning method (rates. 25-64 years old) 2007

	Total	Learn from a family member. friend or colleague	Learn using printed materials	Learn using computers	Learn through television/ radio/ video	Learn by guided tours of museums. historical/ natural/industrial sites	Learn visiting learning centres (including libraries)
EU 22 countries	46.5	19.2	35	26.9	18.3	10.4	8.1
Belgium	34.9	15.2	22.5	24.3	7.1	4.8	7.4
Bulgaria	28.0	8.6	18.3	17.8	13.1	2.0	3.2
Czech Republic	54.7	18.9	42.1	33.2	29.0	8.5	6.5
Germany	52.4	18.8	40.4	33.9	15.8	8.0	6.8
Estonia	44.8	27.2	28.9	27.0	22.6	15.9	14.4
Greece	20.7	5.6	16.3	11.8	8.3	2.0	2.4
Spain	28.0	11.1	16.6	15.7	6.7	5.2	5.1
France	63.8	26.5	46.1	42.1	39.8	24.6	17.1
Italy	41.2	24	26.6	23.0	15.1	13.3	4.6
Cyprus	63.6	33.3	44.7	22.8	32.7	8.7	5.1
Latvia	53.9	33.1	41.3	28.3	36.8	10.5	11.3
Lithuania	45.3	20.7	32.7	23.9	16.4	3.9	9.6
Hungary	26.2	11.6	18.6	15.2	16.4	6.2	5.7
Netherlands	:	:	:	:	:	:	:
Austria	75.7	44.1	61.7	43.1	38.4	31.5	14.4
Poland	25.4	9	20.5	17.1	11.3	3.2	6.4
Portugal	38.9	24.4	22.2	20.5	10.1	5.3	3.4
Slovenia	62.0	26.8	45.8	41.7	26.7	20	26.1
Slovakia	84.1	38.5	67.6	51.5	69.8	19.7	20.5
Finland	54.6	17.3	38.3	32.1	12.1	11.0	27.8
Sweden	76.0	43.9	60.2	54.9	25.4	22.6	23.5
United Kingdom	53.7	14.3	50.4	19.0	13.0	3.3	5.7
Croatia	44.6	24.8	30.1	27.1	25.4	8.0	9.8
Norway	72.3	45.5	51.6	47.5	26.6	19.7	18.1

Source: Eurostat (AES)
Note: Data for Poland are not included in the EU average because of the very high non response rate. High values for Slovakia might be due to the likelihood that random learning was considered as informal learning.

In 2007, the EU participation rate for informal learning among adults was 46.5%, notably higher than the rate for non-formal activities (32.7%) and formal education (6.3%).
The most used learning resources are printed materials (used by 35% of learners) and computers (27%). The exchange of knowledge between members of the family, friends or colleagues is indicated by almost one fifth of the adults interviewed. The least frequent way of learning is visiting learning centres or libraries (Figure III.1.7).

Some national peculiarities emerge. In Belgium, the computer is the most frequent tool used for learning, whereas in some countries, such as Cyprus and the UK, this method is not particularly relevant, compared to learning through television (for the former) and using printed material (for the latter).

Family and work-place network is especially used for learning purposes in Portugal, where it is the most used method. In countries such as Belgium, Greece and the UK it is less used mainly in favour of printed materials.

An unequal participation

Participation in adult lifelong learning activities overall shows a very clear pattern, in which those who take less advantage of these opportunities are older people, the less educated and the non-employed. This is also the case for informal activities. The highest participation rates are those for adults between 25 and 34 years old (51.4%) (Figure III.1.8). The next age group (35-54) is not so far behind, while a notable decrease in the participation rate is found after 55, as it drops to 38.4% (or three quarters of the youngest age group). The decrease is around one half in some countries, such as Greece, Hungary and Portugal, whereas it is around 10% in certain Nordic and Baltic countries, Slovakia and Austria.

Disparities are generally much larger in respect to highest educational level attained (Figure III.1.9). Here, a high level of education is associated with frequent use of further informal learning. The highly educated are 2.4 times more likely to participate in informal learning - their participation rate rises to 66.6% - while it is just 28% for adults with at most lower secondary.

Such disparities are lowest in Norway, Sweden, Slovakia and Austria, which also had less extreme differences among age groups. The gap is much larger in some eastern and southern countries, such as Bulgaria, Greece, Hungary and Poland, where the most educated are 4.5 to 7 times more likely to participate in informal learning.

Particular ways of learning are more often utilized by low-educated adults, namely learning from family members, friends or colleagues and learning through television/radio/video. Computers and learning centres are apparently more difficult to access, and particularly the latter are mainly used by adults with tertiary education.

Figure III.1.8: Participation in informal learning by age (rates, 2007)

	Total	25-34	35-54	55-64
EU 22 countries	46.5	51.4	47.6	38.4
Belgium	34.9	42.4	36.5	25.3
Bulgaria	28.0	34.8	28.9	18.6
Czech Republic	54.7	59.4	55.9	47.7
Germany	52.4	53.8	54.3	45.7
Estonia	44.8	48.5	44.7	40.3
Greece	20.7	24.6	22.3	11.7
Spain	28.0	33.0	27.9	20.3
France	63.8	72.9	63.1	54.4
Italy	41.2	49.6	42.6	29.5
Cyprus	63.6	71.3	62.3	55.7
Latvia	53.9	55.8	54.0	51.5
Lithuania	45.3	53.4	46.5	30.9
Hungary	26.2	33.7	27.1	17.4
Netherlands	:	:	:	:
Austria	75.7	77.1	77.6	68.8
Poland	25.4	31.3	25.3	17.1
Portugal	38.9	50.6	38.0	25.8
Slovenia	62.0	72.1	62.1	50.1
Slovakia	84.1	87.6	83.7	79.9
Finland	54.6	61.0	55.1	47.8
Sweden	76.0	80.7	76.4	71.1
United Kingdom	53.7	56.3	55.8	46.1
Croatia	44.6	53.4	44.1	35.4
Norway	72.3	74.0	73.8	67.1

Source: Eurostat (AES)
Note: Data for Poland are not included in the EU average because of the very high non response rate.

Looking at labour market status, informal learning is more frequent among employed (51.1%) than unemployed (41.6%) or inactive adults (34%). The latter are one third less likely to improve their knowledge through informal learning. The geography of disadvantage is not different from what has been seen before: in Bulgaria, Greece, Hungary and Poland the gap reaches one half. In these countries the participation rate for inactive adults is very low, between 11% and 17%.

Countries with narrow gaps with respect to age and education levels exhibit the same tendency for labour market status. In those countries - as well as in Cyprus and Germany - the gap for inactive adults is less than one fifth.

Figure III.1.9: Participation in informal learning by educational attainment and labour status (rates. 2007)

	Total	Highest education level attained			Labour market status		
		Lower secondary	Upper secondary	Tertiary education	Employed	Unemployed	Inactive
EU 22 countries	46.5	28.0	49.3	66.6	51.1	41.6	34.0
Belgium	34.9	17.1	34.0	53.5	40.2	27.0	22.0
Bulgaria	28.0	10.1	24.6	54.9	33.6	15.3	16.5
Czech Republic	54.7	32.0	53.7	79.0	58.2	45.6	44.7
Germany	52.4	31.7	49.0	75.2	54.9	46.2	46.5
Estonia	44.8	29.9	40.4	57.5	47.2	25.5	37.8
Greece	20.7	9.2	20.6	41.0	24.1	21.6	10.8
Spain	28.0	18.3	31.2	42.2	30.4	26.2	20.6
France	63.8	44.7	65.8	85.3	68.5	59.8	49.2
Italy	41.2	26.3	51.2	67.9	47.5	38.8	28.1
Cyprus	63.6	50.8	63.8	75.4	64.9	55.9	60.2
Latvia	53.9	36.9	52.4	67.5	58.1	29.6	47.8
Lithuania	45.3	18.7	38.3	69.4	51.7	35.6	26.9
Hungary	26.2	10.2	24.5	55.4	33.6	14.1	13.8
Netherlands	:	:	:	:	:	:	:
Austria	75.7	60.7	76.6	89.5	78.9	67.0	68.1
Poland	25.4	7.7	20.3	55.5	31.0	19.5	13.9
Portugal	38.9	29.7	55.8	71.2	42.3	41.5	25.0
Slovenia	62.0	38.0	61.5	83.0	66.4	57.7	48.7
Slovakia	84.1	71.3	82.3	93.3	86.5	75.5	77.0
Finland	54.6	41.8	51.4	67.5	57.3	47.2	47.0
Sweden	76.0	60.8	76.9	87.5	78.1	66.2	69.8
United Kingdom	53.7	30.3	55.0	76.1	61.2	44.4	32.6
Croatia	44.6	23.2	47.5	76.6	52.7	36.8	31.4
Norway	72.3	60.1	70.0	85.7	75.5	63.0	59.2

Source: Eurostat (AES)
Note: Data for Poland are not included in the EU average because of the very high non response rate.

2. Key competences

2.1 Reading, mathematics and science literacy

European benchmark 2010
By 2010 the percentage of low-achieving 15-year-olds in reading literacy in the European Union should have decreased by at least 20% compared with 2000.

The European benchmark for 2010 implies that the share of low achievers in reading in the EU should decrease from 21.3% in 2000 to 17% in 2010. This benchmark derives from the PISA survey, which makes it possible to identify the share of pupils who have a low level of reading skills. The score on the PISA scale is divided into five levels. Pupils performing at level two are able to locate straightforward information, make low-level inferences of various types, work out what a well defined part of a text means and use some outside knowledge to understand it (PISA 2006). Pupils who fail to reach level two can therefore be considered to be inadequately prepared for the challenges of the knowledge society and for lifelong learning. The benchmark accordingly measures the share of pupils with reading literacy proficiency at level one or below.

Figure III.2.1 shows the development 2000-2009 regarding this benchmark. The average number of low achievers in the 18 EU countries with comparable data for the period 2000-2009 decreased to 20.0% in 2009. This means that over the period 2000-2009 as a whole a reduction equivalent to 6.1% of the rate has taken place, well short of the 20% reduction envisaged by the benchmark.

Figure III.2.1: Low achievers in reading and average score

	Low achievers in reading. %						Average score
	All				Boys	Girls	All
	2000	2003	2006	2009	2009	2009	2009
EU 18 countries	**21.3**	**:**	**24.1**	**20.0**	**26.6**	**13.4**	**493**
EU 25 countries	**:**	**:**	**23.1**	**19.6**	**25.9**	**13.3**	
Belgium	19.0	17.9	19.4	17.7	21.5	13.8	506
Bulgaria	40.3	:	51.1	41.0	52.0	29.1	429
Czech Republic	17.5	19.4	24.8	23.1	30.8	14.3	478
Denmark	17.9	16.5	16.0	15.2	19.0	11.5	495
Germany	22.6	22.3	20.0	18.5	24.0	12.6	497
Estonia	:	:	13.6	13.3	18.9	7.3	501
Ireland	11.0	11.0	12.1	17.2	23.1	11.3	496
Greece	24.4	25.2	27.7	21.3	29.7	13.2	483
Spain	16.3	21.1	25.7	19.6	24.4	14.6	481
France	15.2	17.5	21.7	19.8	25.7	14.2	496
Italy	18.9	23.9	26.4	21.0	28.9	12.7	486
Latvia	30.1	18.0	21.2	17.6	26.6	8.7	484
Lithuania	:	:	25.7	24.3	35.5	13.0	468
Luxembourg	(35.1)	22.7	22.9	26.0	32.9	19.1	472
Hungary	19.0	17.9	19.4	17.7	23.6	11.4	494
Netherlands	(9.5)	11.5	15.1	14.3	17.9	10.7	508
Austria	19.3	20.7	21.5	27.5	35.2	20.3	470
Poland	23.2	16.8	16.2	15.0	22.6	7.5	500
Portugal	26.3	22.0	24.9	17.6	24.7	10.8	489
Romania	41.3	:	53.5	40.4	50.7	30.4	424
Slovenia	:	:	16.5	21.2	31.3	10.7	483
Slovakia	:	24.9	27.8	22.3	32.0	12.5	477
Finland	7.0	5.7	4.8	8.1	13.0	3.2	536
Sweden	12.6	13.3	15.3	17.4	24.2	10.5	497
United Kingdom	(12.8)	:	19.0	18.4	23.1	14.0	494
Croatia	:	:	21.5	22.5	31.2	12.6	476
Iceland	14.5	18.5	20.5	16.8	23.8	9.9	500
MK*	:	:	:	:	:	:	:
Turkey	:	36.8	32.2	24.5	33.4	15.0	464
Liechtenstein	22.1	10.4	14.3	15.6	21.2	9.4	499
Norway	17.5	18.2	22.4	14.9	21.4	8.4	503
USA	17.9	19.4	:	17.7	21.4	13.6	500
Canada	9.6	9.6	11.0	10.3	14.5	6.0	524
Japan	10.1	19.0	18.4	13.6	18.9	7.9	520
Korea	5.8	6.8	5.7	5.8	8.8	2.5	539
Shanghai (China)	:	:	:	4.1	6.6	1.5	556

Source: OECD (PISA)
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Compared to OECD countries outside Europe, the EU has a relatively high share of low performers. With respect to trends both the USA and Japan showed a similar pattern to the EU with an increase in the share of low performers from 2000 to 2006, with improvement in the 2009 rate. The share of low performers in Korea, Canada and Australia was relatively stable at a level far below the EU 2010 benchmark of 17%.

Low achievers in basic skills: European benchmark 2020

In May 2009 the Council adopted a new benchmark for 2020 under which, in addition to reading, the share of low performers in mathematics and science should be reduced. The benchmark level for all three has been set to no higher than 15%.

European benchmark 2020
By 2020 the percentage of low-achieving 15-year-olds in reading, mathematics and science literacy in the European Union should be less than 15%.

Reading

As analysed above, progress since 2000 has been modest only. Meeting the new benchmark for 2020 will require a reduction in the rate by almost a quarter from the 2009 level.

There are large differences in performance between the Member States. Finland had only 8.1% of low performers (up from 7.0% in 2000 and 4.8% in 2006), followed by Estonia (13.3%) and the Netherlands (14.3%), countries that hence already perform better than the 15% benchmark. Poland (15.0%) and Denmark (15.2%) have results at or very close to the European benchmark. On the other side of the scale in Bulgaria and Romania more than 40% of the pupils were low performers in PISA 2009.

While performance deteriorated in many Member States from 2000 to 2006, in the period 2006-2009 a considerable number of countries showed significant improvements. Among the countries most successful in reducing the share of low achievers in reading in the period 2006-2009 were the two countries with the highest rates, Romania (-13.1 pp) and Bulgaria (-10.1 pp). Improvement was strong also in a range of countries which had seen a dip in performance in 2006, Portugal (-7.2 pp), Greece (-6.4 pp), Spain (-6.1 pp) and Italy (-5.4 pp). Countries where the share of low performers increased between 2006 and 2009 include Ireland (+5.1 pp), Luxembourg (+3.1 pp), Austria (+ 6 pp), Slovenia (+4.7 pp) and Finland (+3.3 pp).

As regards EFTA-EEA countries, Norway shows a relatively good performance with only 14.9% low performers in 2009, a 7.5 pp improvement from 2006. Iceland (16.8%) and Liechtenstein (15.6%) are also not far from the benchmark. Concerning candidate countries Croatia and Turkey perform below the EU average, but with strong improvements for Turkey since 2006.

In general, the performance gap between EU countries narrowed in 2009, with low performing countries catching up and some well-performing countries falling back.

Looking at performance across the reading scale, Finland is the leading country in Europe in terms of mean performance; it also has the smallest performance gap between pupils and schools. Estonia, Spain, Denmark and Slovenia have relatively small differences between top and low performers Bulgaria, the Czech Republic and Belgium have the largest performance gap among the Member States.

A large gender gap in performance remains and has even widened since 2006. The share of low achieving boys (25.9%) is about twice as high as the share of low achieving girls (13.3%). In Latvia and Lithuania the share of low performing boys is three times the share for girls, while in the leading performer, Finland, the rate for girls is exceptionally low at 3.2% but four times higher for boys. Across the EU as a whole, girls already meet the 15% benchmark for 2020; the challenge is bringing performance among boys down to a similar rate.

The worldwide comparison shows that Finland is one of the top performers among the participating OECD countries. Korea (5.8%) shows the lowest share of low achievers in reading of all OECD countries, while Japan (13.6%) and Canada (10.3%) also perform relatively well on this measure. The Chinese province of Shanghai (4.1%), which participated for the first time in the survey, shows the lowest share worldwide.

With respect to average reading scores, EU results (comparable data available for 16 EU countries) improved slightly between 2006 and 2009. Finland has the highest average score among the Member States with 536 points followed by the Netherlands (508), Belgium (507) and Estonia (501).

Since 2006 most Southern and South-Eastern European countries improved performance on the average score significantly. Norway and Turkey also improved performance strongly. Countries with a declining performance include Ireland, Austria, Luxembourg and Finland.

Japan (520) and the US (500) both scored above the EU average. Korea is the leading OECD country (539), while Shanghai (556) is the best performer world wide. 4 out of 5 top performing education systems in reading scores are located in East Asia (Shanghai, Korea, Hong Kong, Singapore). Canada, New Zealand and Australia, all of them countries with a relatively high share of migrants, do relatively well.

Mathematics

For mathematics, the average EU figure of low achievers was 22.2% in 2009 (Figure III.2.2). A reduction by almost one third will be needed for the EU to reach the 15% benchmark in 2020.

Figure III.2.2: Low achievers in mathematics and average scores

	% low achievers in mathematics				Average scores	
	All		Boys	Girls	All	
	2006	2009	2009	2009	2006	2009
EU 25 countries	**24.0**	**22.2**	**21.0**	**23.5**	497	497
Belgium	17.3	19.1	16.8	21.4	520	515
Bulgaria	53.3	47.1	48.2	45.9	413	428
Czech Republic	19.2	22.3	21.7	23.1	510	493
Denmark	13.6	17.1	14.7	19.4	513	503
Germany	19.9	18.6	17.2	20.2	504	513
Estonia	12.1	12.7	11.9	13.5	515	512
Ireland	16.4	20.8	20.6	21.0	501	487
Greece	32.3	30.3	28.4	32.1	459	466
Spain	24.7	23.7	21.4	26.1	480	483
France	22.3	22.5	21.6	23.4	496	497
Italy	32.8	24.9	23.5	26.4	462	483
Cyprus	:	:	:	:	:	:
Latvia	20.7	22.6	23.2	22.0	486	482
Lithuania	23.0	26.2	28.1	24.4	486	477
Luxembourg	22.8	23.9	22.2	25.7	490	489
Hungary	21.2	22.3	21.7	22.9	491	490
Malta	:	:	:	:	:	:
Netherlands	11.5	13.4	11.2	15.6	531	514
Austria	20.0	23.2	21.3	25.1	505	496
Poland	19.8	20.5	21.2	19.9	495	495
Portugal	30.7	23.7	22.6	24.7	466	487
Romania	52.7	47.0	46.9	47.2	415	427
Slovenia	17.7	20.3	20.9	19.7	504	501
Slovakia	20.9	21.0	21.4	20.7	492	497
Finland	6.0	7.8	8.1	7.5	548	541
Sweden	18.3	21.1	21.4	20.8	502	494
United Kingdom	19.8	20.2	17.5	22.8	495	492
Croatia	28.6	33.2	31.8	34.6	493	460
Iceland	16.8	17.0	17.9	16.1	506	507
MK*	:	:	:	:	:	:
Turkey	52.1	42.1	40.4	44.1	424	445
Liechtenstein	13.2	9.5	7.7	11.5	525	536
Norway	22.2	18.2	18.0	18.3	487	498
USA	28.1	23.4	20.6	26.3	489	487
Canada	10.8	11.5	10.9	12.1	527	527
Japan	13.0	12.5	12.9	12.0	531	529
Korea	8.8	8.1	9.1	7.0	547	546
Shanghai (China)	:	4.9	5.5	4.3	:	600

Source: OECD (PISA); average scores for 16 EU countries
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Finland has the smallest share of low performers in mathematics in the EU with only 7.8 %, followed by Estonia (12.7%) and the Netherlands (13.4%). However, in Romania and Bulgaria nearly half of the pupils fall into this category.

Finland is also the best performing country in the OECD in this measure, followed by Korea (9.1%) and Canada (11.5%). The US has a similar share of low performers in maths as the EU, while Japan has about ten percentage points less. Outside the OECD Hong Kong (8.7%) and Singapore (9.8%) are other good performers, while the Chinese region of Shanghai is the top performer worldwide (4.9%).

In most EU countries the share of low performing students in mathematics actually increased from 2006-2009. However, as a result of strong progress in a few member states, including Italy (-7.9pp), Portugal (-7.0pp), Bulgaria (-6.2pp) and Romania (-5.7pp) the overall EU results improved. In the group of candidate countries Turkey reports a significant decline in the share of low achievers (-10.0pp).

As regards average scores, Finland had the second highest mean score of all the OECD countries with 541, after Korea (546) points), the Netherlands (526), Belgium (515), Estonia (512), Germany, Denmark (503) and Slovenia (501). Outside the EU Liechtenstein (536) and Switzerland (534) had mean performance levels significantly higher than the OECD average performance level (which stands at 496). The EU average score remained unchanged between 2006 and 2009 (497 points). Given the overall fall in the share of low achievers this implies that differences between best and lowest performing pupils narrowed.

Romania (+12), Bulgaria (+15), Portugal (+19) and Italy (+19) were the EU countries where average scores improved most since 2006, while in Ireland (-14), the Netherlands (-17) and the Czech Republic (-17) they deteriorated most.

Estonia, Finland and Ireland have the lowest variance between high and low performing students. Austria, Germany, the Czech Republic and Belgium have relatively large differences between high and low performers.

In 2009 the average performance of the US was 10 points lower than for the EU. Japan performs significantly better than the EU. Other top performers include Korea (546), Hong Kong (555), Singapore (562) and Shanghai with an outstanding 600 score points.

Science

When it comes to science, the situation is better than for reading and mathematics, but will still require policy attention if the 2020 benchmark is to be met. The average share of low performers in science in the Member States was 17.7% in 2009 (Figure III.2.3). This implies that a decrease by 15 % in low performers is needed to reach the 2020 benchmark. An improvement of 12.8% was already achieved between 2006 and 2009.

Finland has the smallest share of low performing pupils in science within the EU with only 6.0%. Estonia (8.3%), Poland (13.1%), the Netherlands (13.2%), Hungary (14.1%), Slovenia (14.8%) and Germany (14.8%) also already perform better than the 2020 benchmark. In contrast more than 35% of pupils in Bulgaria and Romania are low performers in science.

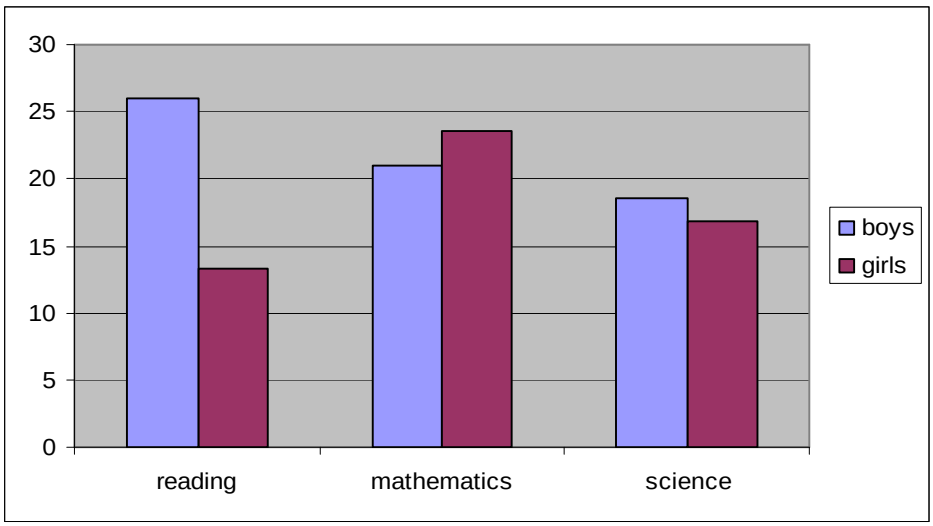
The EU countries that were most successful in reducing the share of low achievers in science include Portugal (-8.0pp), Romania (-5.5pp), Italy (-4.7 pp) and Bulgaria (-3.8 pp). Outside the EU the Candidate country Turkey (-16.6 pp) showed a strong improvement of performance.

The average OECD figure for low performers in science is 18.0%, close to the EU and the US average. The best performers in the OECD are Korea, Finland and Estonia. Japan is also among the good performers. With only 3.1% low achievers Shanghai scored best of all participating education systems.

The average score for the participating EU countries in science is 502 points, a slight improvement over 2006 (498 points). The best performing EU countries when it comes to average figures are Finland (554), Estonia (528), the Netherlands (522) and Germany (520). Worldwide, Finland ranks second, after Shanghai (575).

Gender gaps for science are smaller than for reading (where girls are clearly better) or for maths (where boys are slightly better), with girls slightly outperforming boys in science (Figure III.2.2a).

Figure III.2.2a: Low achievers in reading, maths and science by gender, 2009



Source: OECD (PISA)

Figure III.2.3: Low achievers in science and average scores

	Share of low achievers				Average scores	
	All		Boys	Girls	All	
	2006	2009	2009	2009	2006	2009
EU 25 countries	**20.3**	**17.7**	**18.6**	**16.8**	**498**	**502**
Belgium	17.0	18.0	17.9	18.2	510	507
Bulgaria	42.6	38.8	43.3	34.0	434	439
Czech Republic	15.5	17.3	17.9	16.5	513	500
Denmark	18.4	16.6	15.2	17.9	496	499
Germany	15.4	14.8	15.0	14.5	516	520
Estonia	7.7	8.3	8.6	8.1	531	528
Ireland	15.5	15.2	16.0	14.3	508	508
Greece	24.0	25.3	28.2	22.4	473	470
Spain	19.6	18.2	18.3	18.2	488	488
France	21.2	19.3	20.5	18.0	495	498
Italy	25.3	20.6	22.3	18.9	475	489
Cyprus	:	:	:	:	:	:
Latvia	17.4	14.7	16.8	12.6	490	494
Lithuania	20.3	17.0	20.0	14.0	488	491
Luxembourg	22.1	23.7	24.0	23.4	486	484
Hungary	15.0	14.1	15.3	12.9	504	503
Malta	:	:	:	:	:	:
Netherlands	13.0	13.2	12.3	14.0	525	522
Austria	16.3	:	21.6	20.3	511	494
Poland	17.0	13.1	15.5	10.8	498	508
Portugal	24.5	16.5	18.4	14.7	474	493
Romania	46.9	41.4	44.7	38.2	418	428
Slovenia	13.9	14.8	17.8	11.6	519	512
Slovakia	20.2	19.3	20.4	18.2	488	490
Finland	4.1	6.0	7.5	4.5	563	554
Sweden	16.4	19.1	20.3	17.9	503	495
United Kingdom	16.7	15.0	14.6	15.5	515	514
Croatia	17.0	18.5	20.5	16.3	493	486
Iceland	20.6	17.9	19.3	16.6	508	496
MK*	:	:	:	:	:	:
Turkey	46.6	30.0	33.3	26.5	424	454
Liechtenstein	12.9	11.3	9.2	13.7	522	
Norway	21.1	15.8	16.9	14.5	487	500
USA	24.4	18.1	17.0	19.3	489	502
Canada	10.0	9.6	9.9	9.2	534	529
Japan	12.0	10.7	13.1	8.1	531	539
Korea	11.2	6.3	7.5	5.0	522	538
Shanghai (China)	:	3.1	3.8	2.5	:	575

Source: OECD (PISA)
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

2.2 Language and intercultural competences: early and lifelong learning

The Barcelona European Council of 2002 set the objective for "the mastery of basic skills, in particular by teaching at least two foreign languages from a very early age" (Council 2002c, paragraph 44).

More recently, the ability "to enable citizens to communicate in two languages in addition to their mother tongue, promote language teaching, where relevant, in VET and for adult learners …" has been established as a priority area in the strategic framework for European cooperation in education and training, ET 2020.[53]

The Council has also invited the Commission to submit, by the end of 2012, a proposal for a possible benchmark in the area of languages based on the results of the ongoing work on the first European Survey on Language Competences.

At present, it is obligatory to learn at least one foreign language in compulsory education in all Member States (except Ireland and Scotland); a second foreign language is often optional.

[53] Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training ("ET 2020"). (http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2009:119:0002:0010:EN:PDF)

At ISCED 1, primary education level, the teaching of languages has become more common since 2000. Across the EU, the average number of foreign languages learned by pupils has increased from 0.5 in 2000 to 1.0 in 2008. Learning more than one language is common practice at primary level in Luxembourg (1.8 on average) and Greece (1.4) and to a lesser extent in Estonia and Sweden (1.1 in both countries), (see figure annex III. 6).

In 2008, more than half of second level pupils enrolled in general education in the EU were learning at least two foreign languages: 50.2% in lower secondary and 60.2% in upper secondary education. The longer-term trend is, however, unclear: from 2000 to 2006, the number of students learning at least two foreign languages in lower secondary education (ISCED 2) had increased, but was followed by a sharp decrease of more than 7% between 2006 and 2008. In upper secondary education (ISCED 3), the overall trend is similarly unclear (see figure III.2.4).

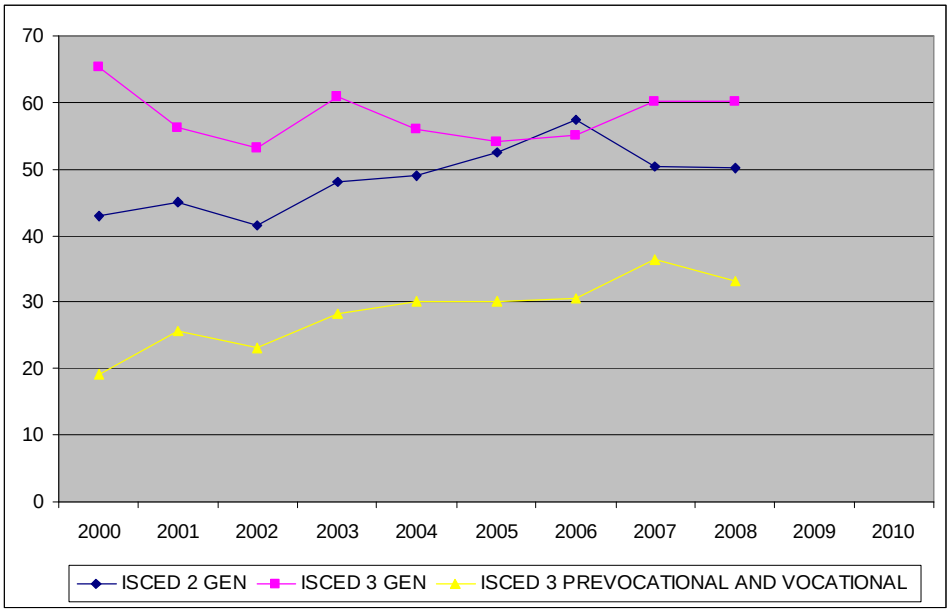
In lower secondary education, pupils learn on average more than two foreign languages in Luxembourg (2.5) and in Finland (2.2) and two in Estonia, Greece, Italy, Cyprus, the Netherlands and Romania. Students in Ireland, Hungary and the United Kingdom study the lowest number of languages, specifically 1.0 in each of the 3 countries (see figure annex III.7).

In upper secondary general education, more than two foreign languages are learnt by students in Luxembourg (3.0), Finland (2.7), the Netherlands (2.6), Belgium Flemish Community (2.5), Estonia (2.3) and in Sweden (2.2). The lowest number of foreign languages at this level is studied in the United Kingdom: only 0.6 per pupil lower than the level of language learning during the lower secondary phase.

In pre-vocational and vocational education (ISCED 3), the average number of foreign languages learned per pupil is considerably lower than in general secondary education. Nevertheless, the number of students learning at least two languages has grown over the decade to 2007, before falling in 2008 by 3.1 percentage points.

In prevocational and vocational upper secondary education, students learn on average two languages only in Luxembourg, 1.8 in Estonia, 1.6 in Poland and Romania, 1.5 in Belgium Flemish Community and in Bulgaria, followed by Italy and Slovakia (1.4) (see figure annex III.7).

Figure III.2.4: Percentage of pupils learning at least two foreign languages in EU, 2000-2008.



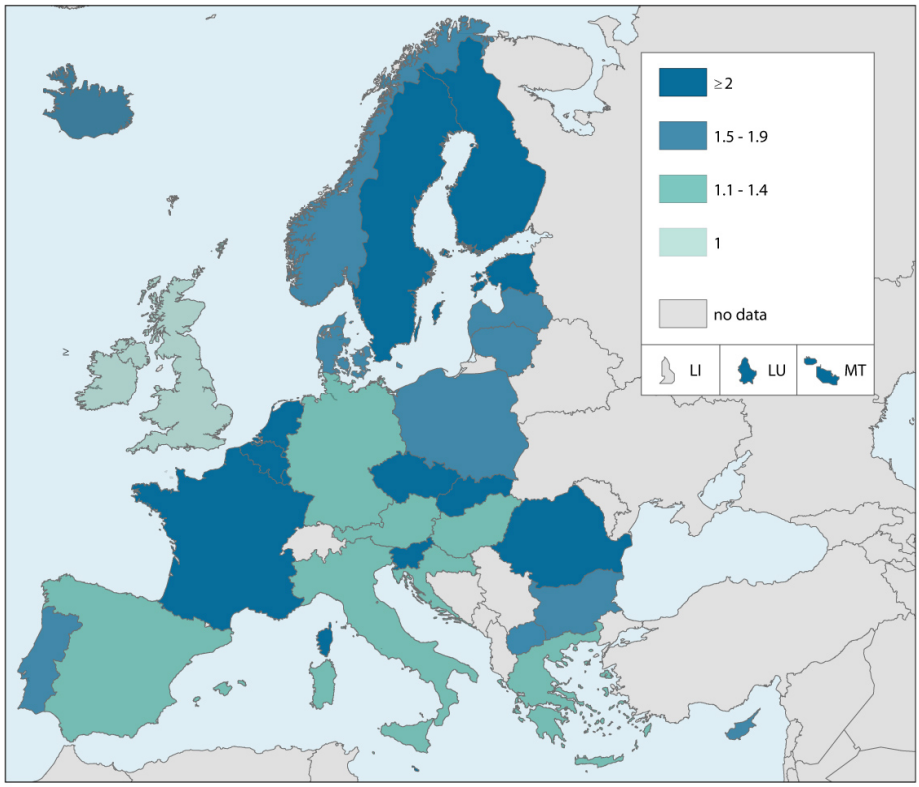
Source: Eurostat

Foreign language teaching is arranged in the following ways (EURYDICE. 2008):

Pupils in lower secondary education in all Member States have the possibility of learning a minimum of two foreign languages.

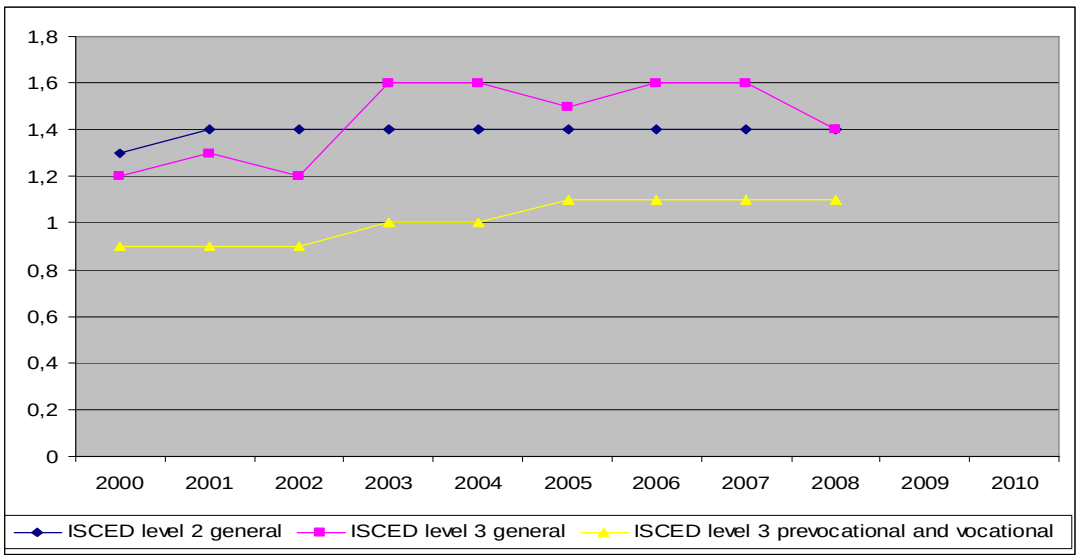
- Ø In primary and lower and upper secondary pupils *must* learn at least two foreign languages for at least a year of full-time compulsory education (FI, SE, EE, LV, LT, DK, NL, BE NL, LU, FR, PT, IS, HU, SK, BG, RO, EL, CY, LI).
- Ø The first foreign language is compulsory and pupils can learn the second for a year at least during full time compulsory education: NO, BE FR, BE, DE, ES, SI
- Ø Pupils *can* (DE, MT) and *must* (CZ, AT, PL) learn a minimum of two foreign languages from the beginning of upper secondary education.
- Ø Two foreign languages are not available to all pupils but may be offered within the flexible curriculum (UK, IE)

Figure III.2.5: Average number of languages learned per pupil in upper secondary education in 2008.



Source: Eurostat

Figure III.2.6: Average number of foreign languages learned per pupil in EU 2000-2008

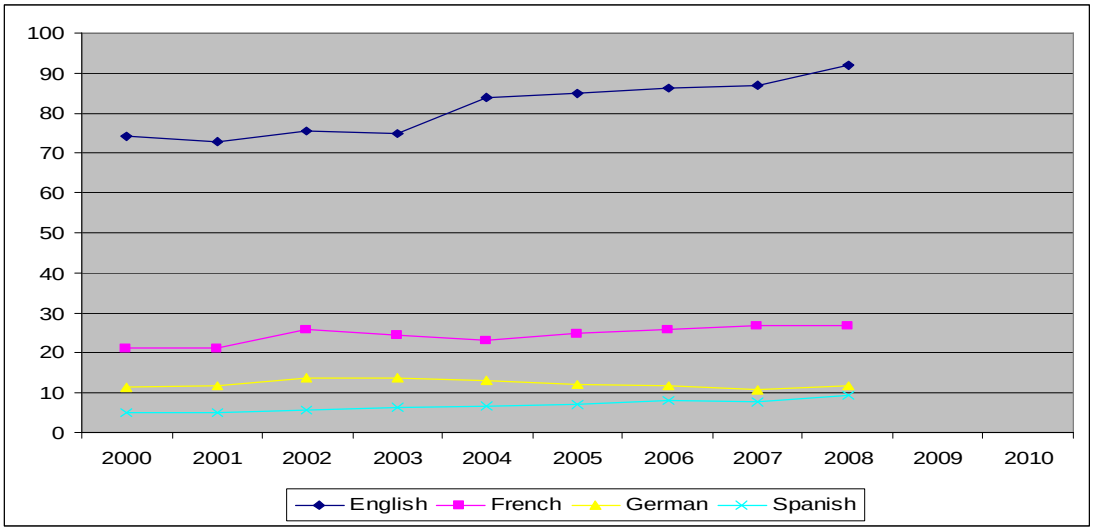


Source: Eurostat UOE
For notes see: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Foreign_language_learning_statistics

Since 2000, the biggest increase of the number of languages taught in lower secondary education took place in Italy (+0.9), in the Former Yugoslav Republic of Macedonia (0.5), in Slovenia (0.4) and in Hungary (0.3).

In upper secondary education in almost all EU countries the number of languages taught has increased significantly; most markedly in Belgium French speaking community (+0.8), Luxembourg (+0.8), Czech Republic (0.7), Romania (+ 0.7) and Slovakia (+ 0.6). (see figure annex III.7)

Figure III.2.7: Proportion of pupils learning English. French. German and Spanish as foreign language at ISCED level 2 in the EU (2000-2008)



Source: Eurostat

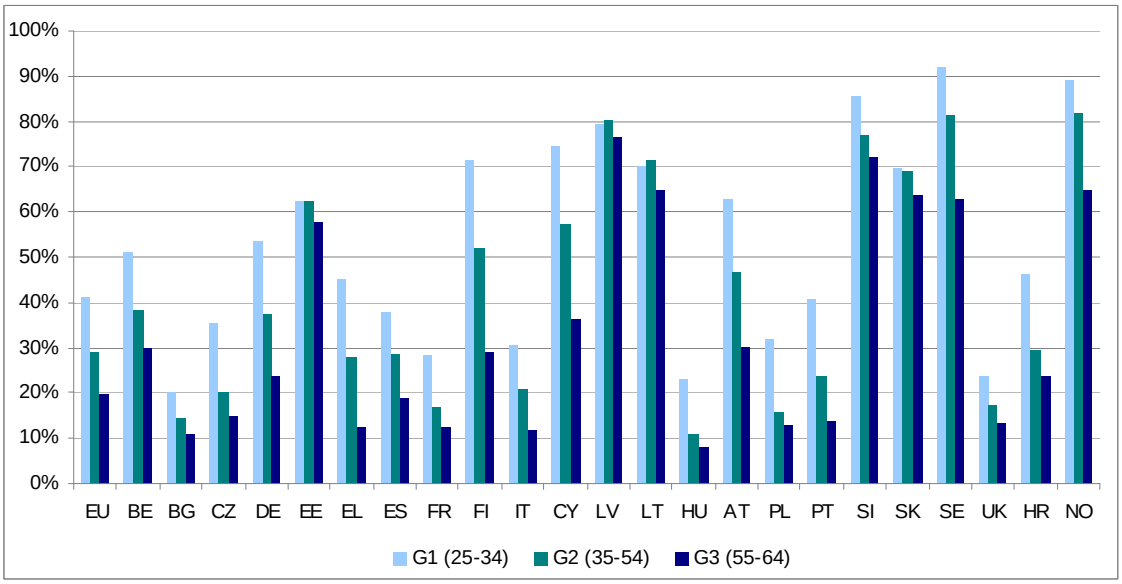
The proportion of pupils who learn English as a foreign language in lower secondary education increased from 74.3% in 2000 to 91.8% in 2008 (+ 5% from 2007 to 2008), sharply higher than the next most popular choices, French, German and Spanish. The relative increases for the learning of Spanish during the same period was high, but from a low base (see figure III.2.7 and figure annex III.8).

The language skills of the adult population

With respect to the language skills of the adult population, data collected in the language module of the Adult Education Survey (AES) in 2007 indicates that about 35% of the population in participating countries reports that it has no foreign language knowledge, another 35% report knowledge of one foreign language and slightly more than a quarter (28%) report knowledge of two or more foreign languages.

As shown in figure III.2.8, a consistent pattern across almost all countries which is apparent as a cascade effect from one generation to the next in the EU average, is that the youngest generation (25-34) reports a higher proficiency level of the best known foreign language than the older generations (35-54 and 55-64).

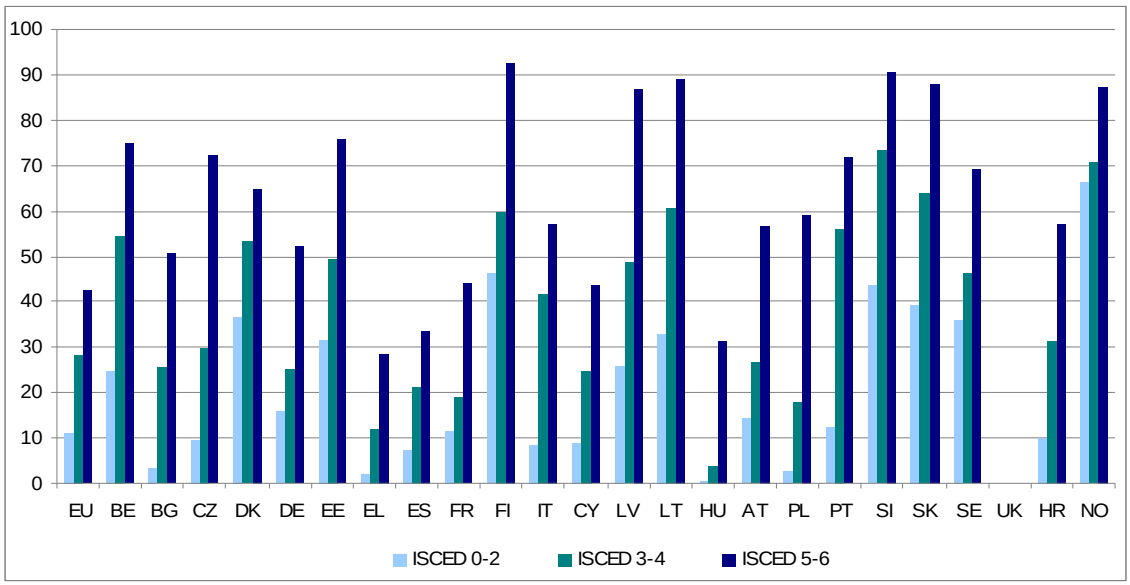
Figure III.2.8: Knowledge of the best known foreign language: share of cohort who report good or proficient levels of knowledge by age of the adult population (%), 2007



Source: Adult Education Survey 2007

Predictably, the higher the educational level of the adult population, the higher the knowledge of foreign languages. Figure III.2.9 shows a sharp difference in reported competence in two or more languages by ISCED level.

Figure III.2.9: Knowledge of two or more languages by ISCED level of the adult population (%), 2007



Source: Adult Education Survey 2007

2.3. ICT competences for young people and adults

The 'Digital Agenda for Europe' is one of the seven flagships of the Europe2020 strategy for smart, sustainable and inclusive growth. The overall aim of the 'Digital agenda' is to deliver sustainable economic and social benefits from a digital single market based on fast and ultra fast and interoperable applications (COM (2010) 245 final. p. 3). An adequate level of digital competences across the population is a prerequisite for this goal and this section focuses on the extent to which education systems are delivering this.[54]

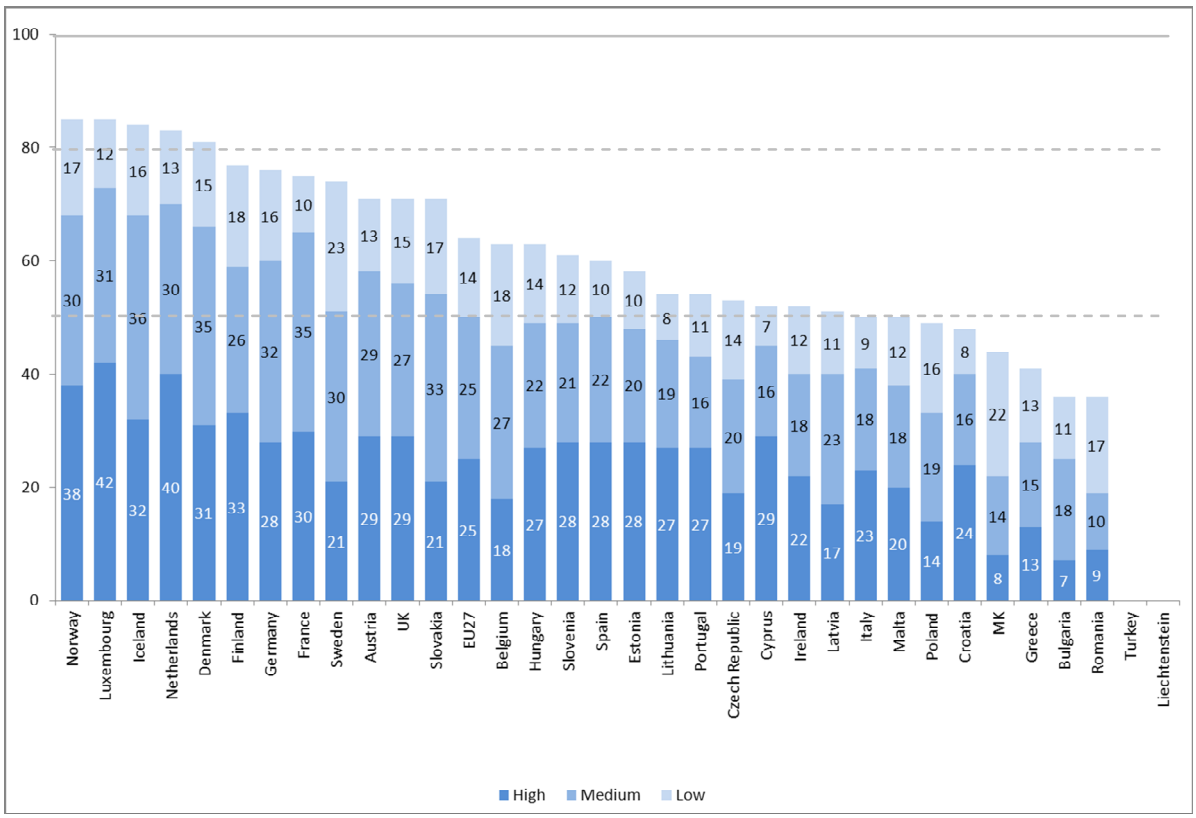
The 2010 Europe's Digital Competitiveness Report reveals that in Denmark, Luxembourg, the Netherlands, Norway and Iceland, over 80% of individuals aged 16 to 74 have some computer skills while, at the same time more than 50% of Greeks, Poles and more than 60% of Bulgarians and Romanians do not possess any computer skills (SEC(2010)627, p. 67).[55] On average, 64% of the European (EU27) population is computer skilled to some degree: 14% low skilled and 25% respectively with medium or high computer skills (Figure III.2.10).

Looking at the evolution of these rates between 2006 and 2009, the share of population which was found to be computer skilled increased in all countries except Sweden (-3.0%), Greece (-2.3%) and Germany (-1.2%). On average, the percentage of Europeans with some computer skills has increased by 3.9% per year. France shows the highest average annual increase (11.6%) followed by Romania, Portugal, Estonia and Bulgaria where the share of population with computer skills has grown by more than 6% per year. The percentage of population with computer skills has been increasing at a low rate of less than 2% in Belgium, the Czech Republic, Denmark, Malta, Slovenia, Slovakia, Finland and Norway.

[54] Digital competence involves the confident and critical use of Information Society Technology (IST) for work, leisure and communication. It is underpinned by basic skills in ICT: the use of computers to retrieve, access, store, produce, present and exchange information, and to communicate and participate in a collaborative network via the internet (COM (2005)548 final, p. 16).

[55] Digital skills are defined as having performed at least one of the following computer-related activities: coping or moving a file or folder, using coping and paste tools to duplicate or move information within a document, using basic arithmetic formulas in a spreadsheet, compressing (or zipping files), connecting and installing new devices, writing a computer programme using a specialized programming language. Low skills refers to being able to do one or two of these computer-related activities, medium skills refers to being able to do three or four of these activities, and high skills five or all of them.

Figure III.2.10: Level of computer skills in Europe, 2009
Percentage of individuals aged 16 to 74 with low. medium and high computer skills



Source: Eurostat. Information Society Statistics (data extraction: July 2010).

The level of computer skills differs not only among European countries but also according to different population characteristics within countries: there are significant disparities between genders, age-groups and levels of education (Figure annex III.10, 11 and 12).

The percentage of Europeans with some computer skills has been increasing since 2006 both for males and females but the share of individuals that declare to have a high level of computer skills remains higher among males than among females.

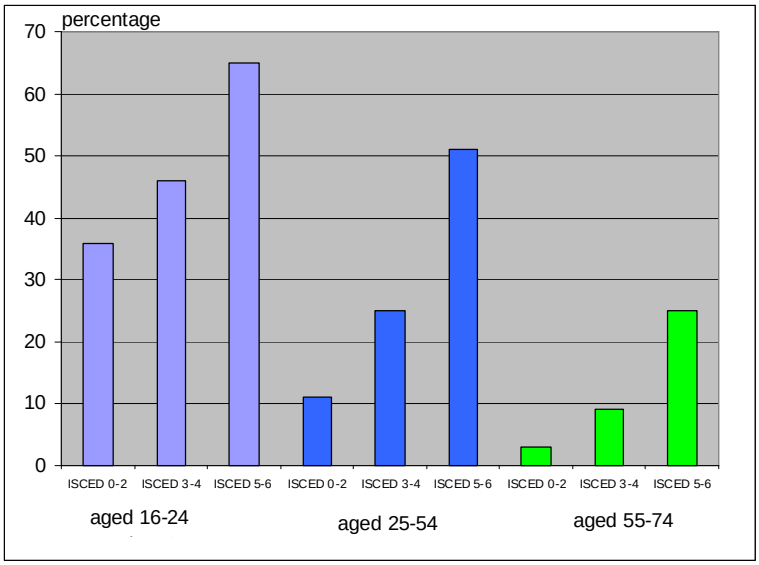
Young people (individuals aged 16 to 24) tend to have computer skills well above the European average, individuals aged 25 to 55 have digital computer skill levels around the average, and the majority of the people aged 56-74 lack computer skills. The percentage of individuals with some computer skills has increased for all the age-groups between the years 2006 and 2009.

Computer skills are positively correlated with the educational attainment in all the age-groups and the impact of the educational attainment level on skills is highest in the 25-54 age-group – the difference in skills between lowest and highest attainment levels is 18 percentage points in the 16-24 age group, 51 percentage points in the 25-54 age group, and 46 percentage points in the 55-74 age group. See Figure III.2.11.

Regarding internet skills, data collected in 2007 shows a high correlation with digital (computer) skills data.[56] Therefore, we can assume that the distribution pattern and the variation rates of these two variables are similar also in 2009.

[56] In 2007, the correlation between the total amount of computer and internet skills is higher than 0.99 and, considering each skill level separately, it is more than 0.94.

Figure III.2.11: Computer skills by age-group and educational attainment, 2009
Percentage of individuals in each age-group with high computer skills



Source: Eurostat. Information Society Statistics (July 2010).

Europeans' level of computer skills, even though increasing, is still low compared to the requirements of the labour market. On average, only one third of the people aged 16 to 74 assesses that they have a level of computer skills sufficient to look for a job or change a job within a year (ranging from 14% in Romania to 44% in Norway). At the same time, almost 50% of enterprises (ranging from 31% in the United Kingdom to the 61% in the Netherlands) recruiting IT specialists report that they find it hard to fill open positions mainly because of lack of digital competences among applicants.[57]

Education and training systems have a key role in reducing this mismatch. However, at the present only limited data are available on their impact on young and adults' digital competences.[58] Two international research initiatives aiming at reducing this data-gap have been recently launched. The first one, the IEA's *International Computer and Information Literacy Study* (ICILS), will examine the contribution of in-school and out-of school learning on students' computer and information literacy (CIL), between and within countries (See figure III. 2.12).

Figure III.2.12: ICILS in brief

IEA's International Computer and Information Literacy Study (ICLS)

ICILS will examine the outcomes of student computer and information literacy (CIL) education across countries; it will investigate the variation in CIL outcomes between countries, and between schools within countries, so that those variations can be related to the way CIL education is provided.

Computer and Information Literacy
The following definition of CIL is the bases of the proposed study:
Computer and information literacy refers to an individual's ability to use computers to investigate, create and communicate in order to participate affectively at home, at school, in the workplace and in the community

Assessment methodology
The assessment of CIL will be authentic and computer-based. It will incorporate three types of item (or tasks): 1) multiple-choice or constructed response items based on realistic stimulus material; 2) software simulations of generic applications; and 3) authentic tasks.

Target population
In most countries, the main population to be surveyed will include eight grade students and teachers teaching at least one class in the target grade.

Timeframe: the project's final report will be delivered by November 2014.

Research web-site: http://forms.acer.edu.au/icils/index.html

[57] Eurostat (Information Society Statistics, 2007) and Didiero, M. et al. (2009) *Monitoring e-skills demand and supply in Europe*, Bonn, DE: Empirica (www.eskills-monitor.eu/documents/Synthesis%20ReportMeSkills_final.pdf).

[58] See, for example: Pelgrum, W.J., (2009). *Study on indicators of ICT in primary and secondary education (IIPSE)*. Luxembourg: European Commission; OECD, JRC-EC, (2010). *Assessing the effects of ICT in Education. Indicators, criteria and benchmarks for International comparisons*. Luxembourg: European Commission; OECD-CERI, (2010). *Are the new millennium learners making the grade? Technology use and educational performance in PISA*. Paris: OECD.

The second one, the OECD's *Programme for the International Assessment of Adult Competences* (PIAAC), will provide a range of internationally comparable data concerning adults' familiarity and proficiency in using the new technologies in and outside the work environment (See figure III. 2.13).

Figure III.2.13: PIAAC in brief

OECD's Programme for the International Assessment of Adult Competences (PIAAC)

PIAAC will assess the level and the distribution of key cognitive and workplace skills among the adult population (i.e. reading literacy, numeracy, and problem-solving in technology-reach environments)

Literacy
The core of PIAAC is the assessment of adults' literacy skills, understood as the interest, attitude and ability of individuals to appropriately use socio-cultural tools, including digital technology and communication tools, to access, manage, integrate and evaluate information, construct new knowledge, and communicate with others.

Assessment methodology
The assessment will normally be computer-based; those respondents who report or demonstrate to not to be able to use a computer will have the possibility to take a paper-pencil assessment.

Target population
Adults aged 16 to 65 – 5000 in each participating country

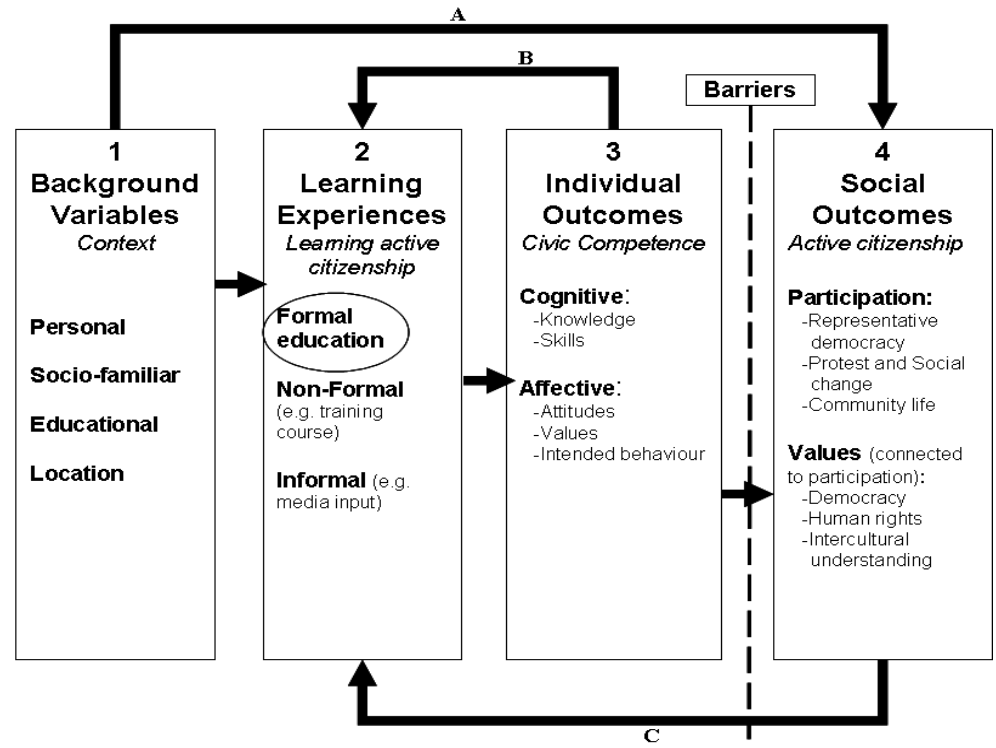
Timeframe: the project's final report will be delivered by September 2013.

Research web-site: http://www.oecd.org/document/35/0,3343,en_2649_201185_40277475_1_1_1_1,00.html

2.4 Civic competences

The eight Key Competences for Lifelong Learning agreed by the Council and European Parliament in 2006 include social and civic competences.[59] Civic competence covers "particularly knowledge of social and political concepts and structures (democracy, justice, equality, citizenship and civil rights) and equips individuals to engage in active and democratic participation". Research has in recent years taken place to develop an indicator to measure the role of education in building civic competences and active citizenship by CRELL at the JRC (see figure III.2.14).

Figure III.2.14: Measuring Civic competence and Active Citizenship working model developed by CRELL



Source: CRELL

The working definition of active citizenship which has been used within this research is 'Participation in civil society, community and/or political life, characterised by mutual respect and non-violence and in accordance with

[59] Skills for civic competence relate to the ability to engage effectively with others in the public domain, and to display solidarity and interest in solving problems affecting the local and wider community. This involves critical and creative reflection and constructive participation in community or neighbourhood activities as well as decision-making at all levels, from local to national and European level, in particular through voting.

human rights and democracy' (Hoskins. 2006b). Two composite indicators have been developed – one on civic competences of pupils and one on active citizenship (actions) of adults. The civic skills composite indicator was based on the 1999 IEA CIVED survey and development of another similar indicator began in 2010 using the results of the 2009 International Civic and Citizenship Education Study (ICCS).

The IEA 2009 International Civic and Citizenship education Study (ICCS)

38 education systems participated in the ICCS study carried out by the IEA (International Association for the Evaluation of Educational Achievement). The civic skills tests for this study took place in 2008/2009. 140 000 grade 8 students (about 14 years old) were tested on their civic knowledge and attitudes. Additional background information was collected via pupil, teacher and school questionnaires. In addition the IEA compiled system level information.

Within Europe 22 EU countries (all EU Member States except France, Germany, Hungary, Portugal and Romania) plus the EFTA-EEA Norway and Liechtenstein, as well as Russia and Switzerland participated. Participating EU countries plus Switzerland and Liechtenstein furthermore implemented a specific European module within the survey. In 1999 a similar study (CIVED) had been carried out by the IEA and hence some items which featured in both surveys can be compared.

Key results

The study found that pupils from Finland, Denmark, Korea and Chinese Taipei (Taiwan) showed the strongest results in citizenship education (national average scores for civic knowledge figure III.2.15). Other EU countries with relatively high scores (> 530 score points) were Sweden, Poland and Ireland. 15 of the 22 participating EU countries scored above the 500 points scale average. EU countries scoring below the international average were Malta, Latvia, Greece, Luxembourg, Bulgaria and Cyprus (in addition the Netherlands had low scores, but the survey in this country did not meet the sampling requirements). Cyprus had the lowest scores of all EU countries participating in the survey.

The impact of school education on citizenship outcomes is still under discussion between researchers. The IEA concluded from the results of the study that the fact that pupils in varied cultures and environments scored at broadly similar high levels suggested that school education played an important role and added significantly to what students learn from living in their society. The study also showed that in almost all countries girls' outperformed boys in their knowledge and understanding of civics.

In 15 countries for which comparative data were available, because they had participated in the 1999 CIVED study, there was a significant decline in civic knowledge over the last decade. Among these are the EU countries Greece, Poland, Slovakia, the Czech Republic and Bulgaria. Only one country (Slovenia) showed a statistically significant increase in performance since 1999.

Key findings of the European report of the ICCS 2009 study

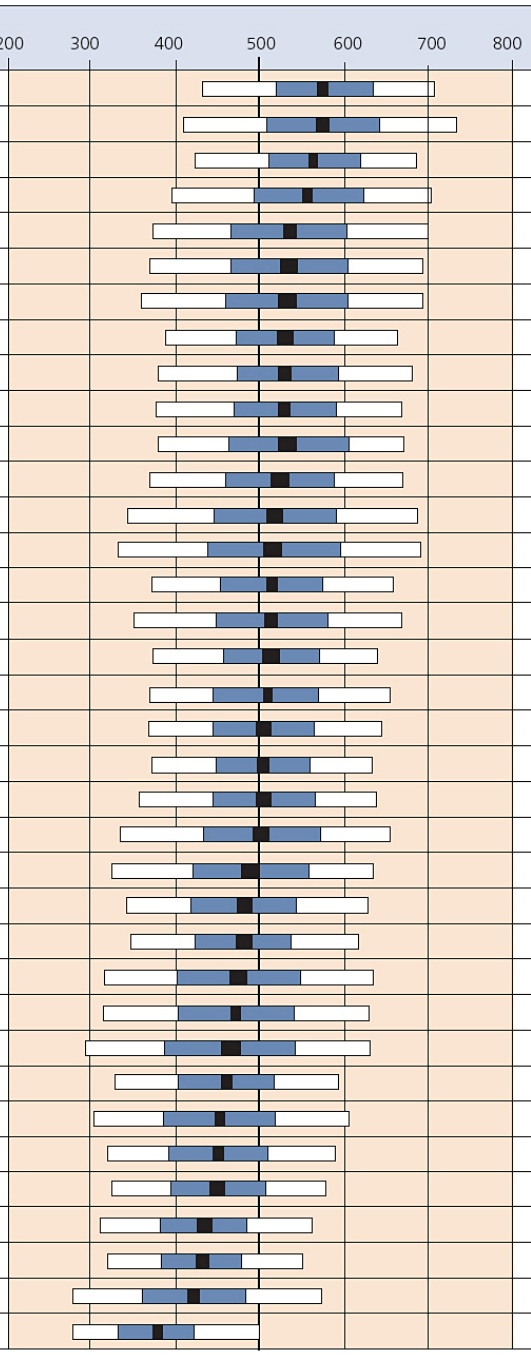
Knowledge about the European Union

The European module data show that knowledge about the European Union is relatively good in EU countries (Figure III.2.16), but there is still a clear need for improvement. In all participating EU countries more than 95% of pupils knew that their country was an EU member state. Over 90% of pupils knew the flag of the European Union and 85% understood that it is an economic and political partnership between countries. The majority of pupils furthermore knew where the European Parliament meets, how many countries were EU member states and whether people got new political rights when their country joins the EU. Test items that were answered correctly by less than half of pupils include the requirements for countries to be allowed to join the EU, who votes to elect Members of the European Parliament and what determined how much each member country contributes to the EU.

Overall the pupils in Slovakia and Poland showed the best knowledge about the EU (> 70% of 10 questions answered correctly), while pupils in UK-England showed the lowest level of knowledge (52%), performing below non-EU members Liechtenstein and Switzerland).

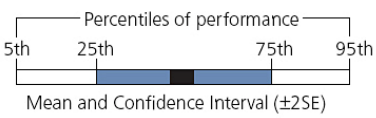
Figure III.2.15: National average for civic knowledge of 8th grade pupils

Country	Civic Knowledge				
	Years of schooling	Average age	Average scale score		
Finland	8	14.7	576	(2.4)	▲
Denmark †	8	14.9	576	(3.6)	▲
Korea, Republic of[1]	8	14.7	565	(1.9)	▲
Chinese Taipei	8	14.2	559	(2.4)	▲
Sweden	8	14.8	537	(3.1)	▲
Poland	8	14.9	536	(4.7)	▲
Ireland	8	14.3	534	(4.6)	▲
Switzerland †	8	14.7	531	(3.8)	▲
Liechtenstein	8	14.8	531	(3.3)	▲
Italy	8	13.8	531	(3.3)	▲
Slovak Republic[2]	8	14.4	529	(4.5)	▲
Estonia	8	15.0	525	(4.5)	▲
England ‡	9	14.0	519	(4.4)	▲
New Zealand †	9	14.0	517	(5.0)	▲
Slovenia	8	13.7	516	(2.7)	▲
Norway †	8	13.7	515	(3.4)	▲
Belgium (Flemish) †	8	13.9	514	(4.7)	▲
Czech Republic †	8	14.4	510	(2.4)	▲
Russian Federation	8	14.7	506	(3.8)	
Lithuania	8	14.7	505	(2.8)	
Spain	8	14.1	505	(4.1)	
Austria	8	14.4	503	(4.0)	
Malta	9	13.9	490	(4.5)	▼
Chile	8	14.2	483	(3.5)	▼
Latvia	8	14.8	482	(4.0)	▼
Greece	8	13.7	476	(4.4)	▼
Luxembourg	8	14.6	473	(2.2)	▼
Bulgaria	8	14.7	466	(5.0)	▼
Colombia	8	14.4	462	(2.9)	▼
Cyprus	8	13.9	453	(2.4)	▼
Mexico	8	14.1	452	(2.8)	▼
Thailand †	8	14.4	452	(3.7)	▼
Guatemala[1]	8	15.5	435	(3.8)	▼
Indonesia	8	14.3	433	(3.4)	▼
Paraguay[1]	9	14.9	424	(3.4)	▼
Dominican Republic	8	14.8	380	(2.4)	▼



Countries not meeting sample requirements

Hong Kong SAR	8	14.3	554	(5.7)	
Netherlands	8	14.3	494	(7.6)	



▲ Achievement significantly higher than the ICCS average

▼ Achievement significantly lower than the ICCS average

Notes:

( ) Standard errors appear in parentheses.

† Met guidelines for sampling participation rates only after replacement schools were included.

‡ Nearly satisfied guidelines for sample participation only after replacement schools were included.

[1] Country surveyed the same cohort of students but at the beginning of the next school year.

[2] National Desired Population does not cover all of International Desired Population.

Source: IEA. International report, June 2010

Figure III.2.16: National percentages of correct responses for test items about the European Union

	Country is a member of the EU	The EU is an econom. and political partner-ship between countries	People get new political rights when their country joins the EU	What is the flag of the European Union?	How many countries are EU member states?	What is one require-ment for a country to be allowed to join the EU?	Which of the following cities is a meeting place for the European Parliament	Who votes to elect Members of the European Parlia-ment?	The Euro is the official currency of all countries in Europe
European av.	**97**	**85**	**65**	**93**	**57**	**40**	**66**	**35**	**69**
Belgium-Fl	100	91	59	92	61	47	76	37	53
Bulgaria	99	91	74	98	66	28	73	41	64
Czech Republic	99	86	64	97	71	32	83	25	86
Denmark	99	93	54	85	50	60	62	26	80
Estonia	99	90	72	99	50	27	68	33	80
Ireland	99	88	68	87	56	33	59	49	69
Greece	98	76	69	95	56	42	74	28	66
Spain	99	82	60	97	49	38	48	35	53
Italy	99	81	60	97	62	34	75	44	71
Cyprus	98	76	85	98	71	57	74	21	56
Latvia	97	86	66	98	52	36	63	29	70
Lithuania	99	87	71	98	60	39	59	27	68
Luxembourg	99	71	71	96	63	39	64	36	51
Malta	99	79	74	97	54	50	72	44	57
Netherlands	(99)	(88)	(67)	(92)	(44)	(42)	(63)	(40)	60
Austria	98	74	68	96	67	37	77	39	60
Poland	99	89	65	99	55	55	87	38	86
Slovenia	99	85	63	99	70	33	83	26	62
Slovakia	99	90	49	99	75	42	88	68	84
Finland	99	89	59	97	45	30	60	33	83
Sweden	97	83	68	76	50	58	51	37	71
UK (England)	96	86	56	66	35	37	22	45	72
Liechtenstein	75	88	60	90	46	36	53	23	77
Switzerland	79	89	66	90	47	40	50	23	77

Source: IEA (ICCS 2009). The survey for the Netherlands didn't meet the sampling requirements
The European average is the arithmetic average of countries participating in the European module.

Values and attitudes

Most pupils endorsed democratic values, gender equality and equal rights for ethnic or racial groups and immigrants, as well as the freedom of movement of citizens within Europe. Large majorities of pupils in Europe (70%) stated they had a strong sense of European identity (figure III.2.17). In Italy, Spain and Slovakia more than 80% of pupils stated that they feel part of the European Union. The lowest rates were found in Sweden (50%), Latvia (54%) and UK-England (56%). Most pupils (86%) in EU countries also expressed pride in the fact that their country was an EU member with the highest shares in Italy and Ireland and the lowest shares in Latvia and Malta.

In general, pupils were more interested in domestic political and social issues (49%) and in issues within the local community (40%) than in European (38%) or international politics (33%) or in politics in other countries (26%).

Figure III.2.17: National percentages of responses on values and attitudes

	I feel part of the European Union	I am proud that my country is a member of the EU	I see myself as a European	I see myself firs as a citizen of Europe and then as a citizen of my country	Citizens of European countries should be allowed to live and work anywhere in Europe	Students reporting being very or quite interested in		
						Political issues with their local community	Political issues in their country	European politics
European av.	**70**	**86**	**91**	**37**	**90**	**40**	**49**	**38**
Belgium-Fl	63	88	91	27	80	31	30	24
Bulgaria	71	88	86	44	95	46	51	47
Czech Republic	61	79	92	37	95	33	43	25
Denmark	66	84	92	29	82	38	34	29
Estonia	72	87	90	31	96	47	50	41
Ireland	75	93	90	47	85	42	56	35
Greece	75	87	91	32	91	46	52	47
Spain	83	91	93	44	94	44	52	38
Italy	90	95	97	47	93	59	71	55
Cyprus	73	85	88	53	91	37	43	40
Latvia	54	73	81	39	92	35	64	42
Lithuania	64	91	94	32	95	41	70	52
Luxembourg	73	88	93	45	90	36	52	45
Malta	71	77	86	37	89	39	54	35
Netherlands	(40)	(81)	(88)	(20)	(79)	(31)	(33)	(23)
Austria	76	80	92	31	88	62	62	50
Poland	71	87	92	25	95	45	54	40
Slovenia	75	91	96	37	92	24	33	31
Slovakia	81	91	97	37	97	31	40	35
Finland	63	89	97	43	90	21	29	25
Sweden	50	81	87	39	86	29	35	24
UK (England)	56	81	82	50	80	39	51	31
Liechtenstein	-	-	96	26	82	43	49	37
Switzerland	-	-	87	28	81	44	57	41

Source: IEA (ICCS 2009). The survey for the Netherlands didn't meet the sampling requirements
The European average is the arithmetic average of countries participating in the European module.

Participation in Europe related activities

34% of pupils in the study have participated in activities organized in the local area that involve meeting people from other European countries (Estonia and Cyprus showing the highest rates), 30% participated in friendship agreements (twinning) between local town/city and other European towns or cities (highest rates in Cyprus and Slovenia), 45% in exhibitions, festivals or other events about the culture of other European countries (highest rates in Luxembourg and Estonia) (Figure III.2.18).

Figure III.2.18: National percentages of students' participation in activities or groups relating to Europe

	Percentages of students reporting having participated in:		
	Activities organized in local area that involve meeting people from other European countries	Activities related to friendship agreements (twinning) between local/town/city and other European towns/cities	Exhibitions, festivals, or other events about the art and culture (e.g. music films) of other European countries
European average	**34**	**30**	**45**
Belgium-Fl	32	28	47
Bulgaria	32	26	28
Czech Republic	27	27	38
Denmark	31	17	53
Estonia	46	32	57
Ireland	29	34	47
Greece	36	35	45
Spain	38	38	49
Italy	33	28	45
Cyprus	43	43	45
Latvia	23	27	44
Lithuania	37	37	42
Luxembourg	40	30	62
Malta	32	29	50
Netherlands	(45)	(17)	(46)
Austria	36	27	46
Poland	41	29	42
Slovenia	37	39	46
Slovakia	30	24	45
Finland	29	28	50
Sweden	31	27	43
UK (England)	28	32	44
Liechtenstein	47	19	59
Switzerland	30	20	52

Source: IEA (ICCS 2009). The survey for the Netherlands didn't meet the sampling requirements
The European average is the arithmetic average of countries participating in the European module

Research available so far does not allow making a direct link between the civic competences of pupils and their civic behaviour as adults. Further studies, including longitudinal ones, are needed to understand this relationship better. However, linking data on formal educational levels with data on civic behaviour can provide some insights.

Impact of formal education on civic behaviour of adults

The CRELL research centre has measured the impact of years of formal education on active citizenship of adults (Hoskins, D'Hombres and Campbell, 2008). The results suggest that there is a significant return in terms of increased democratic participation and other measures of active citizenship behaviour associated with formal education. Tertiary education has by far the biggest effect. However, it is difficult to say for sure that this correlation is causal: many variables have been controlled for, but there could be other factors involved. A study by Elchardus and Spruyt (2007) in Belgium (Fl) highlighted that it may not actually be the learning experience of tertiary education but the access to it that creates the positive identity of active citizens and that a lack of access to higher education might be associated with negative attitudes, identity and behaviour.

3. Gender inequalities

Gender inequalities are widespread within education, in the form of different disadvantages and gendered patterns of participation and performance, sometimes to the disadvantage of males and sometimes to the disadvantage of females.

Educational systems are important forces to foster gender equality by providing equal opportunities for participation, combating gender driven performance patterns and providing textbooks and course content which counteract gender stereotypes. Focusing on education for gender equality also involves looking at the gender balance among education professionals: the teaching profession is much feminized at lower educational levels, predominantly masculine with respect to management positions and at the highest educational levels (NESSE. 2009; Stromquist and Fischman. 2009; Eurydice. 2010).

This section addresses relevant issues with particular reference to the different difficulties faced by young male and female students in the school system, to gender-driven educational choices and to teaching staff characteristics.

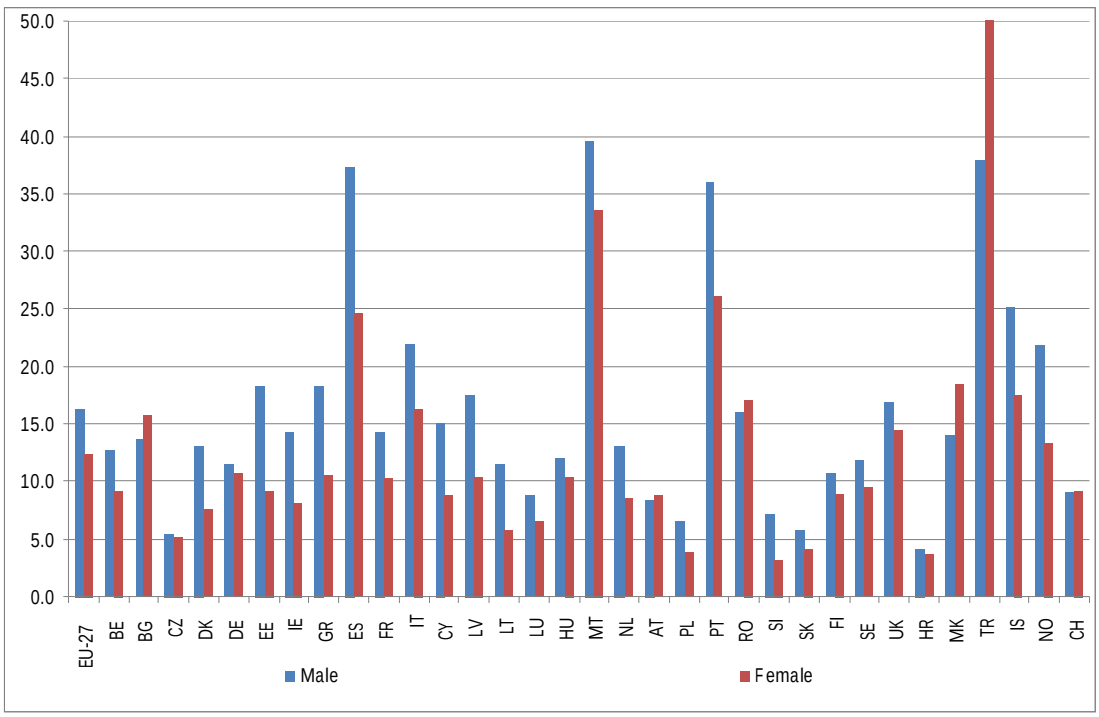
3.1 Differentials in schooling

While differentials in de jure access to education are no longer an issue in EU Member States, clear differences persist in terms of performance and expectations.

Early leavers from education and training

As discussed above at Section 1.2, males and females continue to differ in respect to early school leaving and the pattern does not appear to be changing. While the overall early leaving rate is slowly decreasing young males remain more likely to be early leavers from education and training: in 2009 the percentage for males was 16.3% while for females it was 12.5% (Figure III.3.1).

Figure III.3.1: Early leavers from education and training by gender. 2009 (%)



Source: Eurostat. LFS
Notes: Data for Luxembourg. Slovenia and Croatia lacks reliability due to small sample size.
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

This general pattern is evident in almost all countries. Figures for the EU-27 reveal that in 2009 the exceptions are only Bulgaria, Austria and Romania. Among non-Member States covered, the rate for females also exceeds that for males in Turkey (50.2% females and 37.9% males) and The former Yugoslav Republic of Macedonia, where the proportion of females (18.5%) is 4.4 percentage points higher than that for males.

The ratios for males are notably higher in several countries across different geographical regions: among Baltic states Estonia and Latvia (between 7 and 8 points); in Southern Europe for Greece, Spain and Portugal (more than 7 points); and in respect to the Northernmost countries, Iceland and Norway (about 8 points).

Gender differences in basic skills: evidence from international surveys

Looking at the results of international student assessments such as PIRLS, TIMSS and PISA, they show that patterns of performance in basic skills differ by gender, but the nature and direction of the difference vary with the subject matter.

Among students in the fourth grade, girls have higher attainment levels than boys in reading in all EU participating countries (Millis et al. 2007). The same pattern holds for 15-year-old students, covered by PISA, with the percentage of low achievers being almost twice as high for boys (25.9 %) compared to girls (13.3%) (see figure III. 2.1).

A partial explanation of these disparities can be found in cultural patterns, as evidence suggests that reading is generally considered a more feminine activity, especially for students with a working class background (European Commission - NESSE. 2009). Also students' attitudes play an important role: in all countries males are less interested in reading than females and often read only if they have to, as shown by responses to PISA survey items with 46% of males vs. 26% of females in OECD countries falling into this category (OECD. 2009).

As for mathematics, the overall gender difference is less pronounced and results are not clear-cut. TIMSS showed that in 2006 male fourth graders outperformed their female counterparts in most European countries, but at the eighth grade level there were no gender differences in most countries. In 4 countries girls had higher scores than boys (Eurydice. 2010).

Considering expectations and attitudes regarding the study of mathematics, female students usually face greater difficulties: even though they consider it important to do well in this subject, their level of enjoyment, interest and motivation is lower and they are generally more anxious and stressed during lessons (OECD. 2009).

Looking at performance in science, gender differences are quite small or even non-significant in the majority of countries. Nevertheless, there are remarkable differences across the dimensions tested by PISA 2006, e.g. males outperform females when the task involves explaining phenomena scientifically but perform worse when the main content of the test implies identifying scientific issues. These findings would argue for adoption of a gendered-learning approach, referred to earlier in the introduction. The broad overall gender equality in performance reflects the fact that boys and girls show broadly similar attitudes, motivations and confidence regarding this subject matter (OECD. 2009).

There is a lack of agreement on how to effectively address gender differences so that both females and males may fully develop their individual potential. However, the performance gaps in basic skills such as reading and mathematics call for a focused effort to foster equality of outcomes which will in turn raise overall performance levels.

3.2 Educational choices

General and vocational education

On average, in the EU, students in upper secondary education are almost equally distributed between general and vocational/pre-vocational programmes, but the gender imbalance is pronounced, with a clear prevalence of girls in general courses and of boys in vocational streams.

This kind of horizontal segregation with boys participating more in educational programs oriented to the labour-market and girls more likely to be enrolled in courses preparing them for further education, can be found in almost all European countries. This pattern occurs regardless of the specific mix of vocational and general education offered at the upper secondary level by different systems. Therefore, this feature is equally present in countries with a very strong vocational strand, such as Austria, Slovakia and the Czech Republic and in countries where general programs are more common (e.g. Estonia and Cyprus).

The usual pattern of over-representation of males in vocational education is reversed in only a few countries, namely Belgium, the UK and Ireland (see figure annex III. 5).

Gender imbalance at tertiary level

Participation in tertiary education has been increasing substantially in recent years, but faster among women than among men and the gender balance now favours females: their participation exceeded 50% of all tertiary students in the 90s to reach 54% in 2000 and 55% according to the latest figures (2008). In 2008 out of 19 million tertiary students in the EU 10.5 million were female compared to only 8.5 million male students; females thus outnumber males by 2 million.

As a result of a lower dropout rate among women, this imbalance is even more pronounced among graduates. In 2000 58% of graduates in the EU-27 were female and their share increased further to 60% in 2008. For every one male graduating from tertiary education today, there are 1.5 female tertiary graduates.

Gender imbalance in favour of female graduates is most pronounced in teacher training, education science and in health and welfare fields. In these fields more than three quarters of graduates are female.

Figure III.3.2: Graduates by field and gender - 2000-2008 (ISCED 5 and 6)

ISCED field	All graduates in EU 27 (1000)	% female Graduates	
	2008	2000	2008
Teacher training and education science	411	68.1	78.9
Humanities and arts	327	69.2	66.4
Social sciences. business and law	1503	60.8	62.2
Maths. science and technology	936	30.7	32.6
Agriculture and veterinary	69	45.2	48.6
Health and welfare	459	74.1	76.0
Services	170	50.1	52.4

Source: Eurostat (UOE)

Gender imbalance among graduates in MST

While females outnumber male students in almost all fields of study males still predominate in maths, science and technology. Despite policy efforts to encourage women to choose these fields at the EU level - decreasing the gender imbalance is a secondary objective of the benchmark for 2010 to increase MST graduates - the female share of MST graduates increased only moderately, from 30.7% in 2000 to 32.6% in 2008 (figure III.3.2.). Romania, Estonia and Greece have the highest share of female MST graduates (over 40%) while the biggest increases since 2000 have been in Denmark, Germany and Romania (> 7.5 percentage points, figure III.3.3). The Netherlands has the lowest share of female MST graduates and this low share has not increased much since 2000. In Bulgaria, Ireland, Spain, France, Lithuania, Portugal and the UK the share of female MST graduates has declined since 2000.

Figure III.3.3: Females as a proportion of all MST graduates (ISCED 5 and 6)

	Females as a proportion of all MST graduates		
	2000	2007	2008
EU-27	30.7	31.9	32.6
Belgium	25.0	27.2	25.9
Bulgaria	45.6	39.3	37.0
Czech Republic	27.0	29.3	30.1
Denmark	28.5	36.0	36.4
Germany	21.6	29.8	31.1
Estonia	35.7	38.7	42.1
Ireland	37.9	31.3	30.4
Greece	:	44.2	41.9
Spain	31.5	29.9	30.2
France	30.8	28.1	28.2
Italy	36.6	37.0	38.4
Cyprus	31.0	31.5	37.4
Latvia	31.4	32.7	32.2
Lithuania	35.9	32.5	33.5
Luxembourg	:	32.0	48.2
Hungary	22.6	26.8	25.7
Malta	26.3	37.8	28.4
Netherlands	17.6	18.9	18.9
Austria	19.9	23.8	24.2
Poland	35.9	39.2	40.3
Portugal	41.9	34.8	34.1
Romania	35.1	40.0	43.1
Slovenia	22.8	25.0	26.5
Slovakia	30.1	35.4	36.8
Finland	27.3	28.9	33.1
Sweden	32.1	33.1	33.4
United Kingdom	32.1	31.1	31.2
Croatia	:	34.9	33.2
Iceland	37.9	34.2	:
MK*	41.6	39.8	42.8
Turkey	31.1	31.1	30.6
Liechtenstein	:	30.4	:
Norway	26.8	28.6	29.6
United States	31.8	31.0	30.9
Japan	12.9	14.4	14.2

Source: Eurostat (UOE)
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

A look at the share of female MST graduates by field reveals that the gender imbalance is mainly attributed to differences in participation in the fields of computing and engineering, where males represent more than 80% of graduates (see figure III.3.4). In computing the share of females has even declined since 2000 and the strong growth in the number of computing graduates has hence contributed to holding back the improvement of gender balance in MST at large. Outside computing and engineering the share of females has progressed markedly and gender balance has almost been reached. In life sciences there are today more female than male graduates.

Figure III.3.4: Female graduates by field. 2000-2007, ISCED 5-6 (Percentage)

ISCED field	% female graduates	
	2000	2008
Life sciences	61.2	60.0
Physical science	39.2	47.4
Mathematics. statistics	49.4	52.1
Computing	24.4	18.8
Engineering	16.0	18.3
Manufacturing. Processing	40.7	44.8
Architecture. building	29.5	38.0

Source: Eurostat (UOE)

Gender imbalance is also pronounced in architecture and building (36% female graduates), whereas in mathematics and statistics there is gender balance since 2000. As mentioned, in the field of life sciences women now predominate (63%).

3.3 Gender and the teaching profession

As discussed in Chapter 2, there are strong gender imbalances in the teaching profession (see figure III.4.4). Females are clearly overrepresented but their share falls with increasing education level of teaching and they are underrepresented in management positions (NESSE. 2009; Stromquist and Fischman. 2009; Eurydice. 2010).

At pre-school (ISCED 0) level over 90 % of the teaching staff (in some countries 99% and more) are women. At primary school level females represent over 80% of teachers (in the Czech Republic, Italy, Lithuania, Hungary and Slovenia over 95%). At lower secondary level two thirds of teachers in the EU are female. At ISCED 3 (upper secondary) level 57% of the teachers are female. In tertiary education females represent less than 40% of the teaching staff (while 55% of tertiary students are female).

Figure III.3.5: Share of female teachers, 2008

	ISCED 0	**ISCED 1**	**ISCED 2**	**ISCED 3**	ISCED 5-6
EU-27	94.6	83.2	65.7	57.3	39.2
Belgium	97.9	80.3	60.9	59.7	42.5
Bulgaria	99.8	93.5	80.9	76.8	47.1
Czech Republic	99.8	97.6	74.1	58.3	48.0
Denmark	:	68.1	:	:	:
Germany	97.8	85.2	61.6	49.0	36.7
Estonia	95.0	94.0	80.9	74.9	:
Ireland	100	84.5	:	63.7	38.3
Greece	99.2	:	:	:	:
Spain	90.6	75.2	57.9	49.1	38.2
France	82.2	82.4	64.6	53.4	37.3
Italy	99.2	95.3	71.4	59.7	35.2
Cyprus	99.4	82.4	69.1	57.1	39.7
Latvia	99.5	92.9	82.9	79.5	57.2
Lithuania	99.5	97.3	81.5	:	55.5
Luxembourg	98.4	71.7	:	47.8	:
Hungary	99.8	95.9	78.6	64.8	38.0
Malta	97.6	88.2	65.2	41.1	29.9
Netherlands	:	83.8	:	47.4	37.6
Austria	99.0	89.2	69.2	51.9	32.5
Poland	97.9	83.8	74.4	66.4	42.5
Portugal	96.6	79.8	70.6	67.2	43.2
Romania	99.7	85.9	68.5	65.9	43.3
Slovenia	98.3	97.5	78.9	64.8	37.2
Slovakia	99.8	89.3	77.7	70.4	43.8
Finland	96.6	78.3	71.2	57.7	50.8
Sweden	97.0	81.0	66.6	52.2	44.1
United Kingdom	94.5	81.4	62.5	63.3	41.7
Croatia	99.1	91.3	73.1	65.3	41.6
Iceland	96.4	80.3	:	53.3	49.0
MK*	99.5	76.6	52.2	57.0	44.1
Turkey	95.3	49.8	:	41.4	40.3
Liechtenstein	99.0	76.2	51.6	37.3	:
Norway	:	73.8	73.8	49.1	41.2

Source: EUROSTAT (UOE). EU results for ISCED 1-3: 2006 data
*MK: The former Yugoslav Republic of Macedonia; see Annex 2
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

4. Migrants

In recent years, several countries in the European Union have been experiencing high flows of migrants from third countries. Internal EU mobility has also been high, partly in connection with the two latest enlargements. As a consequence, the number of children from a migrant background has increased significantly, along with the number of school pupils born in another country. The Commission's Green Paper on migration and mobility (2008) highlighted the crucial role school has to play in ensuring that migrant pupils are integrated into the host society and in increasing their chances to be successful in social and professional life later on. At the same time, many students from a migrant background suffer from educational disadvantage, and they frequently experience low performance levels during their educational careers.

Recently, the Council concluded that specific actions should be taken by Member States to address the issue via an integrated policy approach, and invited the Commission to monitor the achievement gap between native learners and learners with a migrant background on a regular basis (Council, 2009). This section is a first effort to provide a systematic monitoring of the achievement gap, using available data at the EU level.

4.1 Background information

Migrant population

In 2009, non-nationals of the country where they reside in the European Union totalled approximately 31 million i.e. 6.4% of the total EU population[60], a rise from 5.7% only three years previously (see figure III.4.1). Among this group, almost 2 out of 3 are non-EU citizens (4% of total population) with a large share of Turks, Moroccans and Albanians (Eurostat. 2009). This number varies considerably across Member States, reflecting both different migration flows and different migration and naturalization rules.

The country with the highest share of foreigners is Luxembourg, where more than 43% of inhabitants are non-natives (but only 14% are citizens of extra EU countries). In two Baltic countries, Latvia and Estonia, 16-18% of the population is considered non-national, consisting primarily of citizens of the former Soviet Union who have the status of "recognized non-citizens" (Eurostat. 2009). In the rest of the EU, non-nationals constitute a large share of the total population in Cyprus, Spain, Ireland and Austria (more than 10%). Central and Eastern EU countries generally have low percentages of migrants.

Figure III.4.1: Non-nationals as a percentage of total population. 2009

	Non-nationals as a % of the total population			Share of non-nationals by age		
				0-5	6-17	18-24
	2006	2008	2009	2009	2009	2009
EU-27	5.7	6.2	6.4	6.0	5.7	7.9
Belgium	8.6	9.1	:	:	:	:
Bulgaria	0.3	0.3	0.3	0.0	0.2	0.2
Czech Republic	2.5	3.3	3.9	1.9	2.2	5.0
Denmark	5.0	5.5	5.8	4.7	4.7	10.1
Germany	8.8	8.8	8.8	4.9	9.0	10.9
Estonia	18.0	17.1	16.0	3.4	5.8	11.5
Ireland	7.4	12.6	11.3	11.4	11.4	11.4
Greece	7.9	8.1	8.3	9.9	8.4	8.1
Spain	9.1	11.6	12.3	11.0	12.7	17.2
France	5.6	5.8	5.8	5.8	4.4	5.1
Italy	4.5	5.8	6.5	10.8	7.2	9.0
Cyprus	12.8	15.9	16.1	:	:	:
Latvia	19.9	18.3	17.9	4.0	6.0	9.2
Lithuania	1.0	1.3	1.2	0.5	1.4	2.6
Luxembourg	39.6	42.6	43.5	55.1	45.6	41.3
Hungary	1.5	1.8	1.9	0.7	1.0	2.2
Malta	3.0	3.8	4.4	5.8	2.5	4.6
Netherlands	4.2	4.2	3.9	2.7	2.5	4.9
Austria	9.8	10.3	10.3	11.8	9.7	12.8
Poland	0.1	0.2	0.1	0.0	0.0	0.1
Portugal	2.6	4.2	4.2	2.5	3.7	5.6
Romania	0.1	0.1	0.1	:	:	:
Slovenia	2.4	3.4	3.5	1.7	1.7	4.2
Slovakia	0.5	0.8	1.0	0.4	0.3	1.2
Finland	2.2	2.5	2.7	2.5	2.1	3.4
Sweden	5.3	5.7	5.9	5.3	4.9	6.5
United Kingdom	5.7	6.6	:	5.5	4.3	9.4

Source: Eurostat

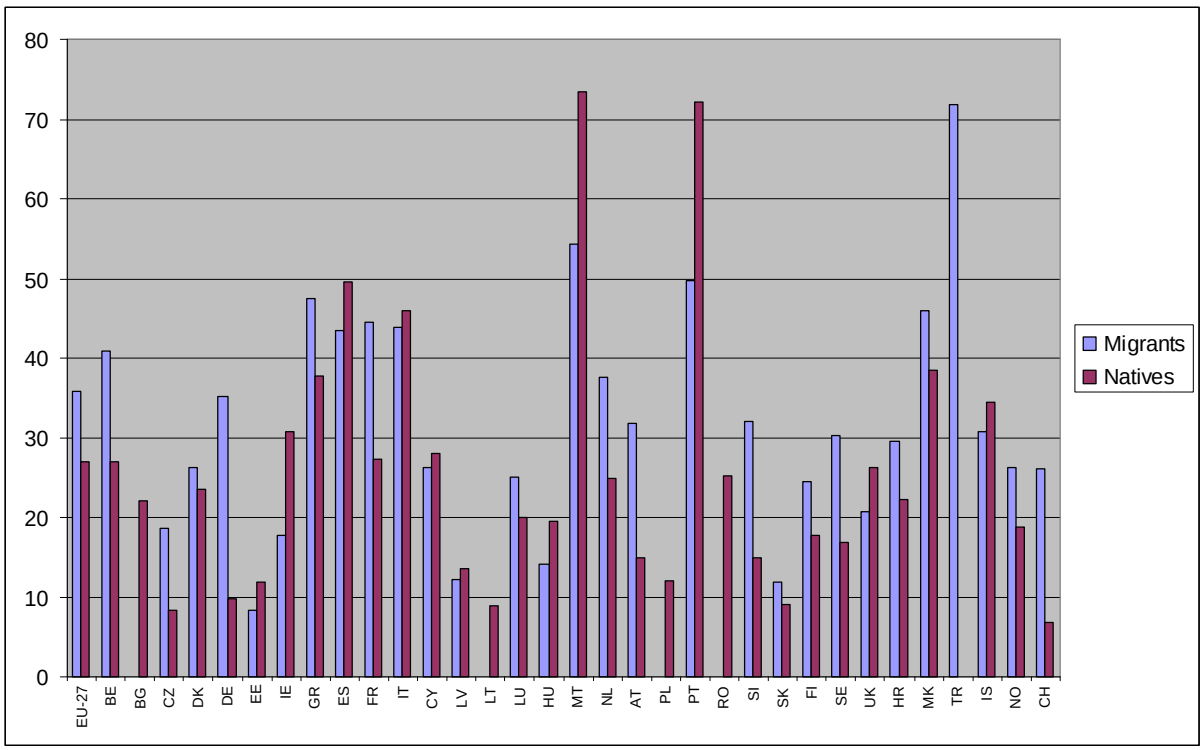
[60] Eurostat estimates for 2009.

The percentage of migrant-background children in the EU depends on age. It is slightly lower in the age group 0-5 and for the 6-17 years old (6% and 5.8% respectively), but it rises with age (7.8% in the age class 18-24) as in many countries migration flows are still predominantly labour-driven, involving mainly young adults. In five countries, the percentage of non-national young children exceeds 10%, namely Luxembourg (where actually more than 50% of children are non-nationals), Austria, Ireland, Spain and Italy.

Educational level

The level of educational attainment is generally lower for migrants than for natives. In the EU, among adults between 25 and 64 years of age 35.8% of migrants have at most lower secondary education vs. 26.9% of the native population. The percentage of low-educated migrants varies remarkably across Member States, ranging from more than 47% in Malta, Portugal and Greece, to less than 12% in Latvia and Estonia (also due to their unique "non-native population"). In countries like Slovakia, Hungary, Ireland and the Czech Republic, the proportion of the migrant population having low qualifications is also rather small (Figure III.4.2).

Figure III.4.2: Population with low educational level by migrant status (25-64 year olds) - 2009 (%)



Source: Eurostat (LFS)
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

The size of this gap between migrants and natives differs across the EU, and in several countries the disparity favours migrants, where on average, they have a higher attainment level than natives. This is frequently the case where a large proportion of natives have a low educational level, such as in Portugal, Malta and Spain, but also in countries where migration flows are often composed of highly skilled workers or students, as is the case in Ireland and the UK.

Taking first- and second-generation migrants separately, the gap is evident only for the first generation, while those classified as second-generation migrants are on average more educated than natives.[61] The composition of the migrant population reflects past and present flows shaped by changing national migration policies, labour market opportunities and migrants' networks (OECD. 2008). This can lead to substantial differences between the two generational groups, especially with regard to educational level, when newly arrived migrants (first generation) are more educated than the second generation, as is the case, for example, in Malta, Portugal, Spain, Finland, Ireland, Slovakia and Czech Republic (Figure III.4.3).

[61] Second generation is defined as natives whose parents were born abroad.

Figure III.4.3: Population (25-64) with at least upper secondary education by migrant status, 2008

	% of 25-64 year olds with upper secondary education			
	Total	Natives	Migrants second generation	Migrants first generation
EU-27	71.5	72.3	76.3	64.4
Belgium	69.7	71.5	67.9	60.6
Bulgaria	78.1	78.0	:	:
Czech Republic	90.8	91.4	73.1	77.9
Denmark	77.8	78.1	:	74.1
Germany	86.1	90.8	88.4	65.9
Estonia	88.5	87.4	:	90.7
Ireland	69.1	66.1	69.4	82.4
Greece	60.9	61.8	54.3	54.1
Spain	52.2	50.7	48.4	60.0
France	69.2	71.8	69.5	53.3
Italy	52.9	52.7	63.2	55.0
Cyprus	73.5	72.7	:	76.4
Latvia	85.8	86.2	89.2	84.3
Lithuania	90.5	90.5	:	:
Luxembourg	68.3	68.7	74.6	67.6
Hungary	79.7	79.6	:	84.6
Malta	28.1	26.9	25.2	47.8
Netherlands	71.7	73.7	70.7	59.9
Austria	82.0	84.7	82.6	70.0
Poland	87.2	87.1	91.0	100
Portugal	28.1	25.9	38.9	49.5
Romania	75.2	74.9	81.2	100
Slovenia	81.6	83.3	:	65.8
Slovakia	89.7	89.7	86.5	94.1
Finland	81.2	83.6	60.8	73.5
Sweden	80.7	82.7	83.7	70.1
United Kingdom	73.4	72.3	77.4	78.6

Source: Eurostat (LFS)

4.2. Migrants education

Participation in pre-compulsory early childhood education

As stated previously in section 1.1, young children and their families should have the opportunity to benefit from participation in early education arrangements of high quality, particularly those children who have the most to gain regarding long-term social and personal outcomes. Given the disparities between migrants and natives in later outcomes in some countries, such as employment status, educational achievement and attainment levels, participation in early childhood education can provide an early opportunity to integrate children in the host society and to learn the language of instruction.

Figure III.4.4: Participation (age 4 to start of compulsory education) in early childhood education, migrant and native parents (%)

	Migrant	Native
Belgium	99	98
Czech Republic	100	83
Estonia	95	92
Spain	100	97
Italy	88	96
Cyprus	87	97
Latvia	100	100
Netherlands	100	100
Austria	78	87
Portugal	100	90
Sweden	100	100
United Kingdom	100	99
Iceland	74	97

Source: EU-SILC Cross-sectional (2008)
Note: Migrant' refers to both mother and father of child born abroad

There are few sources of reliable data to provide the level of detail that is needed to assess the situation. There are only thirteen countries for which there is household data (EU-SILC Cross-sectional 2008) on children aged four to compulsory age (primary or pre-primary) who are enrolled in ISCED 0 or whose parents (i.e. both parents or one parent if in single parent family) were born outside the country (Figure III.4.4)[62]. Countries are not included if the migrant population and sample sizes are not large enough to make adequate statistical inferences or if compulsory education has already commenced by the age of 4 (Luxembourg).

In the context of these limitations, three basic patterns emerge from the data in respect to the possible disparities in enrolment although the differences are rather slight in the majority of countries. In most for which there is available data, native and migrant children enrol equally in systems where participation in organised instruction is nearly universal, such as in Belgium, the Netherlands, Spain, Sweden and the United Kingdom.

The second pattern is that children with parents born abroad appear to participate slightly more than native children in Estonia and the Czech Republic. According to the same dataset, in both countries the overall participation is rather high. In Portugal, on the other hand, the gap is about 10 percentage points with 100% of migrant-background children registered as participating in ISCED 0.

Finally, there is a third group of countries where the participation of children with migrant parents in formal ECEC is lower. This is the case in Austria, Cyprus, Iceland and Italy. The largest discrepancies appear in Iceland and Cyprus in which there is a difference of over 20 and 10 percentage points, respectively. The same is true for Italy, where the proportion of ECEC children with native parents reaches 96%, compared to 88% for migrant-background children.

Nevertheless, this analysis suggests that, at least in some of the countries covered, migrant children participate as much or even more than natives in early childhood education. Further study is necessary both to widen and to strengthen the evidence on this potentially very interesting point.

Early leavers from education and training

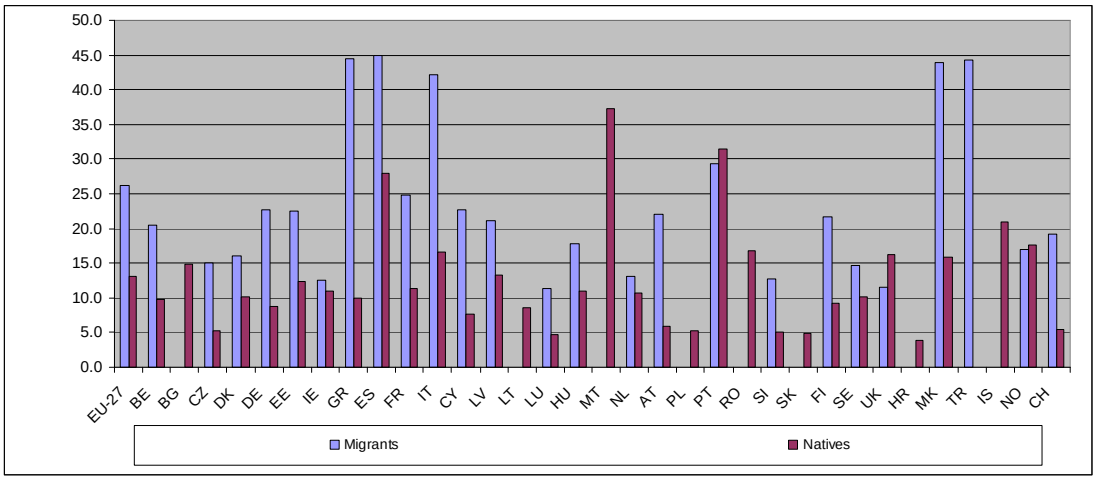
Young people with a migrant background are generally more at risk of exiting the education and training system without having obtained an upper secondary qualification. This is a concerning trend given that early school leaving adds to the already high risk of exclusion faced by young people with migrant background. As shown in figure III.4.5, the overall disparity between migrant and non-migrant early school leaving rates for the EU-27 is high. The percentage is almost double for young people with a migrant background (26.3% vs. 13.1%), which is similar to figures for 2008; although for both groups there has been a slight overall decrease.

The most marked differences in these ratios are in Southern Europe (Greece, Spain, Italy and Cyprus) and France. Within this group, countries in which the overall rate for migrants is far above the EU average are Greece (44.4%), Spain (45%) and Italy (42.4%). The former Yugoslav Republic of Macedonia is also in this category, with 43.8% of migrants and 15.9% native early leavers. Most other countries, however, display a similar pattern of increased likelihood of early school leaving for students of migrant background, for example, in Austria (22.1% compared to 6.0%) and Germany (22.7% compared to 8.8%), where migrants are between 3 and 4 times more likely to leave the educational system without completing upper secondary education or continuing their education with alternative learning activities.

There are a few countries where the situation is reversed, namely Portugal, the United Kingdom and Norway; in the latter case there is little difference in respect to the completion rates for migrants (17.0%) and natives (17.7%).

[62] Although information in participation in other categories of organized ECEC arrangements is included in the EU-SILC dataset, only children in ISCED 0 are considered here which is problematic in some countries such as Germany and Denmark since in EU-SILC ISCED 0 is reportedly not the most prevalent form of ECEC. 'Migrant-background' refers to birthplace of parents only and not citizenship although this definition may not be suitable in all situations and in countries.

Figure III.4.5: Early leavers from education and training by migrant status, 2009 (rates)



Source: Eurostat (LFS)
Notes: Data for Luxembourg, Croatia, Hungary, Slovenia, Finland and The former Yugoslav Republic of Macedonia lack reliability due to small sample size
Migrants include non-nationals and those born abroad
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Educational performance of migrant students

PIRLS focuses on assessing reading literacy for students in the 4th grade of school while PISA is a study on the reading literacy, math and science attainment of 15 year old students. This analysis distinguishes between native and migrant students and, within this last category, between first and second generation migrants and focuses on the differences in performances among these categories in the two studies[63]. Coming from abroad and entering into a new school system after school has started might be part of the experience for many first-generation migrant students.[64] Second-generation students, on the other hand, because they were born in the country of assessment can be expected to have had their entire schooling in the host country.

As acknowledged by OECD (2007) in analyzing migrant students' achievement and in comparing it among countries we need to take into account possible differences in the migrant population, such as country of origin(s), socio-economic factors and the educational and linguistic backgrounds of the students. Nevertheless, even after accounting for socio-economic background and for the language spoken at home, there is still a considerable achievement gap between native and migrant students.

Gaps between native and migrant students

In comparing the reading literacy achievement of native versus migrant fourth grade students in PIRLS 2006, there is a consistent pattern reflecting migrant students' lower performance. As figure III.4.6 shows, for the majority of countries there is a significant difference of around 40 points between the two groups of students. Latvia is the only country where the difference is much smaller and to the advantage of migrant students.

[63] First generation migrant students refers to students whose parents are foreign born and who themselves were born in another country. Second generation migrant students refers to students that were born in the country of assessment and have foreign born parents. The native category includes students born in the country who have at least one of their parents born in the country o assessment.

[64] In PIRLS and PISA the criterion set for sampling was defined to exclude migrant students with less than one year of instruction in the language of assessment

Figure III.4.6: PIRLS 2006 Overall reading comparison between natives and migrants

	Native students Average score 2001	Migrant students Average score 2001	Native students Average score 2006	Migrant students Average score 2006	Differences in scores between native and migrant students 2001	Differences in scores between native and migrant students 2006
Austria	-	-	547	503	-	**44**
Belgium fr		-	507	480	-	**27**
Belgium fl		-	551	511	-	**40**
Cyprus	497	477	-	-	**20**	-
Denmark	-	-	550	511	-	**39**
England	558	536	550	503	**22**	**47**
France	532	503	528	496	**29**	**32**
Germany	551	497	561	515	**54**	**46**
Italy	542	505	554	524	**37**	**30**
Latvia	546	551	541	547	**-5**	**-6**
Luxemburg	-	-	578	528	-	**-50**
Netherlands	559	516	553	513	**43**	**40**
Scotland	534	506	535	485	**28**	**50**
Slovenia	505	478	526	488	**27**	**38**
Spain	-	-	520	481	-	**39**
Sweden	566	524	555	521	**42**	**34**

Source: CRELL analysis

In PIRLS, the achievement gap between native and migrant students narrowed between 2001 and 2006 in Sweden, Italy, Germany and, although less markedly, also in the Netherlands. On the contrary, in England, Scotland and Slovenia and to a lesser extent in France, the achievement gap between native and migrant students widened in the same period. For England and Scotland the gap in performance almost doubled between 2001 and 2006. But whereas this relative dis-improvement for migrants in England is visible against a statistically significant national decline, in Scotland it is less clear cut. In fact, comparatively and in relation to changes at the national level (combined overall native and migrant students´ score), the scenarios are different for the nine countries that participated in both surveys[65].

PISA 2009 data (Figure III.4.7) show a broadly constant gap since 2000. In some countries such as Belgium, (from a very high previous level), Denmark, Czech Republic, Germany, Greece the gap is narrowing. In other countries such as Spain, France, Italy and Ireland it is widening. The gap in scores is the widest in Ireland, Finland, Belgium and Sweden. At the EU level, migrant students are one and a half year behind their native peers at the age of 15 with regard to their reading skills.

[65] PIRLS 2007 p. 44 Exhibit 1.3

Figure III.4.7: PISA 2009 Overall reading – comparison between native and migrant students

	% of students with an immigrant background		Average scores			
			Students with an immigrant background		Difference in performance between native students and migrant students	
	2000	2009	2000	2009	2000	2009
EU (14 countries)	**8.1**	**11.0**	**449**	**445**	**53**	**56**
Belgium	12.0	14.8	417	451	106	68
Bulgaria	0.4	0.5	:	:	:	:
Czech Republic	1.1	2.3	463	457	38	22
Denmark	6.2	8.6	424	438	80	63
Germany	15.2	17.6	423	455	84	56
Estonia	:	:	:	:	:	:
Ireland	2.3	8.3	552	473	-24	29
Greece	4.8	9.0	413	432	65	57
Spain	2.0	9.5	457	430	37	58
France	12.0	13.1	464	444	48	60
Italy	0.9	5.5	450	418	39	72
Latvia	22.1	4.5	452	474	11	11
Lithuania	:	:	:	:	:	:
Luxembourg	:	40.2	:	442	:	52
Hungary	1.7	2.1	489	507	-7	-12
Netherlands	:	12.1	:	470	:	46
Austria	11.0	:	409	:	93	:
Poland	0.3	0.0	:	:	:	:
Portugal	3.1	5.5	457	466	14	26
Romania	0.2	0.3	:	:	:	:
Slovenia	:	:	:	:	:	:
Slovakia	:	:	:	:	:	:
Finland	1.3	2.6	476	468	71	70
Sweden	10.5	11.7	465	442	58	66
United Kingdom	:	10.6	:	476	:	23
Iceland	0.8	2.4	:	423	:	81
Liechtenstein	20.6	30.3	419	479	81	31
Norway	4.6	6.8	454	456	56	52
USA	13.6	19.5	472	484	39	22
Canada	20.5	24.4	526	521	12	7
Japan	0.1	0.3	:	:	:	:
Korea	:	0.0	:	:	:	:

Source: OECD (PISA), average scores for 14 EU countries with comparable data

It is worth noting that research studies on the learning inequalities amongst immigrant children using other surveys found that immigrant children perform relatively better in mathematics than in reading (Schnepf. 2008). The explanation seems to be that in surveys such as TIMSS (Third International Mathematics and Science study) most of the mathematics questions are in a multiple-choice format and thus require less language skills. In contrast, in reading surveys such as PISA which requires the interpretation of word problems, language proficiency plays a significant role, immigrant children tend to perform even worse.

First- and second generation migrant students' performance

Performance differs between first- and second generation migrant students. In PIRLS 2006 (15 European countries) in the majority of countries, second generation migrant students generally perform better than first generation (see figure III.4.8). This is to be expected since second generation students are born in the host country while this is not the case for first generation migrant students. However, the situation is not clear-cut. England, Sweden, France, Slovenia and Netherlands display a pattern of second generation students outperforming first generation migrant students. For other countries, however differences are minor or reversed. In Latvia and to some extent in Belgium (mostly in the Flemish community but also in the French-speaking community) first generation students outperform second generation.

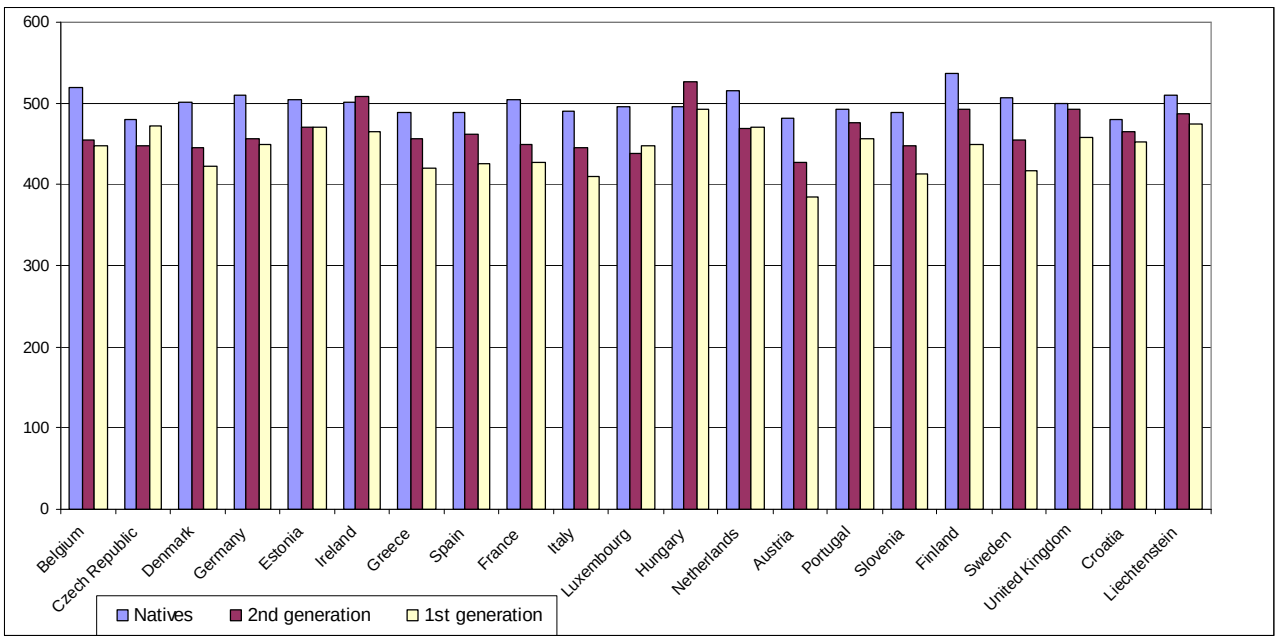
Figure III.4.8: PIRLS 2006 Reading differences between 1st and 2nd generation students

	2nd generation migrant student	1st generation Migrant students	Difference in scores between 2nd and 1st gen migrant students
Austria	507	493	14
Belgium fr	479	482	-3
Belgium fl	506	520	-14
Denmark	514	504	10
England	525	478	47
France	499	485	14
Germany	515	514	1
Italy	523	526	-3
Latvia	522	550	-28
Luxemburg	527	529	-2
Netherlands	514	508	6
Scotland	484	487	-3
Slovenia	490	479	11
Spain	477	482	-5
Sweden	527	501	26

Source: CRELL analysis

Performance differences between first and second generation migrant students in PISA 2009 also show that second generation students outperform first generation ones in almost all of the participating countries although the differences are negligible in many countries (figure III.4.9).

Figure III.4.9: PISA 2009 reading scores by migrant status



Source: CRELL analysis, OECD (PISA)
Note: Comparisons should be taken with caution because Estonia and Latvia have less than 100 1st generation students and Greece and Ireland have less that 100 2nd generation students

With respect to mathematics performance in PISA, the differences between first and second generation migrant students are not as pronounced. In addition to Austria and Germany, first generation students in the Netherlands also outperform second generation ones. Moreover, both groups of students have identical attainment in the UK. In fact, "there are larger differences in performance between first-generation and native students in reading and science than in mathematics and problem solving (OECD. 2007, p. 37). As mentioned before differences between first and second generation students can reflect differences in migrant patterns during the last 30 years.

Gender differences in performance for migrant students

In all but three countries participating in the PIRLS 2006 study the difference between migrant boys and girls in reading literacy goes in favour of girls' performances. For most countries there is a marked difference, but it is non-existent in Italy, Spain and Luxembourg, where boys and girls perform equally. Considering 1st and 2nd generation students, the pattern in favour of girls' performance stays constant for a majority of the countries, i.e. girls perform better both as first and second generation migrants. For a few countries the pattern is more scattered in terms of which gender performs better. It is interesting to note that for the three countries where no gender differences were found for migrant students in general, gendered differences were found when considering first and second generation migrant students.

Performance gaps in PIRLS and PISA

In comparing student attainment in the two different surveys, it appears that the achievement gap between native students and migrant ones widens as students progress in school. This can be interpreted as a result of inefficient or inadequate educational policies and practices. However, it could also be partially explained by differences in the studies´ design and the demands they place on students as well as by differences in the migrant students' age at the arrival. In addition, in light of the results of these two surveys, it is apparent that most countries register a better performance of second generation than first generation migrant students.

Nevertheless, as previous analysis of PISA results have shown, high levels of migration do not seem to be associated with an increase in the gap between migrant students and native students (OECD. 2007). Immigrant students have positive attitudes toward school. For example, both first and second generation migrant students report high levels of motivation and interest in mathematics (OECD. 2007). Finally, as migrant students are increasingly present in European schools, national governments are also expanding measures directed at facilitating their integration. For example, most countries now publish information on the school system in the mother tongue of immigrant families and implement host language tuition for immigrant students (Eurydice. 2009).

Migrant children and special needs

Recent research (EUMC. 2004; NESSE. 2008; European Agency. 2009) suggests that there is an over-representation of migrant children in schools for pupils with special needs. In particular, this is the case in provision addressed to pupils with learning and behavioural problems.

The Green Paper on Migration also refers to: "The high concentration of children of migrants in special schools for disabled pupils evident in some countries is an extreme case of segregation."[66]

Although the situation needs to be carefully analysed as it cannot be interpreted in a simple way, the fact that pupils with an immigrant background are often over-represented in special schools cannot be ignored. One factor for further exploration is the possible confusion in distinguishing between language difficulties and learning problems. This situation appears to indicate that very often there are inadequate and/or inappropriate assessment procedures used in determining the individual learning needs of pupils with an immigrant background and a possible special educational need.

Adult participation in lifelong learning

Adult learning is especially relevant for migrants as it offers an opportunity to develop their potential, adapt their competencies to the local labour market, foster inclusion and social participation (Council, 2010).

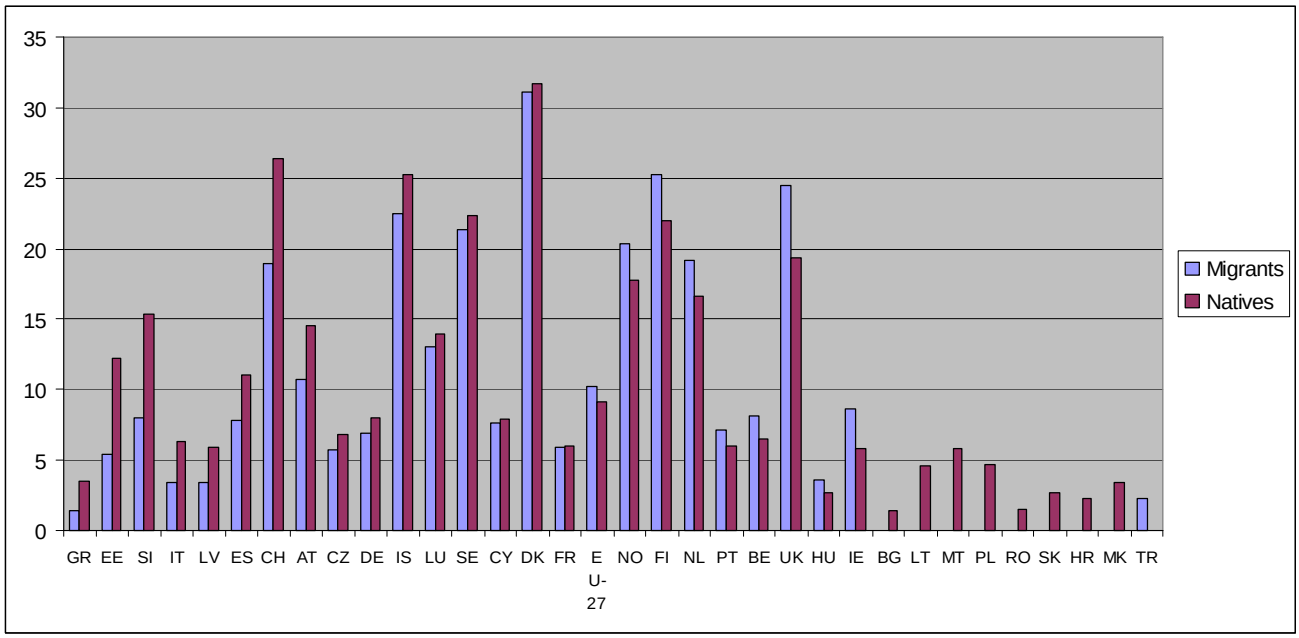
There are indications that EU education and training systems are succeeding in reaching this group, as participation rates in lifelong learning are higher for migrant adults than for natives (10.2% vs. 9.1% respectively). Women's participation is generally higher, and thus migrant women's advantage is clear with respect to natives (+1.4 percentage points for women vs. +0.9 for men).

Migrants are more frequently involved in adult learning in Ireland, Hungary, the UK and Belgium, where they are at least 25% more likely to participate than natives (figure III.4.10). This group includes both countries with quite developed systems (in the UK, for example, the overall participation rate is 20.1%) and countries where LLL is still quite limited such as Hungary (2.7%) and Belgium (6.8%).

[66] COM (2008) 423 final p. 9.

In the EU, second-generation migrants have a slightly higher participation rate than the first generation and even more with respect to natives (+ 2.2 percentage points). Even though newly arrived migrants may be more in need of training, e.g. to improve their knowledge of the host country language or to adapt their skills to the local labour market, in the large majority of countries they are actually less likely to take part in learning activities.

Figure III.4.10: Adult participation in lifelong learning by migrant status, 2009 (rates)



Source: Eurostat (LFS)

CHAPTER IV

Enhancing creativity and innovation, including entrepreneurship at all levels of education and training

Why creativity, innovation and entrepreneurship?

"Enhancing creativity and innovation, including entrepreneurship, at all levels of education and training" is the Strategic Objective 4 of the Strategic Framework for European cooperation in education and training ('ET 2020'). The Council Conclusions of May 2009 in which the framework was agreed underlined the rationale for launching policy reflection in this area

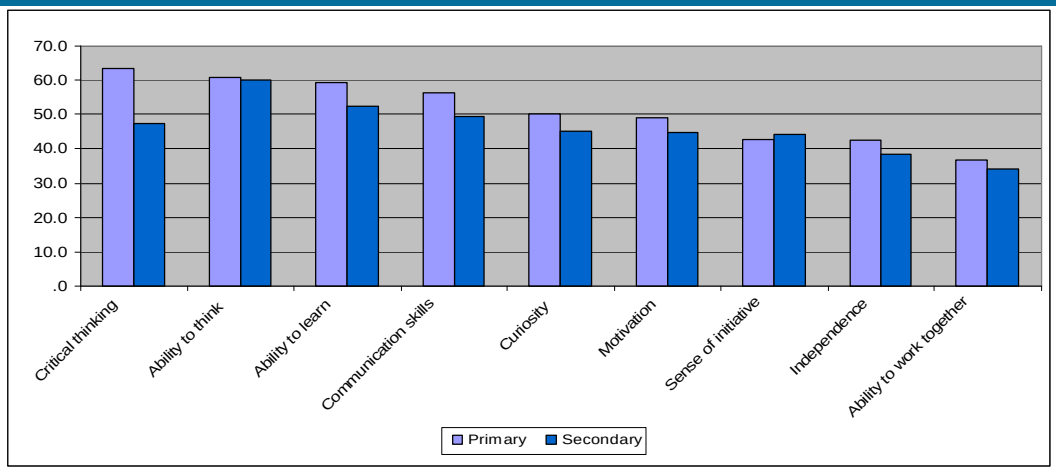
> *"As well as engendering personal fulfilment, creativity constitutes a prime source of innovation, which in turn is acknowledged as one of the key drivers of sustainable economic development. Creativity and innovation are crucial to enterprise development and to Europe's ability to compete internationally. A first challenge is to promote the acquisition by all citizens of transversal key competences such as digital competence, learning to learn, a sense of initiative and entrepreneurship, and cultural awareness. A second challenge is to ensure a fully functioning knowledge triangle of education-research-innovation. Partnership between the world of enterprise and different levels and sectors of education, training and research can help to ensure a better focus on the skills and competences required in the labour market and on fostering innovation and entrepreneurship in all forms of learning"[67].*

The Council further asked the Commission to launch work on how to promote and evaluate progress with regard to this Strategic Objective. The Commission, in the context of 2009 the European Year of Creativity and Innovation (EYCI), launched many initiatives on how to measure creativity and innovation. The International Conference "Can creativity be measured?"[68] and the publication "Measuring creativity"[69] considered possible approaches at regional, national and individual levels. Drawing on these and on international research, this chapter reviews evidence regarding the extent to which creativity, innovation and entrepreneurship are being addressed in education and training.

1. Creativity

The indicators on innovation and creativity at national and regional levels which were presented in "Measuring creativity" could be regarded as indicators of the environment where creativity can flourish. It is clear that precise measures of what constitutes an individual's creativity or that of a group or region do not exist. Rather than seeking to come up with formal measures, this chapter has sought to identify where creativity - the term itself and other expressions of the concept – is appearing within education systems as they address different subject areas and, indeed, all of the eight key competence areas adopted by the Council.

Figure IV.1.1: Skills and abilities fostered in class by teachers according to school level (%)



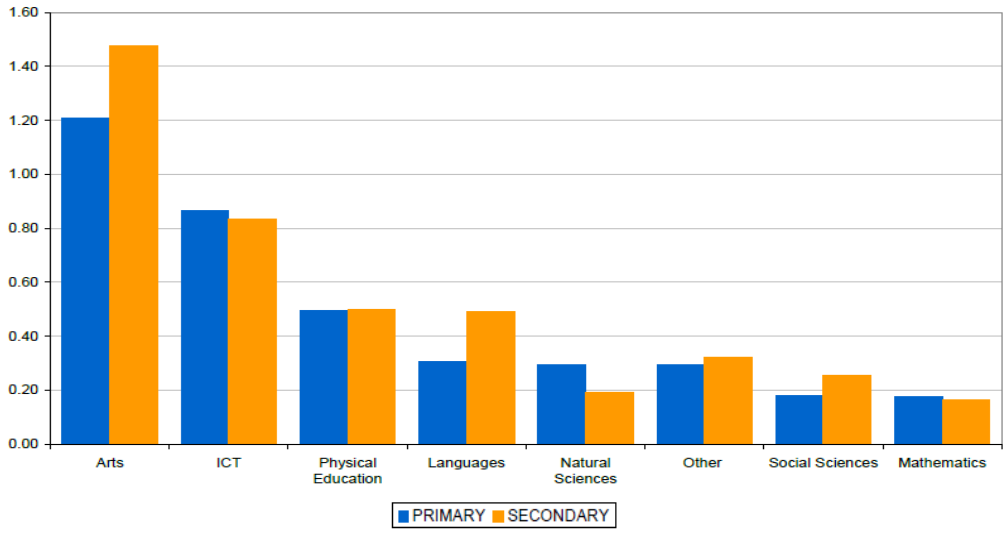
Source: JRC/IPTS, EC/DG EAC and EUN

It is important also to look into possible ways of assessing creativity in teachers[70] - see Figure IV.1.1[71] - and students, and at how it may be possible to assess whether students are leaving schools with the adequate creative capacities.

[67] Council conclusions of 12 May 2009 : http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2009:119:0002:0010:EN:PDF
[68] http://ec.europa.eu/education/lifelong-learning-policy/doc1427_en.htm
[69] http://ec.europa.eu/education/lifelong-learning-policy/doc2082_en.htm
[70] IPTS/JRC, *Creativity in Schools: A Survey of Teachers in Europe* http://ftp.jrc.es/EURdoc/JRC59232.pdf . For this online survey which was posted on the eTwinning website and promoted through national and European channels in September-October 2009, data was gathered from teachers across 32 countries at different school levels. The scope of the analysis is limited to responses (7,659 in total) from teachers teaching in obligatory schooling (ISCED levels 1 and 2) in EU 27. The results of this survey are not representative of the teacher population in Europe due to some raisons, such as the over representation of some countries, and the online mode of

An analysis[72] aimed at measuring the extent to which creativity and innovation are present in school curricula in the EU27 undertook a frequency count of the terms creativity and innovation and synonyms within compulsory curricula – see Figures Ann. IV.2 and IV.3 -. In this analysis, eight subject groups were identified (Figure IV.1.2): Arts (art, music, drama, wood work, history of arts), Languages, Mathematics, Natural Sciences (Biology, Chemistry, Physics, Nature), Social Sciences (history, geography, social studies, civic education, philosophy), Physical Education, ICT (ICT, media, computer science, design and technology, technology) and Other (religious education, ethics, social, personal and health education, home economics). The subject group 'Arts' shows the highest overall occurrence of the terms creativity, innovation and their synonyms, followed by subject groups 'ICT' and 'Physical Education'.

Figure IV.1.2: Relative occurrence of Creativity, Innovation and synonyms in primary and secondary school curricula in EU27 –curricula subject groups



Source: JRC/IPTS, EC/DG EAC and empirica Gmbh

Overall, two major approaches to creativity emerge. When creativity is defined as a creative task or activity, then it is usually linked to specific subjects such as Art, Music, Languages, and Technologies. The focus is on doing things creatively. The other approach conceives Creativity more broadly and considers it as skills, like 'creative thinking' or 'creative problem solving' which should be encouraged and developed in all subjects. In this more transversal approach, the world Creativity is often linked to capacity building, empowerment, problem solving, self expression and (personal) development of pupils and students and with terms such as: awareness, capacity, independence, initiative, learning, personality, responsibility, skills, solutions, understanding or thinking.

These results need to be handled with great caution when comparing and drawing inferences. There is, for example, a huge variance in the status and relevance to actual educational practices of the compulsory curriculum. And, even if statutorily established as part of the curriculum, listing the terms creativity and innovation does not guarantee their effective practice in schools.

administering the survey and reliance on voluntary participation. Despite these limitations, this survey is unique as it is the first time that such a high number of teachers' opinions on creativity in the EU27 have been collected. The online survey also showed that teachers in Europe believe that creativity is an important transversal competence that should be developed at school and that ICT can enhance creativity. A great majority of teachers also believe that creativity can be applied to every domain of knowledge and to every school subject. However, even when a big majority of teachers believe everyone can be creative, the conditions necessary to favor creativity are not always available in schools (see Figure Ann. IV.1)

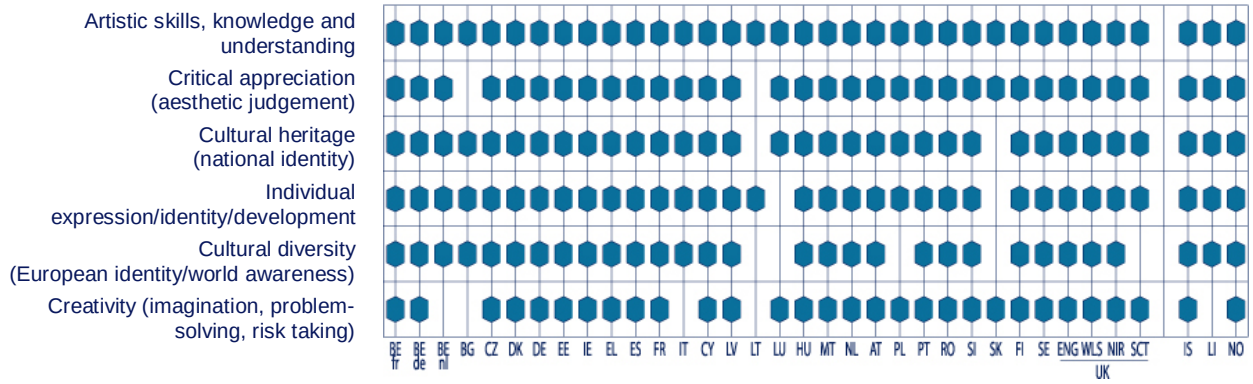
[71] As can be noted in Figure IV.1.1, with the exception of the 'ability to think' and 'sense of initiative', higher percentage of primary teachers claim to *always* foster the listed skills and abilities in their students. The percentages are relative to the total number of respondents who have ticked "always" to the question "How often do you foster the following skills and abilities in your students?"

[72] Heilmann, G., & Korte, W. B, 2010: *The Role of Creativity and Innovation in School Curricula in the EU27: A content analysis of curricula documents,* Seville, EC JRC/IPTS: ftp://ftp.jrc.es/pub/EURdoc/JRC61106_TN.pdf . This report presented an analysis of EU27 school curricula. In total, 37 countries and/or regions were studied, and around 1,200 curricula documents were identified and analysed, using the search terms Creativity and Innovation (and their stems creativ* and innovat*) and five synonyms of these terms selected from an initial list of 15 synonyms from national experts. Even if this analysis presents some restrictions and limitations when comparing and drawing inferences from the results (vast amount of empirical data concerning different countries, different origin/format/style of curricula), however, a major finding of the study is that Creativity and Innovation – the latter to a much lesser extent– effectively feature in the curricula of primary and secondary education in Europe.

1.1 Creativity and cultural awareness and expression

Cultural awareness and expression is essential to the development of creative skills, as it concerns the "appreciation of the importance of the creative expression of ideas, experiences and emotions in a range of media, including music, performing arts, literature, and the visual arts"[73]. Cultural knowledge refers to cultural heritage and to cultural and linguistic diversity. It is linked to skills such as self-expression through the use of different media and art forms, the ability to respond to expressive points of view and the opinions of others, and to identify and realise social and economic opportunities in cultural activities.
Arts and cultural education[74] is present in all national curricula, varying by learning aims/outcomes, by global/detailed definition and by ISCED levels. Figure IV.1.3 shows that six aims are normally present in primary and secondary cultural education – artistic skills, knowledge and understanding, critical appreciation, cultural heritage, individual expression/identity/development, cultural diversity and creativity[75] .

Figure IV.1.3: Aims and objectives of arts and cultural curricula – ISCED 1 and 2 – 2007-2008



Source: Eurydice

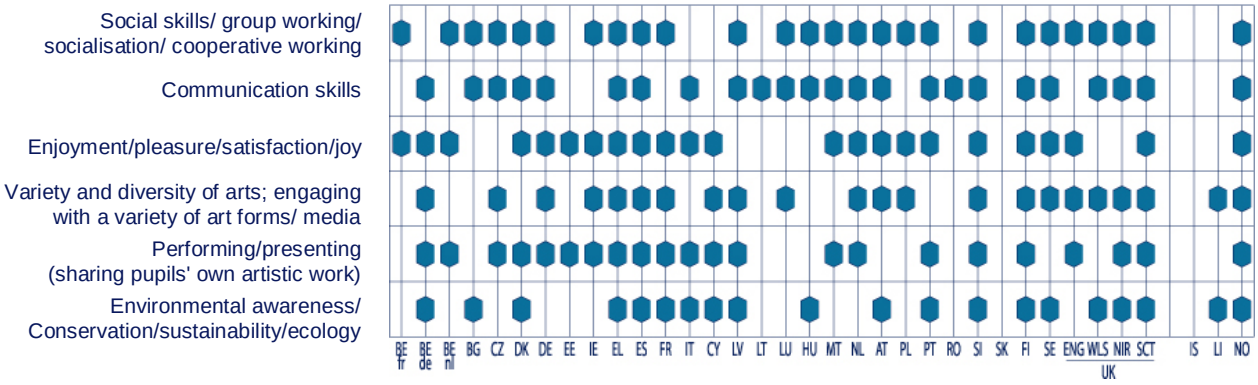
Figure IV.1.4 highlights aims which are not necessarily arts-specific. The objective of developing social skills is present in 26 curricula and especially linked to performing arts such as drama. The development of enjoyment/pleasure/satisfaction/joy – common to all art forms – is an objective in 23 curricula, and communication skills – particularly linked to performing and media arts – are present in 24.
Other commonly found objectives include (not all are shown in the Figures): exposure to various experiences and to various means of artistic expression; skill in performing or presenting a work; and building environmental awareness.

[73] Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences (2006/962/EC) http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:394:0010:0018:EN:PDF

[74] Eurydice: Arts and cultural education in Europe http://eacea.ec.europa.eu/education/eurydice/documents/thematic_reports/113EN.pdf

[75] "**Artistic skills, knowledge and understanding** are, in general, the skills forming the foundation of 'artistic language' (such as the understanding of colours, lines and forms in the visual arts or, in music, listening and instrumental performance skills). The development of artistic skills tends to include learning the different artistic styles and genres. In that regard, some countries refer to a repertoire of specific works, in particular for music and drama. Artistic understanding tends to focus on artistic concepts, such as understanding the characteristics of different means of artistic expression or the relationship between the artist, his or her cultural and physical environment and his or her works. **Critical appreciation** (aesthetic judgment) is among the six aims most often referred to. It is concerned, in particular, with raising pupils' awareness of the essential features of a work or of a performance and with developing their capacity for critical judgment in evaluating their own work or that of others. (…) **Cultural heritage** (…) is connected with the creation of cultural identity: the learning of cultural forms seeks to develop in a pupil selfunderstanding as a country's citizen or a member of a group. The understanding of cultural heritage is promoted through contact with works of art, as well as through learning the characteristics of works of art produced in different historical periods and of certain artists' works (sometimes from a predetermined repertoire or from artistic 'canons'). The understanding of **cultural diversity** is another aim common to most of the arts and cultural curricula. The promotion of cultural diversity through the arts also seeks to raise awareness of cultural heritage and modern genres specific to different countries and cultural groups (sometimes with specific reference to European cultures). The **development of individual expression** and the **development of creativity** are two other very widespread aims, although the latter is referred to in slightly fewer countries. The development of children's individual expression by means of the arts is closely linked to their emotional well-being. That type of aim is connected with all art forms but in particular with the visual arts." See: *Eurydice, idem*

Figure IV.1.4: Aims and objectives of arts and cultural curricula – ISCED 1 and 2 – 2007-2008



Source: Eurydice

2. Innovation

The concept of innovation could be defined as the process by which new or significantly improved products, goods, services, processes or methods are brought into being. Traditionally related to the business sector[76], innovation is seen increasingly as having a very broad scope, a vital driver of change, modernisation and of responses to global challenges like climate change, energy and resource efficiency, health and demographic change[77].

Since 2008, the European Innovation Scoreboard (EIS)[78] provides a multidimensional indicator (the "Summary Innovation Index" – SII[79]) aiming at capturing the specificities of different innovation processes and models. The SII is a composite indicator that tracks and benchmarks relative innovation performance across the European Union and Croatia, Turkey, Iceland, Norway and Switzerland.

The 2009 Summary Innovation Index clusters countries in the following four groups:

- Innovation leaders (Denmark, Finland, Germany, Sweden, Switzerland and the United Kingdom), with innovation performance well above the EU27 average;
- Innovation followers (Austria, Belgium, Cyprus, Estonia, France, Iceland, Ireland, Luxembourg, the Netherlands), with innovation performance above the EU27 average but below the one of the innovation leaders;
- Moderate innovators (Iceland, the Czech Republic, Greece, Hungary, Italy, Lithuania, Malta, Norway, Poland, Portugal, Slovakia, and Spain), with innovation performance below the EU27 average;
- Catching up countries (Bulgaria, Croatia, Latvia, Romania, Serbia, and Turkey), with innovation performance well below the EU27 average.

All countries have improved their innovation performance over the last five years. Section 2.1 which follows uses this categorisation of countries to look at two potentially relevant education indicators.

[76] According to the Oslo Manual (OECD and Eurostat, 2005, p. 46) innovation concerns the implementation of new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations. This definition can be encompasses four main types of innovation:
- Product innovation: the inclusion of a good or service that is new or significantly improved with respect its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness of other functional characteristics.
- Process innovation: the implementation of new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software.
- Marketing innovation: the implementation of a new marketing method involving significant changes in product design of packaging, product placement, product promoting or pricing.
- Organizational innovation: the implementation of a new organizational method in the firm's business practices, workplace organization or external relations.

[77] Council conclusions of 12 May 2009 : http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2009:119:0002:0010:EN:PDF
[78] http://www.proinno-europe.eu/page/european-innovation-scoreboard-2009
[79] See annex IV.2

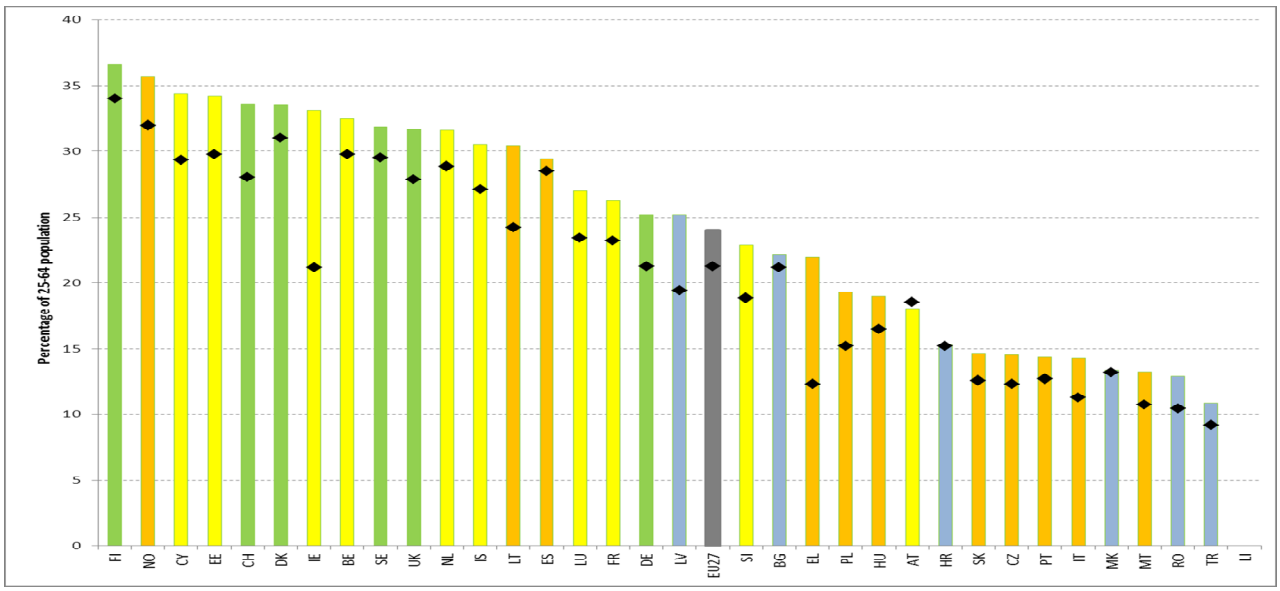
2.1 The role of Education in innovation

The role of education in relation to innovation is to produce the knowledge and skills necessary for people to become innovators and to build habits and ways of working within which innovation can flourish, such as problem solving, good communication and team working skills.

As a basic and somewhat traditional measure of how well education is building innovation, one approach is to focus on how education systems are providing pools of graduates from tertiary education (ISCED 5 and 6) to ensure a proper take-up of knowledge and innovation as well as a sufficient number of personnel to carry out research and development activities[80].

As shown in Figure IV.2.1, the share of population aged 25 to 64 with a high level of education (ISCED 5 or 6) is above the EU27 average (24%) for all the innovation leader countries (ranging from 25.2% of Germany to 36.6% of Finland) and for the innovation followers with the exception of Austria (18%) and Slovenia (22.9%); on the contrary, the indicator is below the EU27 average in all the catching up countries with the exception of Latvia (25.2%).

Figure IV.2.1:
Percentage of population aged 25 to 64 with a tertiary educational attainment (ISCED 5 and 6), 2008

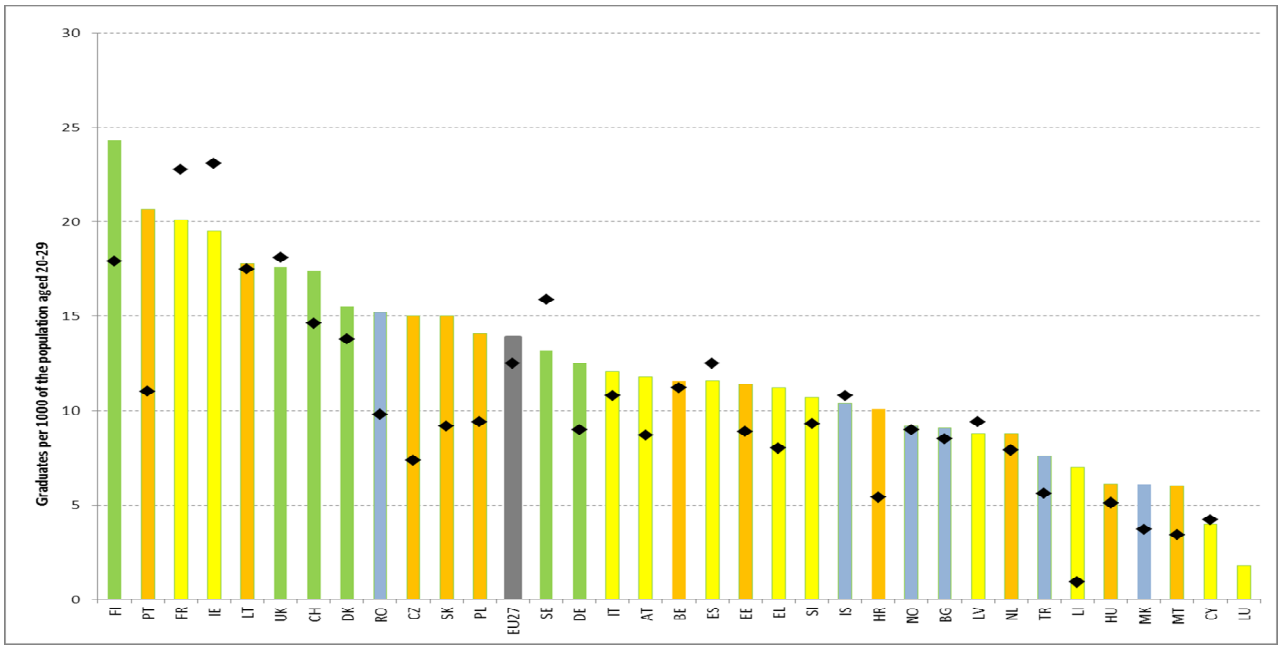


Source: CRELL/JRC based on Eurostat's LFS database (August 2010).
Note: different colours indicate different group of countries: green are the innovation leaders, yellow are the innovation followers, orange the moderate innovators, and blue are the catching up countries. In grey the EU27 average. Bars indicate the value of the indicator in 2008; black markers indicate the value of the indicator in 2004 with the exception of DK (2007), ES and SE (2005), MK and TR (2006).
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

In the period between 2004 and 2008, the share of population which is highly educated has increased in all EU and candidate countries except Austria, Croatia, and the former Yugoslav Republic of Macedonia where it is stable.

[80] http://ec.europa.eu/research/era/pdf/key-figures-report2008-2009_en.pdf

Figure IV.2.2: Graduates in mathematics, science and technology (ISCED 5-6), 2008
Graduates per 1000 of the population aged 20-29



Source: Eurostat, Education statistics (August 2010).
Note: different colours indicate different group of countries: green are the innovation leaders, yellow are the innovation followers, orange the moderate innovators, and blue are the catching up countries. In grey the EU27 average. Bars indicate the value of the indicator in 2008 (except for Italy where the 2007 value has been used); black markers indicate the value of the indicator in 2004 with the exception of FR and MT (2005). For LU it is available only the 2008 value.
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

3. Graduates in Mathematics, Science and Technology

The share of population qualified to university degree level in mathematics, science or technology is an important predictor of the availability of human resources qualified to carry out research and development activities. Figure IV.2.2 shows that in 2008, 1.39% of Europeans aged 20 to 29 received a tertiary degree in mathematics, science or technology, with national performance ranging from 0.18% in Luxembourg to 2.43% in Finland. The "innovation leader" countries perform better than the EU27 average with the exception of Sweden (1.32%) and Germany (1.25%), both just below the EU27 average. The groups of "innovation follower" and "catching up" countries tend to perform below the EU27 average with a few positive exceptions: France (2.01%), Ireland (1.95%) and Romania (1.52%. Almost half of the "moderate innovator" countries perform above the EU27 average on this measure. These are: Portugal (2.07%), Lithuania (1.78%) the Czech Republic (1.5%), Slovakia (1.5%), and Poland (1.41%).

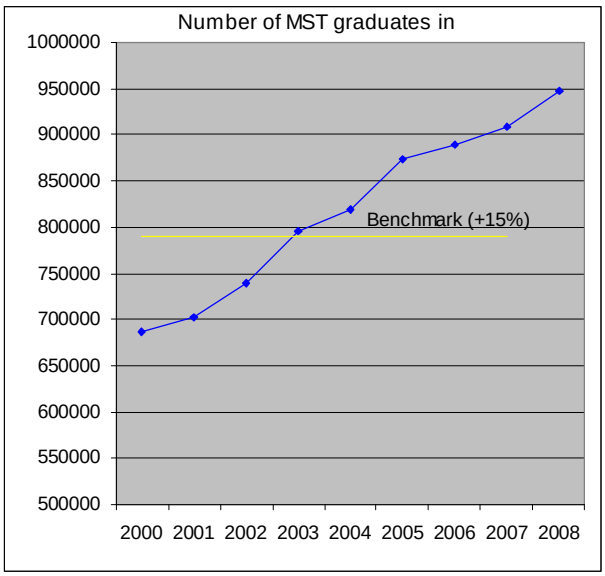
European benchmark
The total number of graduates in Mathematics, Science and Technology in the European Union should increase by at least 15% by 2010[81].

With growth of over 37% in the number of MST graduates in the period 2000-2008, the EU has already progressed at more than twice the rate foreseen by the EU benchmark for 2010 in this field. However, after strong growth in the beginning of the period, the increase decelerated somewhat after 2005. (Figure IV.3.1 and Figure IV.3.3).

In the period 2000-2008 Romania, Portugal and Slovakia showed the highest growth rates (>14%), followed by the Czech Republic and Poland (>10%). Despite the general positive trend, Belgium, Estonia and Malta showed a considerable decrease in numbers in 2008 of 12% or more.

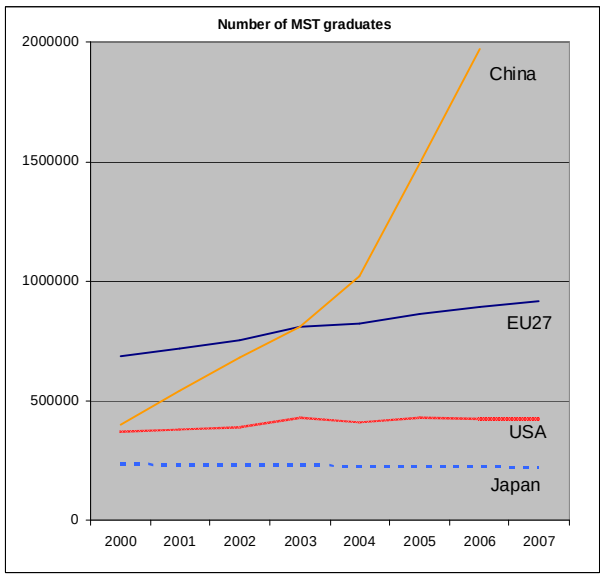
[81] Indicator: *Total number of tertiary (ISCED level 5A, 5B and 6) graduates in mathematics, science and technology. MST includes life sciences, physical sciences, mathematics and statistics, computing, engineering and engineering trades, manufacturing and processing, architecture and building*

Figure IV.3.1: Number of MST graduates (ISCED 5 and 6), 2000-2007



Source: Eurostat (UOE)

Figure IV.3.2: Total number of MST graduates - international comparison of trends, 2000-2007



Source: Eurostat and Statistical Bureau of China

While the EU progressed faster than both the US and Japan in this area (in Japan the number of graduates has decreased since 2000), growth is particularly strong in emerging economies like China, where it has more than quadrupled since 2000 to nearly 2 million in 2006[82] (Figure IV.3.2).

The availability of a large pool of MST graduates in low-wage countries could have a growing impact on high-technology industries worldwide and increasingly affect the comparative advantage (within which the relative abundance of highly skilled workers is an important factor) of developed countries.

Looking at the trend since 2000, the average number of graduates in Mathematics, Science and Technology in the EU was 10.2 per 1000 inhabitants aged 20-29 in 2000 and reached 13.9 in 2008. France, Portugal and Finland now have a relatively high population share of MST graduates, with over 20 per 1000, whereas Luxembourg, Cyprus, Malta and Hungary remain at below 8 per 1000.

The significant growth in numbers of MST graduates that has been achieved since 2000 in the EU might not continue in the coming years. In 2008 the number of MST students didn't increase anymore compared to the year before, suggesting that there will be a slowing down in the number of graduates in the years ahead. Furthermore, demographic trends, especially the decline in birth rates in the Central and Eastern European Member States after 1989, might also pose the risk of stagnation or decline in the absolute number of MST students and graduates after 2010, despite the continuing increase in higher education participation rates.

[82] Chinese figures also include ISCED 4 and hence are somewhat overstated

Figure IV.3.3: Graduates in Mathematics, Science and Technology: growth 2000-2008

	Number of graduates (in 1000)			Per 1000 inhabitants aged 20-29	Growth in graduates per year	Growth in graduates
	2000	2007	2008	2008	2000-2008	2008
EU-27	686.2	908.6	941.2	13.9	4.0	3.6
Belgium	12.9	18.5	15.6	11.6	2.2	-15.7
Bulgaria	8.1	9.3	9.8	9.1	2.5	6.3
Czech Republic	9.4	18.3	22.6	15.0	11.6	23.1
Denmark	8.5	10.1	9.7	15.5	1.7	-4.8
Germany	80.0	111.8	122.9	12.5	5.5	9.9
Estonia	1.5	2.7	2.3	11.4	5.8	-12.6
Ireland	14.5	14.0	14.6	19.5	0.1	4.8
Greece	:	13.0	16.6	11.2	:	27.6
Spain	65.1	73.1	74.7	11.6	1.7	2.1
France	154.8	166.2	163.1	20.1	0.7	-1.9
Italy	46.6	82.2	75.9	11.3	6.3	-7.7
Cyprus	0.3	0.5	0.5	4.0	5.9	-3.1
Latvia	2.4	3.1	3.1	8.8	2.9	-2.8
Lithuania	6.6	8.9	9.0	17.8	4.0	0.1
Luxembourg	0.1	:	0.1	1.8	1.3	:
Hungary	7.2	9.3	8.6	6.1	2.2	-8.1
Malta	0.2	0.4	0.4	6.0	8.6	-14.7
Netherlands	12.5	17.5	17.4	8.8	4.2	-0.7
Austria	7.5	11.6	12.5	11.8	6.6	7.6
Poland	39.2	89.3	89.7	14.1	10.9	0.5
Portugal	10.1	26.6	29.6	20.7	14.4	11.0
Romania	17.1	40.4	51.4	15.2	14.8	27.4
Slovenia	2.6	2.8	3.0	10.7	1.9	7.1
Slovakia	4.7	10.9	13.5	15.0	14.0	24.3
Finland	10.1	12.4	16.1	24.3	6.0	29.5
Sweden	13.0	14.8	14.7	13.2	1.6	-0.9
United Kingdom	140.6	140.6	144.0	17.6	0.3	2.4
Croatia	:	4.1	6.2	10.1	:	48.7
Iceland	0.4	0.5	0.5	10.4	4.3	7.7
MK*	1.2	1.5	2.0	6.1	6.7	33.2
Turkey	57.1	89.8	97.5	7.6	6.9	8.6
Liechtenstein	:	0.0	0.05	7.0	:	-32.6
Norway	4.8	5.3	5.4	9.2	1.3	1.2
USA	369.4	423.6	428.3	10.1	1.9	1.1
Japan	236.7	221.1	214.4	14.3	-1.2	-3.0

Source: DG EAC, calculations based on Eurostat (UOE) data, EU 27 figure estimated for 2008

*MK: The former Yugoslav Republic of Macedonia; see Annex 2
Average annual growth calculated on the basis of years without breaks and for which data were available.
BE: Data for the Flemish community exclude second qualifications in non-university tertiary education; the data also exclude independent private institutions (although the number is small) and the German-speaking community.
EL: No data available for 2000-2003. EU total includes an estimate for Greece for this period.
CY: Data exclude tertiary students graduating abroad. Over half of the total number of Cypriot tertiary students study abroad. The fields of study available in Cyprus are limited
LU: Luxembourg had in the reference period no complete university system, since most MST students study and graduate abroad.
HU: 2004: Changes in data collection on graduates by fields led to breaks in the time series; AT: 2000: ISCED level 5B refers to the previous year.
PL: Data for 2000 exclude advanced research programmes (ISCED level 6).
RO: 2000 data exclude second qualifications and advanced research programmes (ISCED level 6). There is therefore a break in the series in 2004.
SE: 2004: Changes in data collection on graduates by fields led to breaks in the time series.
UK: National data used for 2000; LI: 2003-2004 data exclude tertiary students graduating abroad. The fields of study available in Liechtenstein are limited

3.1 Evolution of the number of MST students

The number of tertiary MST *students* (as opposed to *graduates* discussed above) has increased by about 18% since 2000, or on average by 2.1% per year (Figure IV.3.4). Growth has been particularly strong in Malta, Cyprus and Romania. For some countries, however, the number of MST students stagnated or even declined. The latter was the case in Austria (partly a result of the introduction of tuition fees in 2001/02), Belgium, Spain and Sweden). Growth in the number of students has been slower than growth in the number of graduates since an increasing share of students proceed to take postgraduate degrees. In the EU, MST students accounted in 2008 for nearly a quarter (24%) of the total student population.

Figure IV.3.4: Number of MST students (ISCED level 5 and 6), 2000-2008

	Number of tertiary MST students (in 1000)			Ø Growth per year
	2000	2007	2008	2000-08
EU-27	**3930e**	**4638**	**4632**	**2.1**
Belgium	74.6	62.9	64.4	-1,8
Bulgaria	64.5	64.3	64.8	0,0
Czech Republic	74.5	83.2	103.7	4,2
Denmark	38.3	43.6	41.6	1,0
Germany	587.2	701.2	695.4	2,1
Estonia	11.4	15.8	15.4	3,8
Ireland	45.3	40.6	45.2	0,0
Greece	:	184.5	195.1	3,3
Spain	525.1	499.8	491.9	-0,8
France	:	549.4	547.9	4,0
Italy	433.2	477.6	461.1	0,8
Cyprus	1.8	4.2	4.5	12,0
Latvia	15.1	20.2	20.2	3,7
Lithuania	33.4	48.1	48.0	4,6
Luxembourg	0.4	:	0.7	7,1
Hungary	65.7	79.2	80.0	2,5
Malta	0.7	1.8	1.6	10,6
Netherlands	80.8	85.2	86.3	0,8
Austria	73.9	64.4	72.7	-0,2
Poland	285.2	473.1	462.0	6,2
Portugal	102.2	108.5	112.4	1,2
Romania	124.2	217.0	233.0	8,2
Slovenia	19.7	25.8	27.8	4,4
Slovakia	38.1	53.6	53.8	4,4
Finland	97.9	113.3	111.0	1,6
Sweden	106.0	105.4	100.6	-0,7
United Kingdom	477.4	515.2	491.3	0,4
Croatia	:	32.9	33.5	:
Iceland	1.7	2.5	2.7	5.9
MK*	12.0	14.1	15.3	3.1
Turkey	301	506.3	520.4	7.1
Liechtenstein	:	0.2	0.2	:
Norway	26.9	34.1	34.1	3.0
USA	:	2764.7	3031.4	:
Japan	819.4	754.0	733.0	-1.4

Source: Eurostat (UOE)

*MK: The former Yugoslav Republic of Macedonia; see Annex 2
Annual growth per year represents geometric mean.

Additional notes:
Number of students means the total number of full-time and part-time students. Austria: Break in time series in 2003; before 2003 Austria reported students studying more than one field in each of the fields in which they were enrolled, leading to double-counting; since 2003 students have been allocated to only one field. Italy: 2008 does not include MST students at the ISCED 6 level. The EU total for 2003 includes Greece (with 2002 data).

3.2 Evolution of the number of MST graduates by field and educational levels

Growth since 2000 has been very strong in computing (over 80%), while manufacturing, mathematics and architecture showed also robust growth rates. Growth was much slower in engineering, in life sciences and in physical science (Figure IV.3.5).

However, it has to be taken into account that computing has also some of the elements taught in physical science and in mathematics. The lower growth or decline in these fields can partly be attributed to a shift to informatics. There is also a trend to new interdisciplinary studies that are difficult to classify but which impact on the growth of certain fields.

Figure IV.3.5: Number of graduates by field within MST (EU 27)

ISCED field	Graduates (1000)		Growth (in %) 2000-08
	2000	2008	
Life sciences (42)	91.1	97.4	6.8
Physical science (44)	88.9	98.0	10.3
Mathematics, statistics (46)	36.5	49.4	35.3
Computing (48)	86.2	156.0	81.0
Engineering (52)	267.5	312.7	16.9
Manufacturing (54)	31.5	47.2	50.0
Architecture, building (58)	86.5	126.8	46.6

Source: Eurostat; in the case of physical science and computing, no data are available for Romania. Includes estimates for Greece for 2000 and Ireland for 2007.

3.3 Evolution of the number of MST graduates by type of programme

The academic programmes requiring an ISCED level 5A second (masters level) degree grew strongly between 2000 and 2008, while the number of new PhDs (ISCED 6 level) increased, but more moderately (see Figure IV.3.6). Occupation oriented degrees at the same time showed overall only slow growth.

Figure IV.3.6: Growth in the number of MST graduates by type of programme

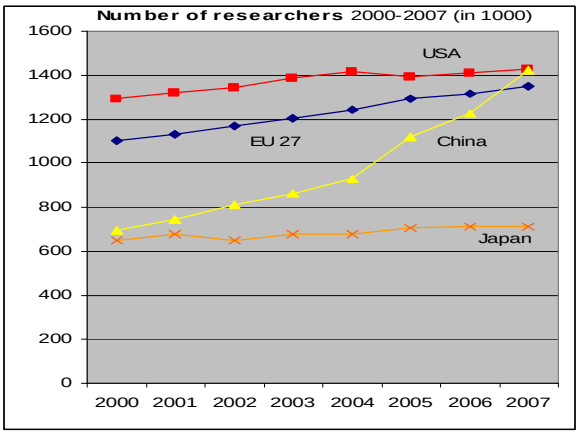
ISCED field	Graduates (in 1000)		Growth (in %) 2000-2008
	2000	2008	
Academic programmes, all first degrees (5A)	452.4	586.1	29.6
Academic programmes, second degree (5A)	59.5	152.0	155.5
Occupation-oriented programmes, first qualification (5B)	131.3	140.2	6.8
Occupation-oriented programmes, second qualification (5B)	2.1	0.5	-74.6
Second stage leading to an advanced research qualification (6)	35.7	45.8	28.3

Source: Eurostat (UOE), Note: PHD/Doctorate represent over 95% of all ISCED 6 degrees

3.4 MST Graduates and researchers on the labour market

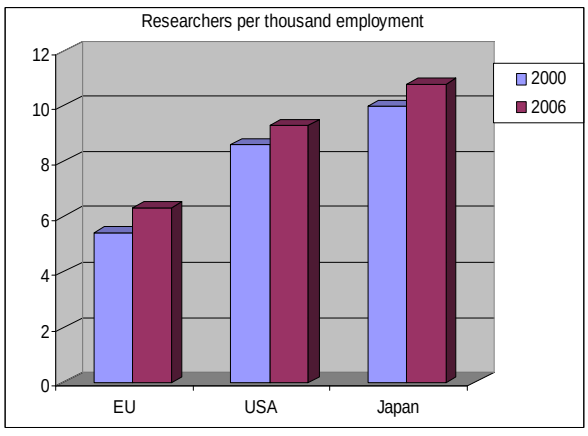
In 2007 about 45 000 or 5% of MST graduates in the EU were PhD graduates (ISCED level 6), compared with 5.3% in the USA and 2.9% in Japan. This represents an increase of almost 30% in the EU as compared to 2000 (Figure IV.3.7). These are graduates with research training who could be expected to proceed to positions as researchers on the labour market. The increase in MST graduates and the comparatively high share of PhD level graduates has, however, not been reflected in the relative numbers employed in research in the EU. The number of researchers (full time equivalents) in the EU increased in the period 2000-2007 by 22.5% or 250 000. Nevertheless, the EU has still fewer researchers on the labour market than the USA, both in absolute terms and as a proportion of the total labour force. In 2007 China overtook the EU in absolute terms while Japan has a much higher proportion of researchers in employment (see Figure IV.3.8). Partly as a result of a lack of career opportunities, a high share of potential researcher graduates opts for non-science and non-engineering career. Some of these graduates furthermore choose to take up positions outside the EU (European Commission, 2005b, p.12).

Figure IV.3.7: Trend in the number of researchers



Source: Eurostat (UOE)

Figure IV.3.8: Researchers per thousand total employment, 2000 and 2006



Source: Eurostat, OECD

4. Entrepreneurship

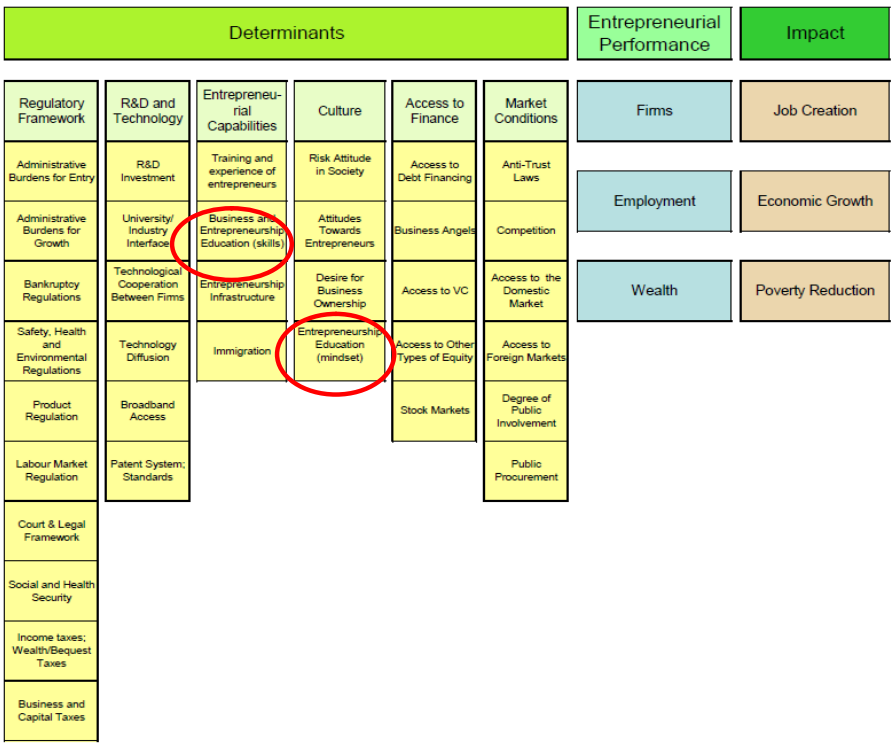
According to the "European reference framework: key competences for lifelong learning" [83], *"sense of initiative and entrepreneurship refers to an individual's ability to turn ideas into action. It includes creativity, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives. This supports individuals, not only in their everyday lives at home and in society, but also in the workplace in being aware of the context of their work and being able to seize opportunities, and is a foundation for more specific skills and knowledge needed by those establishing or contributing to social or commercial activity. This should include awareness of ethical values and promote good governance"*.

Entrepreneurship is one of the eight key competences for lifelong learning included in the recommendations of the European parliament and the Council. As a competence, entrepreneurship is based on essential knowledge, skills and attitudes:

- **Necessary knowledge for entrepreneurship** includes the ability to identify available opportunities for personal, professional and/or business activities, including 'bigger picture' issues that provide the context in which people live and work, such as a broad understanding of the workings of the economy, and the opportunities and challenges facing an employer or organisation. Individuals should also be aware of the ethical position of enterprises, and how they can be a force for good, for example through fair trade or through social enterprise.
- **Skills** relate to proactive project management (involving, for example the ability to plan, organise, manage, lead and delegate, analyse, communicate, debrief, evaluate and record), effective representation and negotiation, and the ability to work both as an individual and collaboratively in teams. The ability to judge and identify one's strengths and weaknesses, and to assess and take risks as and when warranted, is essential.
- **An entrepreneurial attitude** is characterised by initiative, pro-activity, independence and innovation in personal and social life, as much as at work. It also includes motivation and determination to meet objectives, whether personal goals or aims held in common with others, including at work.

The OECD-Eurostat Entrepreneurship Indicators Programme (EIP) aims to build a knowledge base measuring the rates at which new firms are created or close down, studying factors which allow enterprises to grow and assessing the impact of small businesses on jobs, turnover and trade. It has provided a framework for indicators on entrepreneurship (see Figure IV.4.1).

Figure IV.4.1: Framework for indicators on entrepreneurship



Source: OECD Eurostat EIP

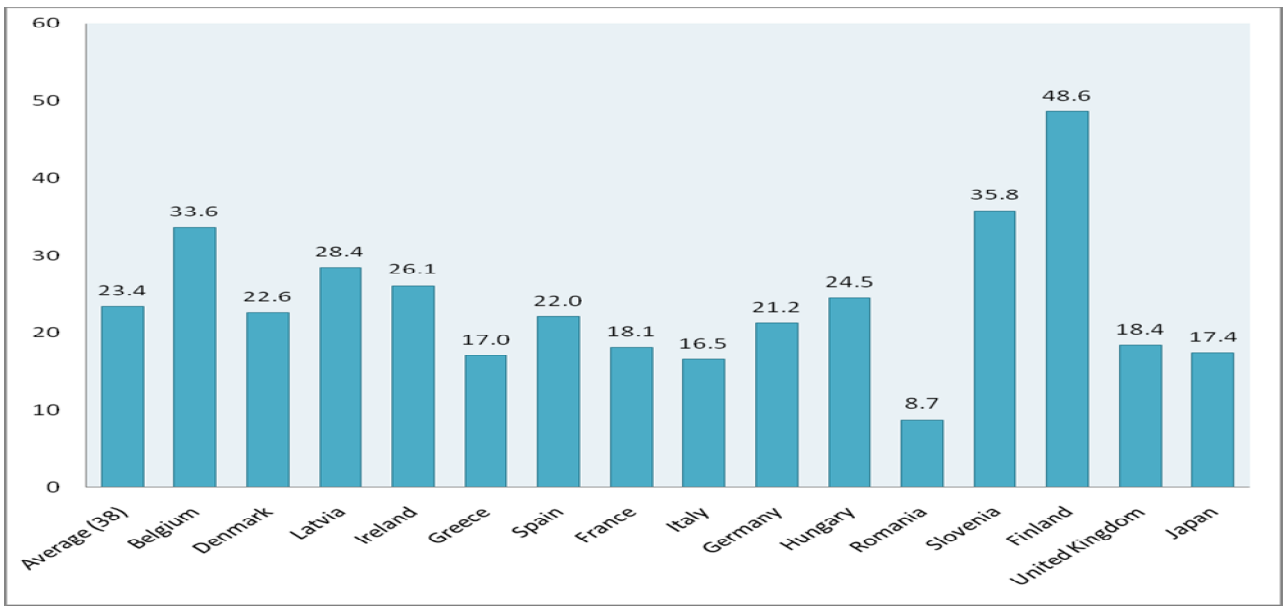
[83] European Commission, "Key Competences for Lifelong Learning - European Reference Framework". 2007. See: http://ec.europa.eu/education/lifelong-learning-policy/doc42_en.htm

4.1. Entrepreneurship education and training: analysis of existing cross-country data

Regarding entrepreneurship education, there is a clear lack of internationally comparable data.

Studies at national and European-wide level suggest that Member States where entrepreneurship is well established in the curricula for general secondary education are still a minority (ES, FI, IE, CY, PL and UK)[84]. Existing cross-country studies provide an idea on the spread of entrepreneurship education in Europe.
The European Commission launched a European survey on Higher Education Institutions (HEIs), with the aim of analysing the state of the teaching of entrepreneurship. The report, published in October 2008, provides an insight into the strengths and weaknesses of the offer of entrepreneurship education in Europe[85]. This survey, conducted in higher education institutions in 31 European Countries, reveals that over 87% of the institutions had some type of activities that could be considered entrepreneurship education. It also found that of about 22%, 27% and 21% of undergraduates, graduates and postgraduate students of those institutions were enrolled in entrepreneurship courses. Based on a questionnaire survey, the survey shows that there is already a share of population with training on starting a business. Notwithstanding this, there are high asymmetries across European countries for which data is available (Figure IV.4.2).

Figure IV.4.2: Population aged 18-64 with training in starting a business



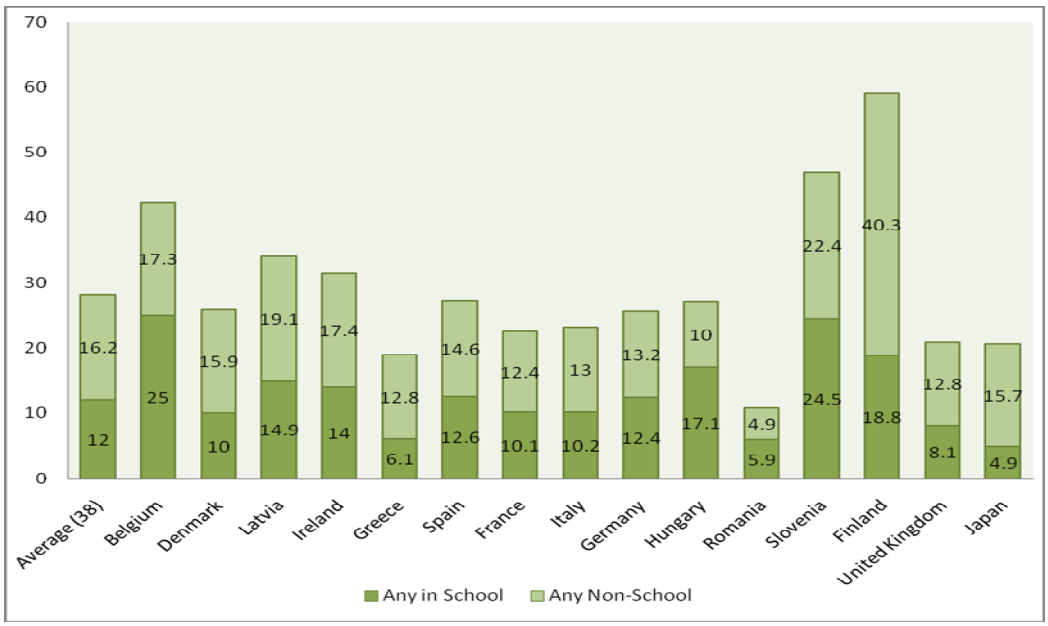
Source: Global Entrepreneurship Monitor 2008
Note: EU Countries for which data is available, Japan and Average for all 38 countries in the sample

Data on qualitative aspects of the courses is even scarcer. A significant proportion of training in entrepreneurship occurs out of school, mainly though formal as opposed to non-formal courses (Figure IV.4.3 and Figure IV.4.4).

[84] EC (2007). Assessment of the compliance with the entrepreneurship education objective in the context of the spring 2006 Council http://ec.europa.eu/enterprise/policies/sme/files/support_measures/training_education/doc/edu2006_en.pdf

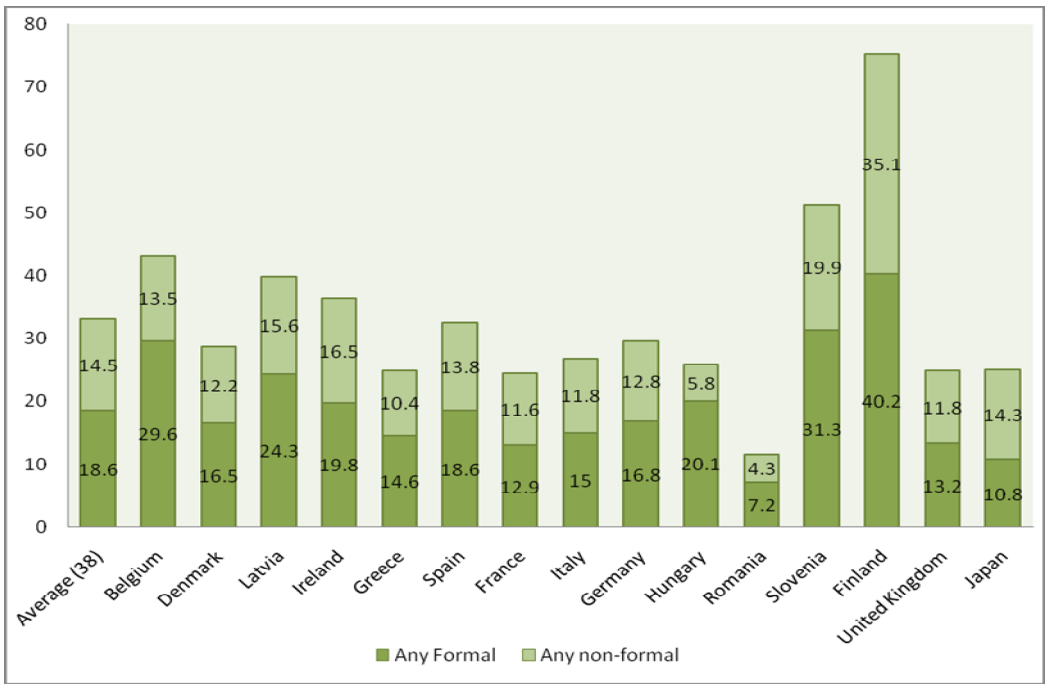
[85] European Commission (2008). *Survey on entrepreneurship in Higher Education in Europe*: http://ec.europa.eu/enterprise/policies/sme/promoting-entrepreneurship/education-training-entrepreneurship/higher-education/index_en.htm

Figure IV.4.3: Population aged 18-64 with training in starting a business in school and non-school



Source: Global Entrepreneurship Monitor 2008
Note: EU Countries for which data is available, Japan and Average for all 38 countries in the sample

Figure IV.4.4: Population aged 18-64 with training in starting a business, formal and non-formal training

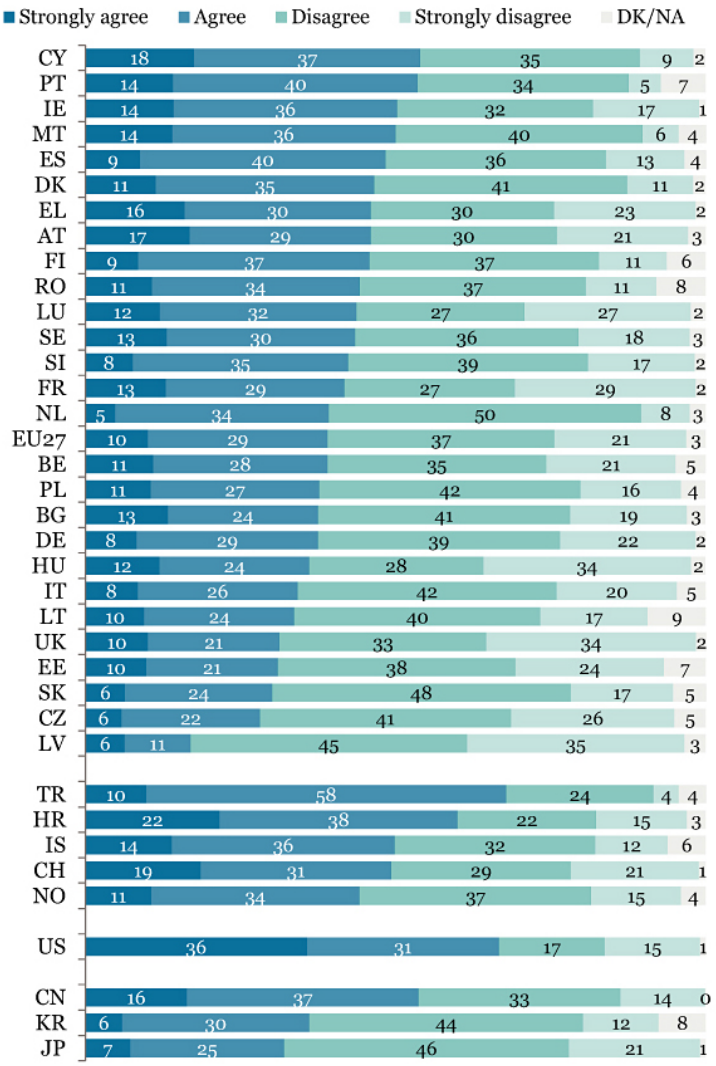


Source: Global Entrepreneurship Monitor 2008
Note: EU Countries for which data is available, Japan and Average for all 38 countries in the sample

The methods used in entrepreneurship education are diverse and include e.g. lecturing, mentoring and company visits. Entrepreneurship education can also occur through extra-curricula activities, from business plan competitions (the most common), to attendance at seminars and participation in mentoring schemes. It is common to have external stakeholders making actual contributions to the institutions entrepreneurship education (see Annex IV.7 and Ann.IV.8)

There are few data also on the impact/ effects of entrepreneurship education. With the Eurobarometer Survey on entrepreneurship, the European Commission has been monitoring the evolution of public opinion and perceptions in the EU Member States about the role of school education developing a sense of initiative and an entrepreneurial attitude. In the last Survey[86], it is interesting to notice that, between the EU Member States, only interviewees in Cyprus (55%) and Portugal (54%) agreed for the majority part that their school education gave them the necessary skills to run a business. Countries which recorded a particularly low level of agreement on this point were the Czech Republic (28%), Slovakia (30%), Estonia and the UK (31%). On the other hand, more than a third of respondents in Latvia (35%), Hungary and the UK (34%) strongly *disagreed* with this statement (see Figure IV.4.5).

Figure IV.4.5: "My school education gave me skills and know how that enable me to run a business"



Source: EU Flash Eurobarometer 283, *Entrepreneurship Survey*, 2009, p.100

[86] Flash Eurobarometer 2009 http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/eurobarometer/fl283_en.pdf

Annexes

ANNEX 1

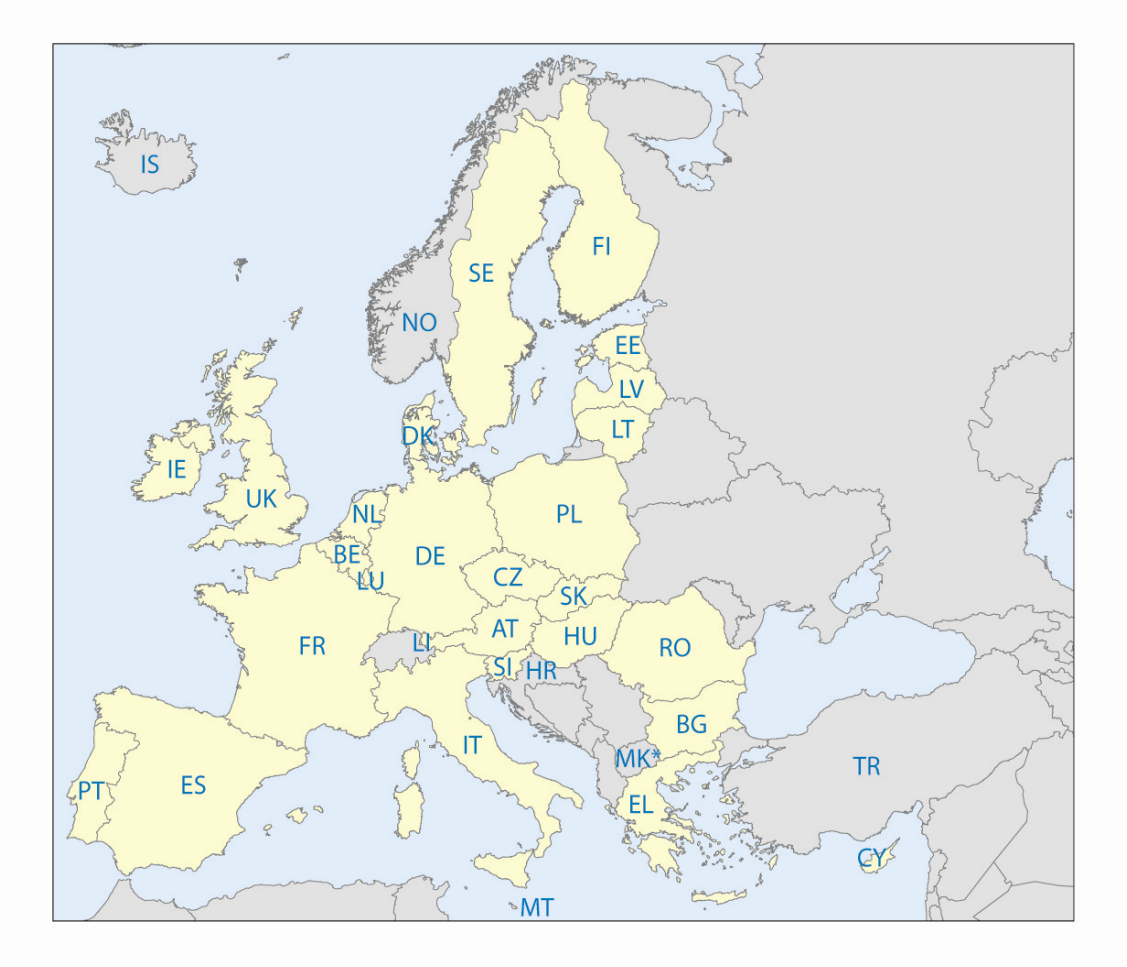
STANDING GROUP ON INDICATORS AND BENCHMARKS

Austria	Mr	Mark	**NÉMET**	Federal Ministry for Education, Arts and Culture
Belgium (Flemish community)	Ms	Isabelle	**ERAUW**	Flemish Ministry of Education and Training
Belgium (French community)	Ms	Nathalie	**JAUNIAUX**	Communauté française de Belgique
Bulgaria	Ms	Irina	**VASEVA-DUSHEVA**	Ministry of Education and Science
Cyprus	Ms	Athena	**MICHAELIDOU**	Cyprus Pedagogical Institute
Czech Republic	Mr	Vladimir	**HULIK**	Institute for Information on Education
Denmark	Mr	Liv Maadele	**MOGENSEN**	Ministry of Education
Estonia	Ms	Tiina	**ANNUS**	Ministry of Education and Research
Finland	Ms	Kirsi	**KANGASPUNTA**	Ministry of Education
France	Mr	Claude	**SAUVAGEOT**	Ministry of National Education
Germany	Ms	Daniela	**NOLD**	Statistisches Bundesamt
Germany	Mr	Jens	**FISCHER-KOTTENSTEDE**	Hessisches Kultusministerium
Germany	Ms	Suzanne	**VON BELOW**	Bundesministerium für Bildung und Forshung
Greece	Mr	Dimitrios	**EFSTRATIOU**	Ministry of National Education
Greece	Mr	Nikos	**PAPADAKIS**	Ministry of Education and Religious Affairs
Hungary	Ms	Judit	**KÁDÁR-FÜLÖP**	Ministry of Education and Culture
Iceland	Mr	Gunnar Jóhannes	**ÁRNASON**	Office of Evaluation and Analysis
Ireland	Ms	Deirdre	**DUFFY**	Department of Education and Science
Italy	Ms	Annamaria	**FICHERA**	Ministry of Education
Italy	Ms	Gianna	**BARBIERI**	Ministry of Education
Lithuania	Mr	Ri• ardas	**ALIŠAUSKAS**	Ministry of Education and Science
Luxembourg	Ms	Marion	**UNSEN**	Ministry of Education and Training
Malta	Mr	Raymond	**CAMILLERI**	Directorate for Quality and Standards in Education
Netherlands	Ms	Pauline	**THOOLEN**	Ministry of Education, Culture and Science
Norway	Mr	Oyvind	**BJERKESTRAND**	Ministry of Education and Research
Poland	Ms	Anna	**NOWOZYNSKA**	Ministry of National Education
Portugal	Mr	Nuno	**RODRIGUES**	Ministry of Education
Romania	Mr	Gabriel	**RADU**	Ministry of Education, Research and Youth
Slovakia	Mr	Jaroslav	**JURIGA**	Ministry of Education
Slovenia	Ms	Zvonka	**PANGERC PAHERNIK**	Slovenian Institute for Adult Education
Spain	Mr	Enrique	**ROCA**	Institute of Evaluation
Spain	Ms	Isabel	**ALABAU**	Institute of Evaluation
Spain	Mr	Jesús	**IBAÑEZ MILLA**	Ministry of Education and Science
Sweden	Mr	Per	**BÅVNER**	Ministry of Education and Research
United Kingdom	Mr	Steve	**LEMAN**	Department for Children, Schools and Families
United Kingdom (Scotland)	Mr	Peter	**WHITEHOUSE**	Scottish Executive
Organisations	Ms	Katja	**NESTLER**	Cedefop
	Mr	Jens	**JOHANSEN**	European Training Foundation

ANNEX 2

LIST OF ABBREVIATIONS

Country abbreviations



EU	**European Union**	RO	Romania
BE	Belgium	SI	Slovenia
BG	Bulgaria	SK	Slovakia
CZ	Czech Republic	FI	Finland
DK	Denmark	SE	Sweden
DE	Germany	UK	United Kingdom
EE	Estonia		
EL	Greece	**CC**	**Candidate Countries**
ES	Spain	HR	Croatia
FR	France	IS	Iceland
IE	Ireland	MK*	The former Yugoslav Republic of Macedonia
IT	Italy		
CY	Cyprus	TR	Turkey
LV	Latvia		
LT	Lithuania	**EEA**	**European Economic Area**
LU	Luxembourg	LI	Liechtenstein
HU	Hungary	NO	Norway
MT	Malta		
NL	Netherlands	**Others**	
AT	Austria	CH	Switzerland
PL	Poland	JP	Japan
PT	Portugal	US/USA	United States of America

* ISO code 3166. Provisional code which does not prejudge in any way the definitive nomenclature for this country, which will be agreed following the conclusion of negotiations currently taking place on this subject at the United Nations (http://www.iso.org/iso/country_codes/iso_3166_code_lists.htm)

General abbreviations

ACCI	the active citizenship Composite indicator
AES	Adult Education Survey
ALL	Adult Literacy and Life-skills Survey
ARWU	The *Academic ranking of World Universities*
CLA	Classification of Learning Activities
CEDEFOP	European Centre for the Development of Vocational Training Centre européen pour le développement de la formation professionnelle
CEPES	Centre Européen pour l'enseignement supérieur/ European Centre for Higher Education (UN organisation based in Bucharest)
CEPS	Centre for European Policy Studies
CHE	Centre for Higher Education Development
CILT	UK National Centre for Languages
CIS	Community Innovation Survey
CIVED	Citizenship Education Survey (IEA study of 1999)
CPS	Current Population Survey
CRELL	Centre for Research on Lifelong Learning (depending on JRC, European Commission)
CVET	Continuing vocational education and training
CVT	Continuing Vocational Training
CVTS	Continuing Vocational Training Survey
DEA	Data Envelopment Analysis
DTI	Danish Technological Institute
ECTS	the European Credit Transfer System
ECVET	European Credit for Vocational Education and Training
EEA	European Economic Area (EU 27+Norway, Iceland and Liechtenstein)
EIT	European Institute of Technology
EMU	European Monetary Union
ENQA	European Network of Agencies
EPL	Employment Protection Legislation
ESI	Essential Science Indicator
ETF	European Training Foundation
ESCS	Economic, social and cultural status
ESPAIR	Education par le sport de plein air contre le décrochage scolaire
ESS	European Social Survey
EQF	European Qualifications Framework
EUA	European University Association
EUR PPS	Euro in purchasing power parities (taking into account different price levels)
EURYDICE	Education Information Network in the European Community
EU-SILC	EU-Statistics on Income and Living Conditions
FTE	Full-time equivalent
GCSE	General Certificate of Secondary Education
GDP	Gross Domestic Product
GERESE	European Group of Research on Equity of Educational Systems
GED	General Education Diploma
GNP	Gross National Product
HEI	Higher Education Institution
IALS	International Adult Literacy Survey
ICCS	International Civic and Citizenship education survey
ICT	Information and Communication Technology
IEA	International Association for the Evaluation of Educational Achievement
ILO	International Labour Organisation (UN-Organisation based in Geneva)
IREG	International Ranking Expert Group
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
JRC	Joint Research Centre (European Commission)
LFS	Labour Force Survey
MEDSTAT	Regional co-operation programme between the European Union and 10 Mediterranean Countries (Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestinian Authority, Syria, Tunisia and Turkey)
MST	Maths, science and technology
NACE	Classification of Economic Activities in the European Community
NEET	Not in employment, education or training
NER	Net Enrolment Rate
NFER	National Foundation for Educational Research

NGOs	Non-government organisations
OMC	Open Method of Co-ordination
OECD	Organisation for Economic Co-operation and Development
OJC	Official Journal of the European Communities
PIAAC	Programme for the International Assessment of Adult Competencies (OECD study)
PIRLS	Progress in International Reading Literacy Survey
PISA	Programme for International Student Assessment
PLA	Peer Learning Activity
PPS	Purchasing Power Standards
R&D	Research and development
SCI	Science Citation Index
SEN	Special Educational Needs
S&E	Science and engineering
SENDDD	Statistics on students with disabilities, learning difficulties and disadvantages
SES	Socioeconomic status
SSCI	Social Science Citation Index
TALIS	Teaching and Learning International Survey (OECD study)
TAFE	Technical and Further Education College
THE	Times Higher Education
TIMSS	Trends in International Mathematics and Science Study
UIS	UNESCO Institute for Statistics (based in Montreal)
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization (based in Paris)
UOE	UIS/OECD/Eurostat (common data collection)
VET	Vocational education and training
WUR	World University Ranking

ANNEX 3

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ANNEX 4

STATISTICAL ANNEX

Figure Annex II.1: Distribution of persons aged 20-34 who are not in formal education, by activity status and by time elapsed since completion of the highest level of education, EU27, 2009 (%)

Source: CRELL (Forthcoming) based on Eurostat (LFS) data.

Figure Annex III.1: Participation in early childhood education (between 4-years-olds and starting of compulsory primary)

	Entrance age to primary education	age range	2008	2007	2006	2005	2004	2003	2002	2001	2000
EU 27			92.3	90.7	89.7	88.4	88.0	87.8	88.0	86.8	85.6
BE	6	4-5	99.5	99.7	99.9	100.0	99.8	100.0	100.0	100.0	99.1
BG	7	4-6	78.4	79.8	80.5	82.5	83.2	83.9	81.1	73.2	73.4
CZ	6	4-5	90.9	92.6	92.6	94.4	94.0	93.7	93.7	92.0	90.0
DK	7	4-6	91.8	92.7	92.0	91.8	96.9	94.9	93.5	93.7	95.7
DE	6	4-5	95.6	94.5	93.0	86.6	85.5	86.4	88.4	87.7	82.6
EE	7	4-6	95.1	93.6	94.9	98.7	97.1	93.6	86.9	88.3	87.0
IE	4	4-5	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a
EL	6	4-5	**m**	68.2	70.9	70.8	70.6	70.6	69.2	69.3	69.3
ES	6	4-5	99.0	98.1	98.5	99.8	100.0	100.0	100.0	100.0	100.0
FR	6	4-5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
IT	6	4-5	98.8	99.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0
CY	6	4-5	88.5	84.7	84.7	74.7	70.8	68.1	68.3	70.4	64.7
LV	7	4-6	88.9	88.2	87.2	87.7	85.0	85.7	70.2	67.2	65.4
LT	7	4-6	77.8	76.6	75.8	71.3	69.7	68.9	64.1	61.2	60.6
LU	6	4-5	94.3	93.9	95.0	94.8	89.5	83.5	97.7	95.3	94.7
HU	6	4-5	94.6	95.1	94.5	93.9	95.1	94.7	93.3	92.5	93.9
MT	5	4	97.8	98.8	95.5	94.4	97.5	98.7	92.6	95.0	100.0
NL	5	4	99.5	98.9	74.2	73.4	74.0	73.0	99.1	98.1	99.5
AT	6	4-5	90.3	88.8	88.2	87.6	87.7	88.1	87.0	86.0	84.6
PL	7	4-6	67.5	66.8	64.0	62.1	60.9	59.6	58.4	58.5	58.3
PT	6	4-5	87.0	86.7	86.8	86.9	84.9	85.7	83.7	81.5	78.9
RO	6	4-5	82.8	81.8	81.2	81.2	80.3	73.9	72.3	68.5	67.6
SI	6	4-6	90.4	89.2	88.6	86.6	86.4	86.2	86.8	86.0	85.2
SK	6	4-5	79.1	79.4	79.4	79.7	78.3	77.2	75.4	76.4	76.1
FI	7	4-6	70.9	69.8	68.1	66.9	66.9	65.5	65.0	62.0	55.2
SE	7	4-6	94.6	94.0	91.3	92.8	92.4	89.4	86.6	85.7	83.6
UK	5	4	97.3	90.7	90.9	91.8	92.9	95.3	100.0	99.0	100.0
HR	7	4-6	68.0	65.2	61.9	59.1	55.9	54.1	n.a.	n.a.	n.a.
IS	6	4-5	96.2	95.4	95.7	95.8	95.5	94.5	93.5	93.3	91.8
MK*	6-7	4-5	28.5	26.1	24.6	22.9	21.0	20.9	17.7	17.3	17.4
TR	6	4-5	34.4	26.7	23.2	18.6	14.8	14.5	13.0	11.9	11.6
LI	7	4-6	83.2	84.5	84.2	83.5	82.3	80.4	n.a.	n.a.	69.3
NO	6	4-5	95.6	94.3	92.4	90.0	88.0	85.4	83.1	81.3	79.7
CH	6-8	4-6	77.9	79.1	78.9	77.4	75.6	74.8	73.5	n.a.	n.a.
US	6	4-5	65.4	69.6	68.2	71.5	70.6	71.1	75.2	74.8	69.9
JP	6	4-5	97.0	96.4	95.6	96.8	95.9	94.9	94.5	94.9	95.5

Source: Eurostat (UOE)
Data on population extracted in May 2010
UK: break in series between 2002 and 2003 due to changes in the methodology.
NL: break in series between 2003 and 2006. Different reference dates for ages.
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Figure Annex III.2: Ratio of pupils to teachers (ISCED 0)

	2008	2007	2006	2005	2004
EU 27	**13.7**	**14.1**	**14.2**	**14.2**	**14.9**
BE	15.9	16.0	16.0	16.1	15.6
BG	11.4	11.4	11.5	11.5	11.5
CZ	13.7	13.6	12.5	13.5	13.4
DK	6.2	6.0	na	6.6	6.9
DE	13.8	14.4	14.3	13.9	13.9
EE	na	na	8.3	7.1	7.1
IE	na	na	na	na	8.9
EL	na	11.9	12.4	12.5	12.7
ES	13.1	13.7	14.0	14.1	13.9
FR	19.0	19.2	19.3	19.3	18.8
IT	11.2	11.8	12.4	12.4	12.5
CY	17.6	17.7	18.1	18.5	18.7
LV	10.6	10.9	13.5	14.4	13.9
LT	7.5	7.8	8.9	8.4	8.2
LU	12.2	12.6	na	na	na
HU	10.9	10.8	10.7	10.7	10.5
MT	13.2	na	12.7	11.2	na
NL	na	na	na	na	na
AT	16.3	16.4	16.8	17.0	17.4
PL	18.8	18.6	18.0	17.9	na
PT	14.7	15.9	15.0	15.4	16.5
RO	17.4	17.8	18.2	18.3	18.4
SI	9.4	9.4	9.4	9.6	na
SK	13.3	13.4	13.5	13.6	12.5
FI	11.4	11.4	12.0	12.5	12.7
SE	6.1	11.6	11.4	11.9	11.2
UK	17.9	13.2	14.9	11.9	12.7
HR	12.6	12.4	12.2	12.6	10.2
IS	7.2	7.1	6.9	na	6.7
MK*	7.5	11.3	10.8	11.5	11.3
TR	27.1	25.9	26.3	19.7	18.7
LI	10.8	11.1	13.1	13.2	15.5
NO	na	na	na	na	na
CH	na	na	na	na	na
US	13.4	10.3	10.2	10.6	10.5
JP	16.5	16.8	17.0	17.4	17.7

Source: IT 2008 only public sector
EU27: EE, IE, EL and NL not included
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Figure Annex III.3: Early leavers from education and training (Percentage of the population aged 18-24 with at most lower secondary education and not in further education or training)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
EU 27	17.6 *(e)*	17.2 *(e)*	17	16.6 *(b)*	16.1	15.8	15.5	15.1	14.9	14.4
Belgium	13.8	13.8	14.1	14.3	13.1 *(b)*	12.9	12.6	12.1	12	11.1
Bulgaria	:	20.5	20.7	21.9	21.4	20.4	17.3	14.9	14.8	14.7
Czech Republic	:	:	5.7	6.5 *(b)*	6.3	6.2	5.1	5.2	5.6	5.4
Denmark	11.7	9.2	9	10.4 *(b)*	8.8	8.7	9.1	12.5 *(b)*	11.5	10.6
Germany	14.6	12.3	12.5	12.8 *(i)*	12.1	13.5 *(b)*	13.6	12.5	11.8	11.1
Estonia	15.1	14.4	13.2	12.9	13.1	13.4	13.5	14.4	14	13.9
Ireland	:	:	14.6	13.1 *(b)*	13.1	12.5	12.1	11.6	11.3	11.3
Greece	18.2	17.1	16.5	16 *(b)*	14.7	13.6	15.5	14.6	14.8	14.5
Spain	29.1	29.7	30.7	31.6	32	30.8 *(b)*	30.5	31	31.9	31.2
France	13.3	13.5	13.4	13.2 *(b)*	12.8	12.2	12.4	12.6	11.9	12.3
Italy	25.1	25.9	24.2	23.0	22.3	22.0	20.6	19.7	19.7	19.2
Cyprus	18.5	17.9	15.9	17.3 *(b)*	20.6	18.2 *(b)*	14.9	12.5	13.7	11.7
Latvia	:	:	16.9	18	14.7	14.4	14.8	15.1	15.5	13.9
Lithuania	16.5	14.9	13.4 *(b)*	11.4	10.5 *(b)*	8.1	8.2	7.4	7.4	8.7
Luxembourg	16.8	18.1	17	12.3 *(b)*	12.7	13.3	14	12.5	13.4	7.7 *(b)*
Hungary	13.9	13.1	12.2	12 *(b)*	12.6	12.5	12.6	11.4	11.7	11.2
Malta	54.2	54.4	53.2	49.9	42.1 *(b)*	38.9	39.9	38.3	39	36.8
Netherlands	15.4	15.1	15.3	14.3 *(b)*	14.1	13.5	12.6	11.7	11.4	10.9
Austria	10.2	10.2	9.5	9 *(b)*	9.5 *(i)*	9.1	9.8	10.7	10.1	8.7
Poland	:	7.4	7.2	6	5.6 *(b)*	5.3	5.4	5	5	5.3
Portugal	43.6	44.2	45.0	41.2	39.4 *(b)*	38.8	39.1	36.9	35.4	31.2
Romania	22.9	21.7	23	22.5	22.4 *(b)*	19.6	17.9	17.3	15.9	16.6
Slovenia	:	6.4	5.1	4.6 *(u)*	4.3 *(u)*	4.9 *(u)*	5.6	4.1 *(u)*	5.1 *(u)*	5.3 *(u)*
Slovakia	:	:	6.7	5.3 *(b)*	6.8	6.3	6.6	6.5	6	4.9
Finland	9 *(i)*	9.5 *(i)*	9.7 *(i)*	10.1 *(i)*	10 *(i)*	10.3 *(i)*	9.7 *(i)*	9.1 *(i)*	9.8 *(i)*	9.9 *(i)*
Sweden	7.3	10.2 *(b)*	10	9.2 *(p)*	9.2 *(p)*	10.8 *(p)*	13 *(p)*	12.2 *(p)*	12.2 *(p)*	10.7 *(p)*
United Kingdom	18.2	17.8	17.6	12.1 *(b)*	12.1	11.6	11.3	16.6 *(b)*	17	15.7
Croatia	:	:	8	7.9	5.4	5.1 *(u)*	4.7 *(u)*	3.9 *(u)*	3.7 *(u)*	3.9 *(u)*
Iceland	29.8	30.9	28.8	20.3 *(b)*	24.9	24.9	25.6	23.2	24.4	21.4
MK*	:	:	:	:	:	:	22.8	19.9	19.6	16.2
Turkey	59.3	58.2	55	53	54.5	51.7	48.8	46.9	45.5	44.3
Liechtenstein	:	:	:	:	:	:	:	:	:	:
Norway	12.9	8.9	13.5	6.3 *(b)*	4.7	4.6	17.8 *(b)*	18.4	17	17.6
Switzerland	7.3	6.6	6.7	9.7 *(b)*	9.5	9.7	9.6	7.6	7.7	9.2

Source: Eurostat (UOE)
:=Not available e=Estimated value b=Break in series i=See explanatory text u=Unreliable or uncertain data p=Provisional value
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Figure Annex III.4: Participation in informal learning by learning method (rates)

Country	Total	Learn from a family member, friend or colleague	Learn using printed materials	Learn using computers	Learn through television/radio/video	Learn by guided tours of museums, historical/natural/ industrial sites	Learn visiting learning centres (including libraries)
EU	46.5	19.2	35	26.9	18.3	10.4	8.1
BE	34.9	15.2	22.5	24.3	7.1	4.8	7.4
BG	28	8.6	18.3	17.8	13.1	2	3.2
CZ	54.7	18.9	42.1	33.2	29	8.5	6.5
DE	52.4	18.8	40.4	33.9	15.8	8	6.8
EE	44.8	27.2	28.9	27	22.6	15.9	14.4
EL	20.7	5.6	16.3	11.8	8.3	2	2.4
ES	28	11.1	16.6	15.7	6.7	5.2	5.1
FR	63.8	26.5	46.1	42.1	39.8	24.6	17.1
IT	41.2	24	26.6	23	15.1	13.3	4.6
CY	63.6	33.3	44.7	22.8	32.7	8.7	5.1
LV	53.9	33.1	41.3	28.3	36.8	10.5	11.3
LT	45.3	20.7	32.7	23.9	16.4	3.9	9.6
HU	26.2	11.6	18.6	15.2	16.4	6.2	5.7
NL	:	:	:	:	:	:	:
AT	75.7	44.1	61.7	43.1	38.4	31.5	14.4
PL	25.4	9	20.5	17.1	11.3	3.2	6.4
PT	38.9	24.4	22.2	20.5	10.1	5.3	3.4
SI	62	26.8	45.8	41.7	26.7	20	26.1
SK	84.1	38.5	67.6	51.5	69.8	19.7	20.5
FI	54.6	17.3	38.3	32.1	12.1	11	27.8
SE	76	43.9	60.2	54.9	25.4	22.6	23.5
UK	53.7	14.3	50.4	19	13	3.3	5.7
HR	44.6	24.8	30.1	27.1	25.4	8	9.8
NO	72.3	45.5	51.6	47.5	26.6	19.7	18.1

Source: Eurostat (AES)
Note: Data for Poland not included in the EU average because of the very high non response rate.

Figure Annex III.5: Numbers of pupils enrolled at ISCED 3 level by sex and by programme orientation – 2008

Country	Total		Males		Females	
	general	vocational and pre vocational	general	vocational and pre vocational	general	vocational and pre vocational
EU 27	49.7	50.3	44.3	55.7	55.3	44.7
Belgium	27.1	72.9	27.0	73.0	27.1	72.9
Bulgaria	47.7	52.3	38.4	61.6	57.7	42.3
Czech Republic	25.8	74.2	20.7	79.3	30.9	69.1
Denmark	52.0	48.0	44.9	55.1	58.9	41.1
Germany	42.5	57.5	36.9	63.1	48.8	51.2
Estonia	68.0	32.0	57.1	42.9	78.4	21.6
Ireland	66.1	33.9	68.2	31.8	64.1	35.9
Greece	69.1	30.9	61.5	38.5	77.3	22.7
Spain	56.2	43.8	53.5	46.5	58.6	41.4
France	55.8	44.2	50.4	49.6	61.4	38.6
Italy	40.6	59.4	29.9	70.1	52.0	48.0
Cyprus	87.4	12.6	78.9	21.1	96.1	3.9
Latvia	65.2	34.8	58.0	42.0	72.2	27.8
Lithuania	73.7	26.3	67.3	32.7	80.3	19.7
Luxembourg	37.9	62.1	34.6	65.4	41.2	58.8
Hungary	75.6	24.4	70.2	29.8	81.2	18.8
Malta	49.9	50.1	38.9	61.1	63.0	37.0
Netherlands	32.9	67.1	31.0	69.0	34.8	65.2
Austria	22.9	77.1	18.6	81.4	27.9	72.1
Poland	53.8	46.2	43.6	56.4	65.2	34.8
Portugal	69.3	30.7	65.6	34.4	72.6	27.4
Romania	35.2	64.8	28.2	71.8	42.6	57.4
Slovenia	35.5	64.5	28.6	71.4	42.8	57.2
Slovak Republic	27.7	72.3	22.6	77.4	32.7	67.3
Finland	32.1	67.9	28.8	71.2	35.1	64.9
Sweden	43.2	56.8	39.8	60.2	46.3	53.7
United Kingdom	68.6	31.4	68.7	31.3	68.5	31.5
Croatia	27.1	72.9	20.0	80.0	34.2	65.8
Iceland	65.9	34.1	60.2	39.8	71.1	28.9
MK*	40.2	59.8	34.9	65.1	46.2	53.8
Turkey	61.0	39.0	58.4	41.6	64.3	35.7
Liechtenstein	21.7	78.3	15.0	85.0	31.3	68.7
Norway	44.8	55.2	37.2	62.8	53.0	47.0
Switzerland	35.2	64.8	29.0	71.0	42.5	57.5
United States	:	:	:	:	:	:
Japan	76.0	24.0	73.3	26.7	78.9	21.1

Source: Eurostat
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Figure Annex III.6: Average number of foreign languages learned per pupil in primary education (ISCED I) in 2000 and 2008

	2000	2008
EU 27	0.5	1.0
Belgium	0.4	0.4
Belgium (fr)	0.4	0.5
Belgium (nl)	0.3	0.3
Bulgaria	0.2	0.8
Czech Republic	0.4	0.7
Denmark	:	0.7
Germany	0.2	0.6
Estonia	1.1	1.1
Ireland	0.0	0.0
Greece	:	1.4
Spain	0.8	1.0
France	0.5	:
Italy	0.6	1.0
Cyprus	0.5	0.6
Latvia	0.5	0.8
Lithuania	0.3	0.6
Luxembourg	1.8	1.8
Hungary	:	0.5
Malta	1.0	:
Netherlands	:	0.3
Austria	0.9	:
Poland	0.7	0.8
Portugal	:	:
Romania	0.6	0.6
Slovenia	:	0.5
Slovakia	0.4	0.6
Finland	0.8	0.8
Sweden	0.9	1.1
United Kingdom	:	1.0
Croatia	:	:
Iceland	0.5	0.8
MK*	0.0	0.6
Turkey	:	:
Norway	1.0	1.0

Source: Eurostat, UOE
*MK: The former Yugoslav Republic of Macedonia; see Annex 2
For notes see:
http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Foreign_language_learning_statistics

Figure Annex III.7: Average number of foreign languages learned per pupil in general lower and upper secondary education, and in pre-/vocational programmes in upper secondary education in 2000 and 2008

Country	ISCED level 2 General 2000	ISCED level 2 General 2008	ISCED level 3 General 2000	ISCED level 3 General 2008	ISCED level 3, prevocational and vocational 2000	ISCED level 3, prevocational and vocational 2008
EU 27	1.3	1.4	0.9	1.4	0.9	1.1
Belgium	1.0	1.2	1.5	2.2	0.9	1.3
Belgium (fr)	0.7	0.9	1.0	1.8	0.5	0.8
Belgium (nl)	1.5	1.4	2.1	2.5	1.8	1.5
Bulgaria	1.1	1.3	1.2	1.8	0.7	1.5
Czech Republic	1.1	1.1	1.3	2.0	1.1	1.3
Denmark	1.7	1.9	1.3	1.6	:	0.9
Germany	1.2	1.3	0.7	1.4	0.4	0.5
Estonia	2.0	2.0	2.1	2.3	1.8	1.8
Ireland	1.0	1.0	0.9	0.9	:	1.0
Greece	:	2.0	:	1.1	0.9	0.8
Spain	1.5	1.4	1.1	1.2	1.0	1.0
France	1.5	1.5	1.6	2.0	1.0	1.1
Italy	1.1	2.0	1.2	1.3	1.1	1.4
Cyprus	:	2.0	:	1.8	1.0	1.2
Latvia	1.5	1.7	:	1.8	:	:
Lithuania	1.7	1.8	1.8	1.5	1.6	0.9
Luxembourg	2.5	2.5	2.2	3.0	1.7	2.0
Hungary	0.7	1.0	1.2	1.4	1.2	0.8
Malta	2.1	:	0.8	:	0.1	:
Netherlands	:	2.0	:	2.6	:	:
Austria	1.1	:	1.3	:	1.2	:
Poland	1.3	1.1	1.4	1.5	1.1	1.6
Portugal	:	:	:	:	:	:
Romania	1.9	2.0	1.3	2.0	1.0	1.6
Slovenia	1.0	1.4	1.5	2.0	1.3	1.3
Slovakia	1.1	1.2	1.4	2.0	1.3	1.4
Finland	2.3	2.2	:	2.7	:	:
Sweden	1.7	1.7	1.7	2.2	1.1	1.1
United Kingdom	:	1.0	:	0.6	:	:
Croatia	:	:	:	:	:	:
Iceland	2.1	2.0	1.3	1.8	0.7	0.6
MK*	1.2	1.7	1.3	:	:	:
Turkey	:	:	:	:	:	:
Norway	1.7	1.6	:	1.6	:	0.6

Source: Eurostat, UOE
*MK: The former Yugoslav Republic of Macedonia; see Annex 2
For notes see: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Foreign_language_learning_statistics

Figure Annex III.8: Proportion of pupils learning English, French, German and Spanish in lower and upper general secondary education in 2008 (% of total no. of pupils at the level)

Country	Pupils learning English at lower secondary education (Isced 2)	Pupils learning English at upper secondary education (Isced 3)	Pupils learning French at lower secondary education (Isced 2)	Pupils learning French at upper secondary education (Isced 3)	Pupils learning German at lower secondary education (Isced 2)	Pupils learning German at upper secondary education (Isced 3)	Pupils learning Spanish at lower secondary education (Isced 2)	Pupils learning Spanish at upper secondary education (Isced 3)
EU 27	91..8	76.8	26.7	22.3	11.9	20.8	9.4	15.9
Belgium	44.0	94.1	55.8	48.1	0.7	28.4	-	4.7
Belgium (fr)	38.2	90.3	-	-	1.6	6.1	0	7.3
Belgium (nl)	46.6	97.9	93.0	97.9	0	51.5	0	2.5
Bulgaria	77.6	87.2	7.1	14.8	13.0	36.7	1.5	8.3
Czech Republic	87.0	100	2.5	22.9	21.0	58.3	0.8	9.2
Denmark	99.4	91.7	10.6	10.7	78.6	55.4	0	25.4
Germany	95.6	91.4	25.5	26.8	0	0	2.8	17.0
Estonia	94.4	96.2	1.8	6.9	17.3	39.2	0.1	1.3
Ireland	0	0	65.8	58.2	20.6	16.8	11.2	11.0
Greece	99.2	95.0	54.2	8.2	41.9	3.3	0	0
Spain	97.9	94.3	38.3	27.0	2.3	1.1	0	0
France	97.2	99.4	0.0	0.0	14.9	21.5	33.9	64.0
Italy	99.8	93.9	74.9	19.9	8.6	7.0	16.0	5.7
Cyprus	99.9	89.9	93.9	34.4	1.2	2.4	0.1	11.3
Latvia	96.2	96.6	0.8	4.0	16.4	30.4	0	0.5
Lithuania	93.7	88.1	3.6	4.4	18.6	22.6	0	0.4
Luxembourg	54.5	95.5	100	95.5	100	95.5	0	7.6
Hungary	59.7	78.0	0.6	6.6	37.8	49.4	0.1	2.2
Malta	-	-	-	-	-	-	-	-
Netherlands	-	100	-	70.5	-	85.8	-	0
Austria	-	-	-	-	-	-	-	-
Poland	76.7	80.6	1.2	8.2	25.6	48.9	0.2	1.3
Portugal	-	-	-	-	-	-	-	-
Romania	97.3	96.5	86.9	83.4	10.2	12.5	0.5	2.6
Slovenia	96.9	97.1	2.8	10.9	33.5	72.1	2.0	8.6
Slovakia	74.2	98.0	1.9	16.5	31.0	69.5	0.2	6.0
Finland	99.3	99.0	6.4	18.3	12.5	29.2	0	11.1
Sweden	100	99.9	16.3	20.8	21.6	27.6	35.6	42.3
United Kingdom	-	0	-	32.3	-	11.8	-	8.2
Croatia	-	-	-	-	-	-	-	-
Iceland	99.3	73.4	1.9	15.0	3.2	26.4	3.6	20.8
MK*	98.4	-	46.7	-	26.5	-	-	-
Turkey	-	-	-	0.7	-	-	-	-
Norway	100	97.9	15.1	15.2	24.1	24.2	25.0	19.8

Source: Eurostat, UOE
*MK: The former Yugoslav Republic of Macedonia; see Annex 2
For notes see: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Foreign_language_learning_statistics

Figure Annex III.9: Knowledge of two or more languages by ISCED level (%) in adult population (25-64)

	No ISCED	ISCED 0-2	ISCED 3-4	ISCED 5-6
EU	**28.5**	**11.3**	**28.3**	**52.4**
Belgium	51.5	24.8	54	75
Bulgaria	25.9	3.4	25.6	50.5
Czech Republic	33.5	9.8	29.8	72.3
Denmark	52.1	36.6	53.3	64.8
Germany	30.2	16	25.1	52.2
Estonia	55.9	31.6	49.5	75.7
Ireland	:	:	:	:
Greece	11.9	2.1	11.9	28.7
Spain	17.9	7.3	21.2	33.6
France	22.9	11.6	18.8	44
Italy	27.6	8.5	41.6	57.1
Latvia	54.9	25.7	48.6	87
Lithuania	66.1	32.7	60.8	89.1
Luxembourg	:	:	:	:
Hungary	7.6	0.5	3.9	31.1
Netherlands	:	:	:	:
Cyprus	26	9	24.7	43.6
Austria	29.3	14.3	26.5	56.7
Poland	23.7	2.7	17.7	58.9
Portugal	26.4	12.4	56	71.7
Romania	:	:	:	:
Slovenia	71.8	43.6	73.4	90.8
Slovakia	68	39.3	64	88
Finland	67.9	46.5	60	92.7
Sweden	50.4	36	46.4	69.3
United Kingdom	0	0	0	0
Croatia	28.9	10	31.4	57
Norway	74.7	66.3	70.6	87.4

Source: Adult Education Survey 2007

Figure Annex III.10: Digital (computer) skills by gender

Percentage of Europeans (EU27) aged 16 to 74 with low, medium and high computer skills

Gender	Year	Low	Medium	High	Total
Male	2009	11	23	32	66
	2007	11	22	31	64
	2006	11	21	29	61
Female	2009	15	27	18	60
	2007	15	27	15	57
	2006	15	25	14	54

Data source: Eurostat, Information Society Statistics (July 2010).

Figure Annex III.11: Digital (computer) skills by age-group

Percentage of Europeans (EU27) aged 16 to 74 with low, medium and high computer skills

Age-group	Year	Low	Medium	High	Total
16-24	2009	14	35	43	92
	2007	13	35	41	89
	2006	13	36	37	86
25-54	2009	14	28	25	67
	2007	14	27	23	64
	2006	14	25	21	60
55-74	2009	12	15	8	35
	2007	10	13	7	30
	2006	10	11	7	28

Data source: Eurostat, Information Society Statistics (July 2010).

Figure Annex III.12: Digital (computer) skills by level of education

Percentage of Europeans (EU27) aged 16 to 74 with low, medium and high computer skills

ISCED	Year	Low	Medium	High	Total
0-2	2009	12	19	12	43
	2007	11	16	11	38
	2006	10	15	10	35
3-4	2009	14	27	24	65
	2007	13	27	23	63
	2006	13	26	22	61
5-6	2009	11	32	46	89
	2007	12	32	44	88
	2006	13	32	42	87

Data source: Eurostat, Information Society Statistics (July 2010).

Figure Annex III.13: Variation of digital (computer) skills in the period 2006-2009
Average annual variation of the percentage of individuals aged 16 to 74 with low, medium and high computer skills

	Average annual variation (values in %)			
	Low	Medium	High	Total
EU 27	**2.5**	**2.8**	**6.0**	**3.9**
Belgium	6.3	5.5	-6.5	1.6
Bulgaria	0.0	11.5	5.3	6.3
Czech Republic	-4.4	-3.1	10.7	0.6
Denmark	2.3	3.0	-6.6	-1.2
Germany	-2.0	1.1	1.2	0.4
Estonia	0.0	3.6	0.0	3.1
Ireland	-2.6	21.6	5.0	7.4
Greece	-2.4	2.3	-6.7	-2.3
Spain	0.0	3.2	6.8	4.2
France	0.0	15.0	12.6	11.6
Italy	4.0	1.9	10.6	6.0
Cyprus	-8.0	-3.9	15.1	4.2
Latvia	-11.7	4.8	12.3	2.0
Lithuania	-10.1	-1.7	19.1	4.7
Luxembourg	2.9	6.0	5.3	5.2
Hungary	11.9	1.6	2.6	4.0
Malta	14.5	-1.8	-1.6	1.4
Netherlands	-6.7	1.1	6.6	2.1
Austria	2.7	6.5	-2.2	2.0
Poland	0.0	1.8	8.4	2.9
Portugal	11.2	4.6	8.7	7.9
Romania	9.4	0.0	21.6	8.7
Slovenia	6.3	1.6	0.0	1.7
Slovakia	-1.9	3.2	7.3	3.0
Finland	6.3	-3.6	4.4	1.8
Sweden	8.5	-3.1	-11.2	-3.0
United Kingdom	7.7	0.0	3.7	3.0
Croatia	:	:	:	:
Iceland	7.2	0.9	-3.9	0.0
MK*	-4.2	11.9	38.7	5.0
Turkey	:	:	:	:
Liechtenstein	:	:	:	:
Norway	2.0	2.3	0.9	1.6

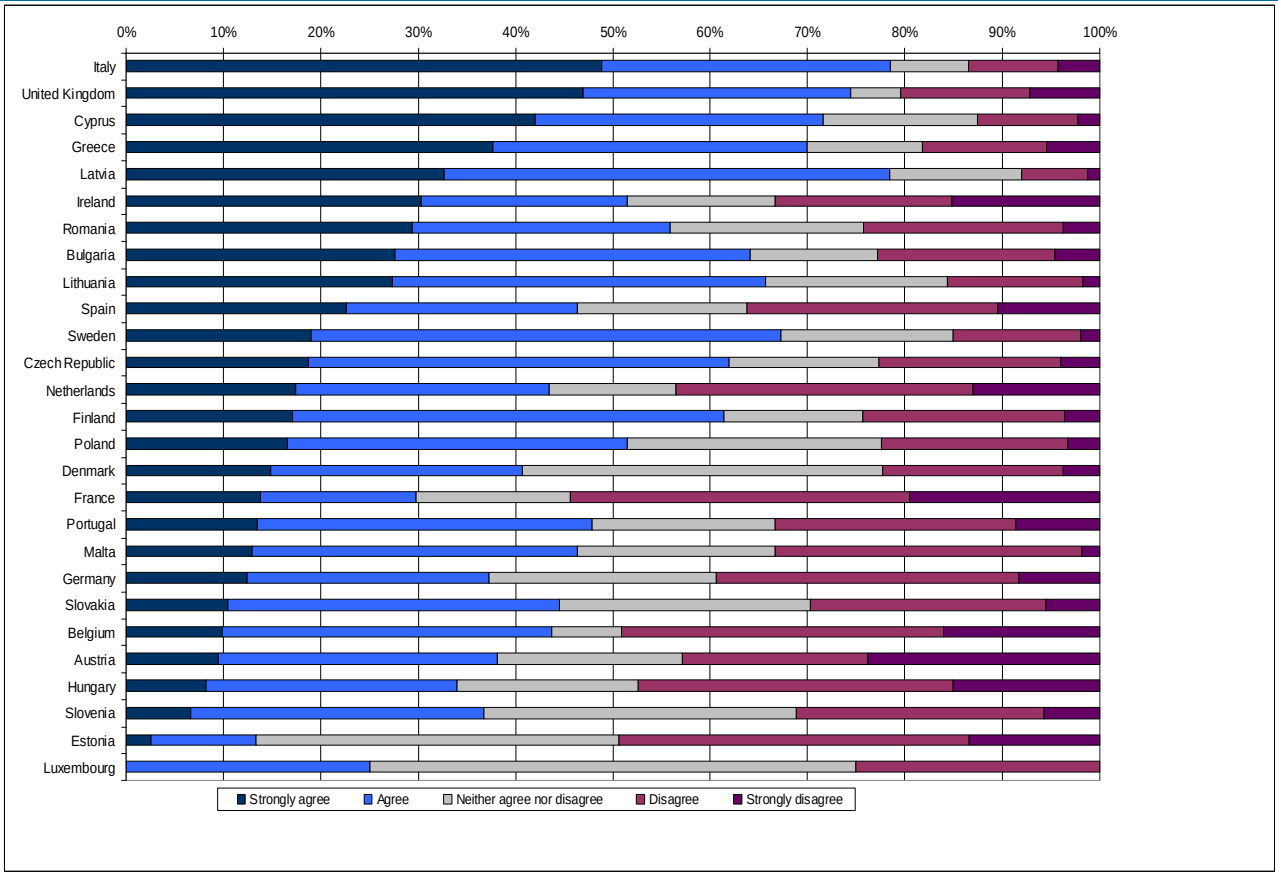
Source: CRELL, Data source: Eurostat, Information Society Statistics
(:) Missing or not available
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Figure annex III.14: average scores in PISA 2009 science and mathematics

	Science				Mathematics			
	Natives	Migrants		Difference	Natives	Migrants		Difference
		2nd generation	1st generation	Natives/ 1st gen		2nd generation	1st generation	Natives/ 1st gen
EU 18 countries	**512**	**463**	**442**	**70**	**509**	**466**	**450**	**59**
EU 25 countries	**510**	**468**	**450**	**59**	**503**	**466**	**451**	**52**
Belgium	521	447	441	80	529	459	454	75
Bulgaria	433	:	:	:	431	:	:	:
Czech Republic	502	452	498	4	494	452	490	4
Denmark	508	430	415	93	510	447	426	84
Germany	538	462	461	77	527	469	464	63
Estonia	532	489	492	40	516	479	475	41
Ireland	513	522	486	27	492	496	467	25
Greece	475	446	417	58	472	446	407	65
Spain	495	467	431	64	491	456	425	66
France	508	443	430	78	507	443	430	77
Italy	494	451	411	83	487	450	420	67
Cyprus	:	:	:	:	:	:	:	:
Latvia	495	471	:	:	483	465	:	:
Lithuania	493	468	:	:	479	461	:	:
Luxembourg	509	445	457	52	511	456	466	45
Hungary	503	530	505	-2	491	512	492	-1
Malta	:	:	:	:	:	:	:	:
Netherlands	532	466	457	75	534	477	479	55
Austria	508	434	405	103	507	450	431	76
Poland	510	:	:	:	496	:	:	:
Portugal	496	474	464	32	490	450	461	29
Romania	429	:	:	:	428	:	:	:
Slovenia	518	458	435	83	488	447	414	74
Slovakia	491	504	:	:	498	501	:	:
Finland	556	494	463	93	542	498	479	63
Sweden	506	440	408	98	507	454	416	91
United Kingdom	519	508	483	36	497	486	460	37
Croatia	489	470	460	29	462	455	447	15
Iceland	499	:	420	:	510	:	440	:
MK*	:	:	:	:	:	:	:	:
Turkey	455	:	:	:	466	:	:	:
Liechtenstein	534	502	482	52	543	526	519	24
Norway	505	443	432	73	502	463	445	57
USA	510	475	481	29	494	464	477	18
Canada	535	515	521	14	531	519	523	8
Japan	540	:	:	:	530	:	:	:
Korea	539	:	:	:	548	:	:	:
Shanghai (China)	576	:	:	:	601	:	:	:

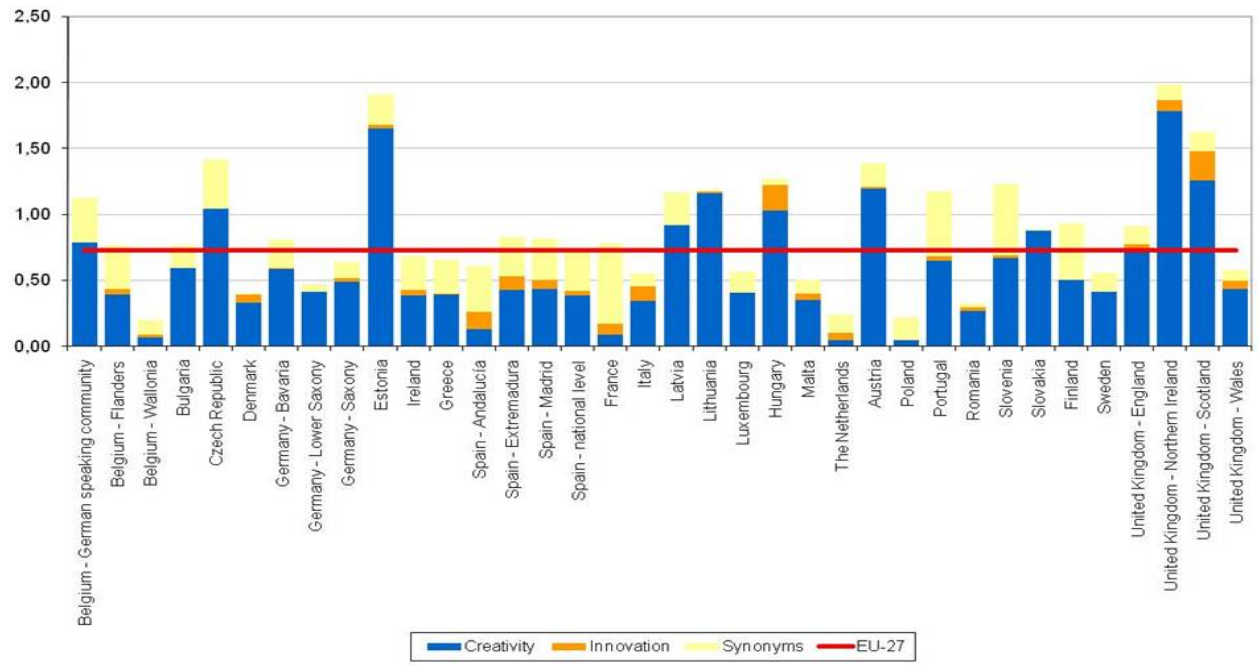
Source: OECD (PISA)
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Figure Annex IV.1: Percentage of teachers agreeing with the important role of creativity in education per country



Source: JRC/IPTS, EC/DG EAC and EUN: Online survey with teachers from EU 27

Figure Annex IV.2: Relative occurrence of Creativity, Innovation and synonyms in primary and secondary school curricula in EU27



Source: JRC/IPTS, EC/DG EAC and Empirica Gmbh (Page 18)

Figure Annex IV.3: Relative occurrence of Creativity, Innovation and synonyms in primary and secondary school curricula in EU27[87]

Country	Occurrence of CREATIVITY (1)	Occurrence of INNOVATION (2)	Occurrence of all Synonyms (3)	All terms (1)+(2)+(3)
EU 27	**0.52**	**0.03**	**0.17**	**0.73**
Belgium - German speaking community	0.79	0.00	0.33	**1.12**
Belgium - Flanders	0.39	0.04	0.33	**0.74**
Belgium - Wallonia	0.07	0.02	0.11	**0.20**
Bulgaria	0.59	0.00	0.17	**0.76**
Czech Republic	1.04	0.00	0.37	**1.41**
Denmark	0.33	0.06	0.00	**0.40**
Germany - Bavaria	0.58	0.01	0.22	**0.80**
Germany - Lower Saxony	0.41	0.00	0.05	**0.46**
Germany - Saxony	0.48	0.03	0.13	**0.64**
Estonia	1.65	0.03	0.23	**1.90**
Ireland	0.39	0.04	0.26	**0.68**
Greece	0.39	0.00	0.26	**0.66**
Spain - Andalucía	0.13	0.14	0.34	**0.60**
Spain - Extremadura	0.42	0.11	0.30	**0.83**
Spain - Madrid	0.43	0.07	0.31	**0.81**
Spain - national level	0.39	0.03	0.30	**0.72**
France	0.09	0.09	0.61	**0.78**
Italy	0.34	0.11	0.10	**0.55**
Latvia	0.92	0.00	0.25	**1.16**
Lithuania	1.16	0.01	0.01	**1.18**
Luxembourg	0.40	0.00	0.16	**0.56**
Hungary	1.02	0.20	0.05	**1.27**
Malta	0.35	0.05	0.11	**0.50**
The Netherlands	0.04	0.05	0.14	**0.24**
Austria	1.19	0.02	0.18	**1.37**
Poland	0.04	0.00	0.17	**0.22**
Portugal	0.65	0.03	0.50	**1.18**
Romania	0.27	0.03	0.03	**0.32**
Slovenia	0.67	0.02	0.54	**1.52**
Slovakia	0.88	0.00	0.01	**0.89**
Finland	0.50	0.00	0.43	**0.93**
Sweden	0.41	0.00	0.15	**0.59**
United Kingdom - England	0.73	0.04	0.14	**0.91**
United Kingdom - Northern Ireland	1.78	0.08	0.12	**1.98**
United Kingdom - Scotland	1.25	0.23	0.14	**1.62**
United Kingdom - Wales	0.43	0.06	0.08	**0.58**

Source: JRC/IPTS, EC/DG EAC and Empirica Gmbh

[87] Relative occurrences stand for the number of hits of the search terms per thousand curricula words.

Figure Annex IV 4: Summary Innovation Index 2009

Scores and growth in the last five years

	Summary Innovation Index	
	2009	Average annual variation (values in %)
EU 27	**0.478**	**1.8**
Belgium	0.516	1.6
Bulgaria	0.231	6.7
Czech Republic	0.415	4.8
Denmark	0.574	0.1
Germany	0.596	2.6
Estonia	0.481	5.5
Ireland	0.515	1.6
Greece	0.370	5.3
Spain	0.377	1.4
France	0.501	1.2
Italy	0.363	1.3
Cyprus	0.479	6.0
Latvia	0.261	4.9
Lithuania	0.313	3.0
Luxembourg	0.525	1.4
Hungary	0.328	2.2
Malta	0.343	6.0
Netherlands	0.491	1.4
Austria	0.536	1.6
Poland	0.317	2.9
Portugal	0.401	5.2
Romania	0.294	8.1
Slovenia	0.466	3.6
Slovakia	0.331	3.4
Finland	0.622	2.5
Sweden	0.636	0.7
United Kingdom	0.575	0.2
Croatia	0.286	2.2
Iceland	0.481	2.8
MK*	:	:
Turkey	0.227	5.5
Liechtenstein	:	:
Norway	0.382	1.0
Switzerland	0.694	3.3

Source: European Commission (2010a)
(:) Missing or not available
*MK: The former Yugoslav Republic of Macedonia; see Annex 2

Figure Annex IV.5: Percentage of the population aged 25 to 64 with a tertiary educational attainment (ISCED 5 and 6)

	2004[a]	2008	Average annual variation (values in %)[b]
EU 27	**21.3**	**24.0**	**3.1**
Belgium	29.8	32.5	2.2
Bulgaria	21.2	22.1	1.1
Czech Republic	12.3	14.6	4.2
Denmark	31.0	33.6	8.2
Germany	24.9	25.2	4.3
Estonia	29.8	34.2	3.6
Ireland	21.2	33.1	11.8
Greece	12.3	22.0	15.5
Spain	28.5	29.4	1.1
France	23.2	26.2	3.1
Italy	11.3	14.3	6.1
Cyprus	29.3	34.4	4.1
Latvia	19.4	25.2	6.7
Lithuania	24.2	30.4	5.9
Luxembourg	23.4	27.0	3.6
Hungary	16.5	19.0	3.6
Malta	10.7	13.2	5.4
Netherlands	28.9	31.6	2.3
Austria	18.6	18.0	-0.7
Poland	15.2	19.3	6.1
Portugal	12.7	14.3	3.1
Romania	10.4	12.9	5.4
Slovenia	18.8	22.9	5.0
Slovakia	12.6	12.7	3.9
Finland	34.0	36.6	1.9
Sweden	29.5	31.9	2.6
United Kingdom	27.9	31.7	3.3
Croatia	15.2	15.3	0.1
Iceland	27.1	30.5	3.0
MK*	13.2	13.4	0,6
Turkey	9.2	10.9	8.6
Liechtenstein	:	:	:
Norway	32.0	35.7	2.8
Switzerland	28.1	33.6	4.6

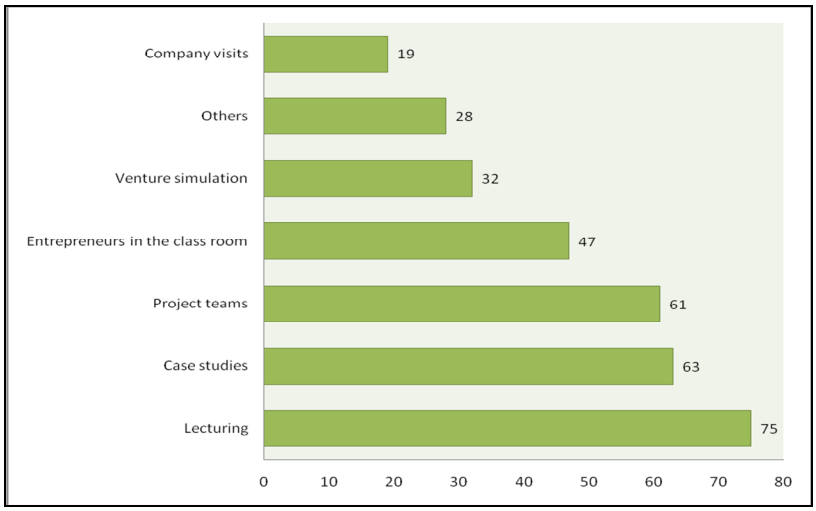
Source: CRELL based on Eurostat's LFS database (August 2010)
(:) Missing or not available
*MK: The former Yugoslav Republic of Macedonia; see Annex 2
[a] All data refers to 2004 except for DK (2007), ES and SE (2005), MK and TR (2006) due to break in series
[b] Based on the period 2008-2004 except for DK (2008-2007), ES and SE (2008-2005), MK and TR (2008-2006)

Figure Annex IV.6: Graduates in mathematics, science and technology (ISCED 5-6)
Graduates per 1000 of the population aged 25-64

	2004[a]	2008	Average annual variation (values in %)[b]
EU 27	**12.5**	**13.9**	**2.7**
Belgium	11.2	11.6	0.9
Bulgaria	8.5	9.1	1.7
Czech Republic	7.4	15.0	19.3
Denmark	13.8	15.5	2.9
Germany	9.0	12.5	8.6
Estonia	8.9	11.4	6.4
Ireland	23.1	19.5	-4.1
Greece	8.0	11.2	8.8
Spain	12.5	11.6	-1.9
France	22.8	20.1	-4.1
Italy	10.8	12.1‡	3.9
Cyprus	4.2	4.0	-1.2
Latvia	9.4	8.8	-1.6
Lithuania	17.5	17.8	0.4
Luxembourg	:	1.8	:
Hungary	5.1	6.1	4.6
Malta	3.4	6.0	20.8
Netherlands	7.9	8.8	2.7
Austria	8.7	11.8	7.9
Poland	9.4	14.1	10.7
Portugal	11.0	20.7	17.1
Romania	9.8	15.2	11.6
Slovenia	9.3	10.7	3.6
Slovakia	9.2	15.0	13.0
Finland	17.9	24.3	7.9
Sweden	15.9	13.2	-4.5
United Kingdom	18.1	17.6	-0.7
Croatia	5.4	10.1	16.9
Iceland	10.8	10.4	-0.9
MK*	3.7	6.1	13.3
Turkey	5.6	7.6	7.9
Liechtenstein	0.9	7.0	67.0
Norway	9.0	9.2	0.6
Switzerland	14.6	17.4	4.5

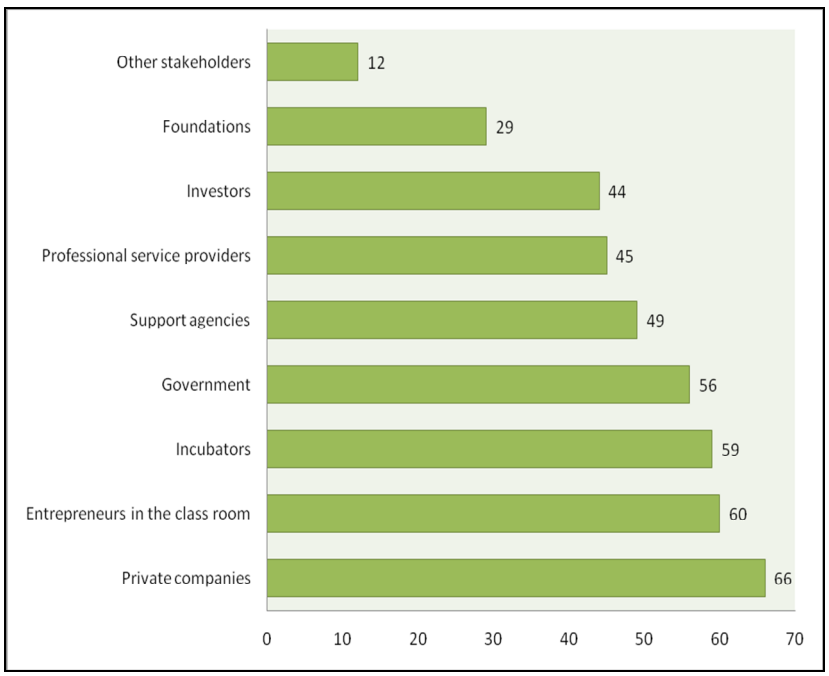
Source: Eurostat (August 2010)
(:) Missing or not available
‡ 2007 value
*MK: The former Yugoslav Republic of Macedonia; see Annex 2
[a] All data refers to 2004 except for FR and MT (2005), and IT (2007) due to break in series
[b] Based on the period 2008-2004 except for FR, MT (2008-2005) and IT (2007-2004)

Figure Annex IV.7:
Use of different teaching methods in entrepreneurship education in higher education institutions (%)



Source: European Commission (2008) Survey on entrepreneurship in Higher Education in Europe.

Figure Annex IV.8:
Links with externals stakeholders in entrepreneurship education in higher education institutions (%)



Source: European Commission (2008) Survey on entrepreneurship in Higher Education in Europe.

ANNEX 5

COUNTRY TABLES

- ***European Union***

AUSTRIA

		Austria		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		84.6%	90.3%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	19.3%	21.5%[06]	21.3%	20.0%	17.0%	15%
	Mathematics	20.0%[06]	23.2%	24.0%[06]	22.2%	-	15%
	Science	16.3%[06]	21.0%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		10.2%	8.7%b	17.6%	14.4%	10%	10%
Upper secondary attainment (age 20-24)		85.1%	86.0%	76.6%	78.6%	85%	-
MST graduates (tertiary education)	Increase since 2000	-	66.4%[08]	-	37.2%[08]	+15%	-
	Share of females	19.9%	24.2%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		(16.0%)	23.5%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		8.6%[03]	13.8 %	8.5%[03]	9.3% p	12.5%	15%
Investment in education % of GDP		5.74%	5.40%[07]	4.88%	4.96%[07]	-	-

BELGIUM

		Belgium		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		99.1%	99.5%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	19.0%	17.7%	21.3%	20.0%	17.0%	15%
	Mathematics	17.3%[06]	19.1%	24.0%[06]	22.2%	-	15%
	Science	17.0%[06]	18.0%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		13.8%	11.1% b	17.6%	14.4%	10%	10%
Upper secondary attainment (age 20-24)		81.7%	83.3%	76.6%	78.6%	85%	-
MST graduates (tertiary education)	Increase since 2000	-	20.9%[08]	-	37.2%[08]	+15%	-
	Share of females	25.0%	25.9%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		34.5%	42.0%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		8.6%[04]	6.8%	8.5%[03]	9.3% p	12.5%	15%
Investment in education % of GDP		6.0%[01]	6.02%[07]	4.88%	4.96%[07]	-	-

BULGARIA

		Bulgaria		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		73.4%	78.4%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	40.3%	41.0%	21.3%	20.0%	17.0%	15%
	Mathematics	53.3%[06]	47.2%	24.0%[06]	22.2%	-	15%
	Science	42.6%[06]	38.8%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		20.5%[01]	14.7%	17.6%	14.4%	10%	10%
Upper secondary attainment (age 20-24)		75.2%	83.7% b	76.6%	78.6%	85%	-
MST graduates (tertiary education)	Increase since 2000	-	21.8%[08]	-	37.2%[08]	+15%	-
	Share of females	45.6%	37.0%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		19.8%	27.9%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		1.3%[03]	1.4%	8.5%[03]	9.3% p	12.5%	15%
Investment in education % of GDP		3.97%	4.13%[07]	4.88%	4.96%[07]	-	-

CYPRUS

		Cyprus		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		64.7%	88.5%[08]	85.6%	92.3%[08]		95%
Low achievers (15 year-olds; PISA study results)	Reading	-	-	21.3%	20.0%	17.0 %	15%
	Mathematics	-	-	24.0%[06]	22.2%	-	15%
	Science	-	-	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		18.5%	11.7% b	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		79.0%	87.4%	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	58.3%[08]	-	37.2%[08]	+15 %	-
	Share of females	31.0%	37.4%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		31.1%	44.7%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		7.9%[03]	7.8 % b	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		5.35%	6.93%[07]	4.88%	4.96%[07]	-	-

CZECH REPUBLIC

		Czech Republic		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		90.0%	90.9%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	17.5%	23.1%	21.3%	20.0%	17.0 %	15%
	Mathematics	19.2%[06]	22.3%	24.0%[06]	22.2%	-	15%
	Science	15.5%[06]	17.3%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		5.7%[02]	5.4%b	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		91.2%	91.9%	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	141.3%[08]	-	37.2%[08]	+15 %	-
	Share of females	27%	30.1%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		13.6%	17.5%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		5.1%[03]	6.8%	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		3.97%	4.13%[07]	4.88%	4.96%[07]	-	-

DENMARK

		Denmark		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		95.7%	91.8%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	17.9%	15.2%	21.3%	20.0%	17.0 %	15%
	Mathematics	13.6%[06]	17.1%	24.0%[06]	22.2%	-	15%
	Science	18.4%[06]	16.6%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		11.7%	10.6%b	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		72.0	70.1% b	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	14.3%[08]	-	37.2%[08]	+15 %	-
	Share of females	28.5%	36.4%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		33.1%	48.1%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		24.2%[03]	31.6%	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		8.29%	7.83%[07]	4.88%	4.96%[07]	-	-

ESTONIA

		Estonia		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		87.0%	95.1%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	13.6%[06]	13.3%	21.3%	20.0%	17.0 %	15%
	Mathematics	12.1%[06]	12.6%	24.0%[06]	22.2%	-	15%
	Science	7.7%[06]	8.3%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		15.1%	13.9%	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		79.0%	82.3%	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	57.1%[08]	-	37.2%[08]	+15 %	-
	Share of females	35.7%	42.1%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		30.8%	35.9%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		6.7%[03]	10.5%	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		6.10%	4.85%[07]	4.88%	4.96%[07]	-	-

FINLAND

		Finland		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		55.2%	70.9%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	7.0%	8.1%	21.3%	20.0%	17.0 %	15%
	Mathematics	6.0%[06]	7.8%	24.0%[06]	22.2%	-	15%
	Science	4.1%[06]	6.0%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		9.0%	9.9%	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		87.7%	85.1%	76.6%	78.6%	85 %	-
MST graduates (tertiary education)	Increase since 2000	-	59.5%[08]	-	37.2%[08]	+15 %	-
	Share of females	27.3%	33.1%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		40.3%	45.9%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		22.4%[03]	22.1 %	8.5%[03]	9.3% p	12.5 %	15%
Investment in education % of GDP		5.89%	5.91%[07]	4.88%	4.96%[07]	-	-

Source: Eurostat (UOE, LFS) and OECD (PISA)

[01]= 2001, [03]= 2003, [06] = 2006, [07] =2007, [08] =2008, e= estimate, b = break, p = provisional,
PISA: reading: 18 EU countries, maths and science: 25 EU countries
"EU Benchmarks" are defined as "EU average performance levels" (weighted averages)

FRANCE

		France		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		100%	100%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	15.2%	19.8%	21.3%	20.0%	17.0%	15%
	Mathematics	22.3%[06]	22.5%	24.0%[06]	22.2%	-	15%
	Science	21.2%[06]	19.3%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		13.3%	12.3% b	17.6%	14.4%	10%	10%
Upper secondary attainment (age 20-24)		81.6%	83.6% b	76.6%	78.6%	85%	-
MST graduates (tertiary education)	Increase since 2000	-	5.4%[08]	-	37.2%[08]	+15%	-
	Share of females	30.8%	28.2%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		27.4%	43.3%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		7.1%[03]	6.0%	8.5%[03]	9.3% p	12.5%	15%
Investment in education % of GDP		6.03%	5.59%[07]	4.88%	4.96%[07]	-	-

GERMANY

		Germany		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		82.6%	95.6%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	22.6%	18.5%	21.3%	20.0%	17.0%	15%
	Mathematics	19.9%[06]	18.6%	24.0%[06]	22.2%	-	15%
	Science	15.4%[06]	14.8%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		14.6%	11.1% b	17.6%	14.4%	10%	10%
Upper secondary attainment (age 20-24)		74.4%	73.7% b	76.6%	78.6%	85%	-
MST graduates (tertiary education)	Increase since 2000	-	53.5%[08]	-	37.2%[08]	+15%	-
	Share of females	21.6%	31.1%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		25.7%	29.4%	22.4%	32.3%	-	40%
Adult participatio n in lifelong learning (age 25-64; 4 weeks period)		6.0%[03]	7.8%	8.5%[03]	9.3% p	12.5%	15%
Investment in education % of GDP		4.46%	4.50%[07]	4.88%	4.96%[07]	-	-

GREECE

		Greece		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		69.3%	68.2%[08]	85.6%	92.3%[08]		95%
Low achievers (15 year-olds; PISA study results)	Reading	24.4%	21.3%	21.3%	20.0%	17.0 %	15%
	Mathematics	32.3%[06]	30.3%	24.0%[06]	22.2%	-	15%
	Science	24.0%[06]	25.3%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		18.2%	14.5% b	17.6%	14.4%	10 %	10%
Upper secondary attai nment (age 20-24)		79.2%	82.2%	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	26.5%[08]	-	37.2%[08]	+15 %	-
	Share of females	%	41.9%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		25.4%	26.5%	22.4%	32.3%	-	40 %
Adult participation in lifelong learning (age 25-64; 4 weeks period)		2.6%[03]	3.3%	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		3.39%	4.04%[05]	4.88%	4.96%[07]	-	-

HUNGARY

		Hungary		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		93.9%	95.1%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	22.7%	17.6%	21.3%	20.0%	17.0 %	15%
	Mathematics	21.2%[06]	22.3%	24.0%[06]	22.2%	-	15%
	Science	15.0%[06]	14.1%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		13.9%	11.2% b	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		83.5%	84.0% b	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	18.9%[08]	-	37.2%[08]	+15 %	-
	Share of females	22.6%	25.7%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		14.8%	23.9%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		4.5 %[03]	2.7 %	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		4.42%	5.20%[07]	4.88%	4.96%[07]	-	-

IRELAND

		Ireland		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		75.0%	72.0%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	11.0%	17.2%	21.3%	20.0%	17.0 %	15%
	Mathematics	16.4%[06]	20.8%	24.0%[06]	22.2%	-	15%
	Science	15.5%[06]	15.2%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		14.6%[02]	11.3% b	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		82.6%	87.0%	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	1.0%[08]	-	37.2%[08]	+15 %	-
	Share of females	37.9%	30.4%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		27.5%	49.0%	22.4%	32.3%	-	40%
Adult par ticipation in lifelong learning (age 25-64; 4 weeks period)		5.9%[03]	6.3%	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		4.28%	4.90%[07]	4.88%	4.96%[07]	-	-

ITALY

		Italy		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		100%	98.8%[08]	85.6%	92.3%[08]		95%
Low achievers (15 year-olds; PISA study results)	Reading	18.9%	21.0%	21.3%	20.0%	17.0 %	15%
	Mathematics	32.8%[06]	24.9%	24.0%[06]	22.2%	-	15%
	Science	25.3%[06]	20.6%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		25.1%	19.2%	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		69.4%	76.3%	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	62.9%[08]	-	37.2%[08]	+15 %	-
	Share of females	36.6%	38.4%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		11.6%	19.0%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		6.3 %[04]	6.0 %	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		4.55%	4.29%[07]	4.88%	4.96%[07]	-	-

LATVIA

		Latvia		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		65.4%	88.9%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	30.1%	17.6%	21.3%	20.0%	17.0 %	15%
	Mathematics	20.7%[06]	22.6%	24.0%[06]	22.2%	-	15%
	Science	17.4%[06]	14.7%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		16.9%[02]	13.9%	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		76.5%	80.5% b	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	11.5%[08]	-	37.2%[08]	+15 %	-
	Share of females	31.4%	32.2%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		18.6%	30.1%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks pe riod)		7.8 %[03]	5.3 %	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		5.64%	5.00%[07]	4.88%	4.96%[06]	-	-

LITHUANIA

		Lithuania		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		60.6%	77.8%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	25.7%[06]	24.3%	21.3%	20.0%	17.0 %	15%
	Mathematics	23.0%[06]	26.2%	24.0%[06]	22.2%	-	15%
	Science	20.3%[06]	17.0%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		16.5%	8.7% b	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		78.9%	86.9% b	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	36.4%[08]	-	37.2%[08]	+15 %	-
	Share of females	35.9%	33.5%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attai nment (age 30-34)		42.6%	40.6%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		5.9%[04]	4.5 %	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		5.90%	4.67%[07]	4.88%	4.96%[07]	-	-

Source: Eurostat (UOE, LFS) and OECD (PISA)

[01]= 2001, [03]= 2003, [06] = 2006, [07] =2007, [08] =2008, e= estimate, b = break, p = provisional,
PISA: reading: 18 EU countries, maths and science: 25 EU countries
"EU Benchmarks" are defined as "EU average performance levels" (weighted averages)

LUXEMBOURG

		Luxembourg		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		94.7%	94.3%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	(35.1%)	26.0%	21.3%	20.0%	17.0 %	15%
	Mathematics	22.8%[06]	23.9%	24.0%[06]	22.2%	-	15%
	Science	22.1%[06]	23.7%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		16.8%	7.7% b	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		72.7%[03]	76.8% b	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	11.1%[08]	-	37.2%[08]	+15 %	-
	Share of females	-	48.2%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		21.2%	46.6% b	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		6.5 %[03]	13.4 % b	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		3.74%[01]	3.15%[07]	4.88%	4.96%[06]	-	-

MALTA

		Malta		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		100.0%	97.8%[08]	85.6%	92.3%[08]		95%
Low achievers (15 year-olds; PISA study results)	Reading	-	-	21.3%	20.0%	17.0 %	15%
	Mathematics	-	-	24.0%[06]	22.2%	-	15%
	Science	-	-	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		54.2%	36.8% b	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		40.9%	52.1% b	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	33.9%[08]	-	37.2%[08]	+15 %	-
	Share of females	26.3%	28.4%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		7.4%	21.1%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		4.3%[04]	5.8 %	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		4.49%	6.31[07]	4.88%	4.96%[06]	-	-

NETHERLANDS

		Netherlands		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		99.5%	99.5%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	(9.5%)	14.3%	21.3%	20.0%	17.0 %	15%
	Mathematics	11.5%[06]	13.4%	24.0%[06]	22.2%	-	15%
	Science	13.0%[06]	13.2%	20.3%[06]	17.7%	-	15%
Early leavers fr om education and training (age 18-24)		16.6%	10.9%b	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		71.9%	76.6%	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	39.3%[08]	-	37.2%[08]	+15 %	-
	Share of females	17.6%	18.9%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		26.5%	40.5%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		16.4 %[03]	17.0 %	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		4.96%	5.32%[07]	4.88%	4.96%[07]	-	-

POLAND

		Poland		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		58.3%	67.5%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	23.2%	15.0%	21.3%	20.0%	17.0 %	15%
	Mathematics	19.8%[06]	20.5%	24.0%[06]	22.2%	-	15%
	Science	17.0%[06]	13.2%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		7.4%[01]	5.3%	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		88.8%	91.3%	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	100.0%[08]	-	37.2%[08]	+15 %	-
	Share of females	35.9%	40.3%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		12.5%	32.8%	22.4%	32.3%	-	40%
Adult participation in lifelong le arning (age 25-64; 4 weeks period)		5.0 %[04]	4.7 %	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		4.89%	4.91%[07]	4.88%	4.96%[07]	-	-

PORTUGAL

		Portugal		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		78.9%	87.0%[08]	85.6%	92.3%[08]		95%
Low achievers (15 year-olds; PISA study results)	Reading	26.3%	17.6%	21.3%	20.0%	17.0 %	15%
	Mathematics	30.7[06]	23.7%	24.0%[06]	22.2%	-	15%
	Science	24.5[06]	16.5%	20.2%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		42.6%	31.2%	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		43.2%	55.5%	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	193.2%[08]	-	37.2%[08]	+15 %	-
	Share of females	41.9%	34.1%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		11.3%	21.1%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		4.3 %[04] p	6.5%	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		5.42%	5.30%[07]	4.88%	4.96%[07]	-	-

ROMANIA

		Romania		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		67.6%	82.8%[08]	85.6%	92.3%[08]		95%
Low achievers (15 year-olds; PISA study results)	Reading	41.3%	40.4%	21.3%	20.0%	17.0 %	15%
	Mathematics	52.7%[06]	47.0%	24.0%[06]	22.2%	-	15%
	Science	46.9%[06]	41.4%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		22.9%	16.6%	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		76.1%	78.3%	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	89.1%[08]	-	37.2%[08]	+15 %	-
	Share of females	35.1%	43.1%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		8.9%	16.8%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		1.4%[04]	1.5 %	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		2.86%	4.25%[07]	4.86%	4.96%[07]	-	-

SLOVAKIA

		Slovakia		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		76.1%	79.1%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	27.8%	22.3%	21.3%	20.0%	17.0 %	15%
	Mathematics	20.9[06]	21.0%	24.0%[06]	22.2%	-	15%
	Science	20.2[06]	19.3%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		6.7%[02]	4.9% b	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		94.8%	93.3%	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	185.8%[08]	-	37.2%[08]	+15 %	-
	Share of females	30.1%	36.8%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		10.6%	17.6%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		3.7%[03]	2.8 %	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		3.93%	3.62%[07]	4.88%	4.96%[06]	-	-

SLOVENIA

		Slovenia		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		85.2%	90.4%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	16.5[06]	16.5%[06]	21.3%	20.0%	17.0 %	15%
	Mathematics	17.7[06]	20.3%	24.0%[06]	22.2%	-	15%
	Science	13.9[06]	14.8%	20.3%[06]	17.7%	-	15%
Early leavers from educat ion and training (age 18-24)		6.4%[01]	5.3% u,p	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		88.0%	89.4%	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	16.0%[08]	-	37.2%[08]	+15 %	-
	Share of females	22.8%	26.5%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		18.5%	31.6%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		13.3 %[03]	14.6 %	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public s pending on education,% of GDP		5.89%[01]	5.19%[07]	4.88%	4.96%[07]	-	-

Source: Eurostat (UOE, LFS) and OECD (PISA)

[01]= 2001, [03]= 2003, [06] = 2006, [07] =2007, [08] =2008, e= estimate, b = break, p = provisional,
PISA: reading: 18 EU countries, maths and science: 25 EU countries
"EU Benchmarks" are defined as "EU average performance levels" (weighted averages)

SPAIN

		Spain		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		100.0%	99.0%[08]	85.6%	92.3%[08]		95%
Low achievers (15 year-olds; PISA study results)	Reading	16.3%	19.6%	21.3%	20.0%	17.0 %	15%
	Mathematics	24.7%[06]	23.7%	24.0%[06]	22.2%	-	15%
	Science	19.6%[06]	18.2%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		29.1%	31.2% b	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		66.0%	59.9%	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	14.8%[08]	-	37.2%[08]	+15 %	-
	Share of females	31.5%	30.2%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		29.2%	39.4%	22.4%	32.3%	-	40%
Adult participation in lifelong learn ing (age 25-64; 4 weeks period)		10.5 %[05]	10.4%	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		4.28%	4.35%[07]	4.88%	4.96%[07]	-	-

SWEDEN

		Sweden		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		83.6%	94.6%[08]	85.6%	92.3%[08]	-	95%
Low achiever s (15 year -olds; PISA study results)	Reading	12.6%	17.4%	21.3%	20.0%	17.0 %	15%
	Mathematics	18.3[06]	21.1%	24.0%[06]	22.2%	-	15%
	Science	16.4[06]	19.2%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		7.3%	10.7% b,p	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		85.2%, b	86.4% p	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	13.3%[08]	-	37.2%[08]	+15 %	-
	Share of females	32.1%	33.4%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher educatio n attainment (age 30-34)		31.8%	43.9%p	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		17.5%[01]	22.2% p	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		7.21%	6.69%[07]	4.88%	4.96%[07]	-	-

UNITED KINGDOM

		United Kingdom		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in ear ly childhood education (4 years old - year before start of comp. primary)		100%	97.3%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year -olds; PISA study results)	Reading	19.0[06]	18.4%	21.3%	20.0%	17.0 %	15%
	Mathematics	19.8[06]	20.2%	24.0%[06]	22.2%	-	15%
	Science	16.7[06]	15.0%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		18.2%	15.7% b	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		76.7%	79.3%	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	17.8%[08]	-	37.2%[08]	+15 %	-
	Share of females	32.1%	31.2%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		29.0%	41.5%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		20.0%[07]	20.1 %	8.5%[03]	9.3% p	12.5 %	15%
Investment in education Public spending on education,% of GDP		4.46%	5.39%[07]	4.88%	4.96%[07]	-	-

• *Candidates countries*

CROATIA

		Croatia		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		45.9%[03]	68.0%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	-	22.5%	21.3%	20.0%	17.0 %	15%
	Mathematics	-	33.2%	24.0%[06]	22.2%	-	15%
	Science	-	18.5%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		8.0%[02]	3.9% u	17.6%	14.4%	10 %	10%
Upper secondar y attainment (age 20-24)		90.6%[02]	95.1%	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	81.7%[08]	-	37.2%[08]	+15 %	-
	Share of females	-	33.2%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		16.1%	20.5% u	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		1.8%[03]	2.3 %	8.5%[03]	9.3%	12.5 %	15%
Investment in education Public spending on education,% of GDP		3.72%[02]	4.07%[07]	4.88%	4.96%[07]	-	-

ICELAND

		Iceland		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		57.8%	96.2%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year -olds; PISA study results)	Reading	14.5%	16.8%	21.3%	20.0%	17.0 %	15%
	Mathematics	-	17.0%	24.0%[06]	22.2%	-	15%
	Science	-	17.9%	20.3%[06]	17.7%	-	15%
Early leavers from ed ucation and training (age 18-24)		29.8%	21.4%	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		46.1%	53.6%	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	39.9%[08]	-	37.2%[08]	+15 %	-
	Share of females	37.9%	34.2%[07]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		31.0%	41.8%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		29.5%[03]	25.1%	8.5%[03]	9.3%	12.5 %	15%
Investment in education Public spe nding on education,% of GDP		5.93%	7.36%[07]	4.88%	4.96%[07]	-	-

The former Yugoslav Republic of Macedonia

		MK		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		17.4%	28.5%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year -olds; PISA study results)	Reading	60.0%	-	21.3%	20.0%	17.0 %	15%
	Mathematics	-	-	24.0%[06]	22.2%	-	15%
	Science	-	-	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		22.8%[06]	16.2%	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		.	81.9	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	68.0%[08]	-	37.2%[08]	+15 %	-
	Share of females	41.6%	42.8%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		-	14.3%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		2.3[06]	3.3%	8.5%[03]	9.3%	12.5 %	15%
Investment in education Public spending on education,% of GDP		3.35%[02]	3.39%[03]	4.88%	4.96%[07]	-	-

TURKEY

		Turkey		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of comp. primary)		11.6%	34.4%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study results)	Reading	-	24.5%	21.3%	20.0%	17.0%	15%
	Mathematics	-	42.1%	24.0%[06]	22.2%	-	15%
	Science	-	30.0%	20.3%[06]	17.7%	-	15%
Early leavers from education and training (age 18-24)		58.8%	44.3%	17.6%	14.4%	10%	10%
Upper secondary attainment (age 20-24)		38.6%	50.0%	76.6%	78.6%	85%	-
MST graduates (tertiary education)	Increase since 2000	-	70.8%[08]	-	37.2%[08]	+15%	-
	Share of females	31.1%	30.6%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		-	14.7%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		1.2%[03]	2.3%	8.5%[03]	9.3% p	12.5%	15%
Investment in education % of GDP		3.48%	2.86%[06]	4.88%	4.96%[07]	-	-

Source: Eurostat (UOE, LFS) and OECD (PISA)

[01]= 2001, [03]= 2003, [06] = 2006, [07] =2007, [08] =2008, e= estimate, b = break, p = provisional,
PISA: reading: 18 EU countries, maths and science: 25 EU countries
"EU Benchmarks" are defined as "EU average performance levels" (weighted averages)

• *EFTA country: Norway*

NORWAY		Norway		EU average		EU Benchmarks	
		2000	2009	2000	2009	2010	2020
Participation in early childhood education (4 years old - year before start of com p. primary)		49.3%	95.6%[08]	85.6%	92.3%[08]	-	95%
Low achievers (15 year-olds; PISA study res ults)	Reading	17.5%	14.9%	21.3%	20.0%	17.0 %	15%
	Mathematics	-	18.2%	24.0%[06]	22.2%	-	15%
	Science	-	15.8%	20.3%[06]	17.7%	-	15%
Early leavers from education and tr aining (age 18-24)		13.3%	17.6%	17.6%	14.4%	10 %	10%
Upper secondary attainment (age 20-24)		95.0%	69.7% b	76.6%	78.6%	85 %	-
MST graduates (higher education)	Increase since 2000	-	11.0%[08]	-	37.2%[08]	+15 %	-
	Share of females	26.8%	29.6%[08]	30.7%	32.6%[08]	Improve gender balance	-
Higher education attainment (age 30-34)		37.7%	47.0%	22.4%	32.3%	-	40%
Adult participation in lifelong learning (age 25-64; 4 weeks period)		17.1%[03]	18.1%	8.5%[03]	9.3%	12.5 %	15%
Investment in education Public spending on e ducation,% of GDP		5.42%[01]	6.76%[07]	4.88%	4.96%[07]	-	-

ANNEX 6

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