

## Task Force 2

### Knowledge-based Economy and Human Capital<sup>1</sup>

*September 2007*

In March 2000, The Heads of State and Government of the European Union (EU) endorsed the Lisbon Strategy (European Council during the Portuguese Presidency of the EU), with the ambitious goal of making Europe the most competitive knowledge-based economy in the world by 2010. An EU-level Strategy would have been more effective if all Member States acted in concert. Therefore the Strategy was shaped as a comprehensive and interdependent set of reforms and policies covering a number of areas - *e.g.* internal market, research and development, education, public services regulation, macroeconomic stability - to strengthen the competitiveness of the EU. For the Strategy it was decided to proceed through a combination of the traditional “Community method” of EU legislation, brought forward by the European Commission, and via a new process named “open method of coordination”. The latter applies in areas where the EU has no exclusive competence, thus still in the sovereignty of Member States (*e.g.* education and labour market policies). Under this process, Member States agreed to voluntarily cooperate and to make use of best practice from others, which could be customised to suit their particular national circumstances.

In the open method of coordination the Commission had to work as a “benchmarking centre”, ensuring that Member States have information about each other’s progress and policies; this method, applied on an annual basis, would have created the necessary peer pressure to achieve these goals by publicising the results achieved by the individual Member States. However benchmarking, with neither clear sanction nor incentive for Member States, resulted in a very weak form of coordination<sup>2</sup>.

#### **The EU as a knowledge-based economy**

The competitiveness of the EU in a globalised economy has not many alternatives apart from modernising social protection systems and making the labour market more flexible. However the “social” side of the Social Market Economy model - implicit in the Treaty of the European Community - cannot rely on cheap labour, but on the quality of human capital. Europe’s future economic development would depend on its ability to create and grow high value, innovative and research-based sectors capable of competing with the best in the world.

Knowledge in economic life is critical for productivity (one of the key driver for competitiveness) and it also reflects the realization that advancing educational attainment which makes an important contribution to social cohesion. A government eager to force the pace of economic advance may be tempted by savings

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<sup>2</sup> For an assessment of the Lisbon Strategy governance, please see "The Lisbon strategy for growth and employment" Report from the High Level Group chaired by Wim Kok (3 November 2004) and “Last exit to Lisbon” by Pisani-Ferry J. and A. Sapir, Bruegel Policy Brief n. 2/2006.

drives, tax cuts, investment subsidies or even population controls. As a result of these measures, each member of the labour force may enjoy more capital to work with. But this process of “capital-deepening”, as economists call it, eventually runs into diminishing returns. Giving a worker a second computer does not double his output.

Accumulation alone cannot yield lasting progress, and Solow<sup>3</sup> labelled “technological progress” as something that allows the economy to add to its output without necessarily adding more labour and capital. But in neither paper did he explain where it came from or how it could be accelerated: inventions and innovation were all exogenous. Romer<sup>4</sup> tried to make technology “endogenous” according to a three-point turn:

- 1) Ideas, unlike things, are “non-rival”: everyone can make use of a single design, recipe or blueprint at the same time.
- 2) The fabrication of ideas enjoys increasing returns to scale. Expensive to produce, they are cheap, almost costless, to reproduce.
- 3) The total cost of a design does not change much, whether it is used by one person or by a million.

Blessed with increasing returns, the manufacture of ideas might seem like a good business to go into. Actually, the opposite is true. If the business is free to enter, it is not worth doing so, because competition pares the price of a design down to the negligible cost of reproducing it. Unless idea factories can enjoy some measure of monopoly over their designs - by patenting them, copyrighting them, or just keeping them secret - they will not be able to cover the fixed cost of inventing them<sup>5</sup>. If in the Solow's model, technology falls like “manna from heaven”, Romer's theory, by contrast, calls for a more worldly response:

- Educate people,
- Subsidise their research,
- Import ideas from abroad,
- Carefully gauge the protection offered to intellectual property.

## Measuring knowledge

Since “knowledge-related variables” are mainly controlled at national level, the Community method could not apply and benchmarking - now softened after the introduction of the National Reform Programmes (NRPs) - made use of indicators to measure the achievements for each Member State (MS). Notwithstanding the renewed commitment written down in the 2005 mid-term review of the Lisbon Strategy (now “Growth and Jobs”), it seems that 2010 objectives are still far away. But as far as knowledge-based economy is concerned, is there a clear model that the EU has adopted? The Economist<sup>6</sup> recognises that it has been frustratingly hard to measure which MS is fostering knowledge best. Instead, there have been partial indicators mixing education with R&D and Innovation.

An attempt was made in 2006 by two think-tanks, the Lisbon Council and the Deutschland Denken, coordinated by Peer Ederer of the Zeppelin University in Friedrichshafen<sup>7</sup>. Mr Ederer's scorecard has four

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<sup>3</sup> Robert Solow (1956), “A Contribution to the Theory of Economic Growth”. Quarterly Journal of Economics 70: 65-94.

<sup>4</sup> Paul Michael Romer (1990), “Endogenous Technological Change”. Journal of Political Economy 98/5: 71-102.

<sup>5</sup> The Economist, “The growth of growth theory”. Print edition May 20th 2006

<sup>6</sup> The Economist, “The brain business”. Print edition October 12th 2006

<sup>7</sup> Ederer P. (2006), “Innovation at Work: The European Human Capital Index”. The Lisbon Council Policy Brief

columns. First comes a country's knowledge base or, as economists call it, “**human-capital endowment**”. This is the imputed value of all the effort that has gone into educating and training everyone in the country. This column also includes adult education and in-house training by companies. It turns out that these have at least as big an impact on a country's ability to create knowledge as the relative performance of its education system does. The resulting score for human-capital endowment is then depreciated, for what is called, with delightfully euphemistic tact, “obsolescence in the knowledge base and some level of forgetting”.

Next comes **employment**. It is no good training people and giving them splendid skills if they don't have a job, so the second measure is “human-capital utilisation”. That is a bit like a traditional employment rate but weighted for education, training and the rest of it. And as it is not much use training people and giving them jobs if they are working inefficiently, the study therefore includes a third measure, of **productivity**, to capture how well a country is using knowledge. It divides economic output by the human-capital stock (normal productivity measures, in contrast, divide output by the number of hours worked). Lastly, Mr Ederer included **demographic change**, since even if a country has well-trained people, with good jobs, working effectively, its knowledge base will still decline if low fertility means its working-age population is shrinking.

Sweden tops the European Human Capital Index in 2006, while Germany and the Mediterranean countries mark the bottom. The overall ranking is based on how each country scores in each of four individual human capital categories. Four is the best possible score; 52 is the worst (see Table 1):

**Table 1 - Ederer's European Human Capital Index**

<b>Rank</b>	<b>Country</b>	<b>Overall Score</b>
<b>1</b>	<b>Sweden</b>	<b>8</b>
2	Denmark	14
3	United Kingdom	19
4	Netherlands	21
5	Austria	23
6	Finland	29
7	Ireland	30
8	France	30
9	Belgium	31
10	Germany	36
11	Portugal	37
12	Spain	38
<b>13</b>	<b>Italy</b>	<b>48</b>

## Measuring knowledge: back to the basics

Compared to Ederer's analysis, in this paper we try to focus more on indicators which refer to **inputs** - Financial and Human Resources - and drivers which help to share the knowledge. Of course this model is physiologically incomplete, but it reduces the area of study avoiding other "markets" (e.g. employment) and "outputs" (e.g. OECD's PISA scores and Innovation). Moreover, for 4 out of the 10 Eurostat indicators chosen, we can capture even the difference between Females and Males (what we named "Gender Gap"):

<b>Financial Resources:</b>	Expenditure on education, Diversification of financial sources.
<b>Human Resources:</b>	Ratio of Students to Teachers, Early school-leavers (Total and Gender Gap), Youth education attainment level (Total and Gender Gap), Life-long learning (Total and Gender Gap), Science and technology graduates (Total and Gender Gap).
<b>Sharing the Knowledge:</b>	Students' mobility, Foreign languages studied, Internet and broadband penetration

For a sample of twelve Member States - Germany, France, United Kingdom, Italy, Spain, Poland, the Netherlands, Greece, Portugal, Belgium, Czech Republic, and Hungary – we measure the score for each of them by summing two variables:

- 1) Data for the last year available (*Last*);
- 2) The average annual percentage change from 2000 (the beginning of the Lisbon Strategy) to last year available (*Progress*).

MSs get a score according to the rank of their value in the data set, as a percentage of the data set. Therefore the best performer gets 1 while the worst performer gets 0. In Table 2 you can find rankings according to the Overall score, *i.e.* the sum of *Last* and *Progress* for the 14 indicators, where 28 is the maximum and 0 the minimum.

**Table 2 - Task Force's Final rankings**

Rank	Country	Overall score	Country	Last	Country	Progress
1	<b>Poland</b>	<b>16,899</b>	<b>Belgium</b>	<b>8,904</b>	<b>Poland</b>	<b>8,995</b>
2	Czech Republic	15,534	Czech Republic	8,176	Portugal	8,632
3	United Kingdom	15,081	United Kingdom	8,087	Netherlands	7,54
4	Belgium	15,079	Poland	7,904	Czech Republic	7,358
5	Netherlands	14,715	Netherlands	7,175	Greece	6,995
6	Portugal	13,901	France	7,085	United Kingdom	6,994
7	France	13,896	Germany	7,085	Italy	6,813
8	Greece	12,899	Hungary	6,448	France	6,811
9	Hungary	12,714	Greece	5,904	Hungary	6,266
10	Germany	12,533	Italy	5,446	Belgium	6,175
11	Italy	12,259	Portugal	5,269	Spain	5,63
12	<b>Spain</b>	<b>10,712</b>	<b>Spain</b>	<b>5,082</b>	<b>Germany</b>	<b>5,448</b>

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### 3. SHARING THE KNOWLEDGE

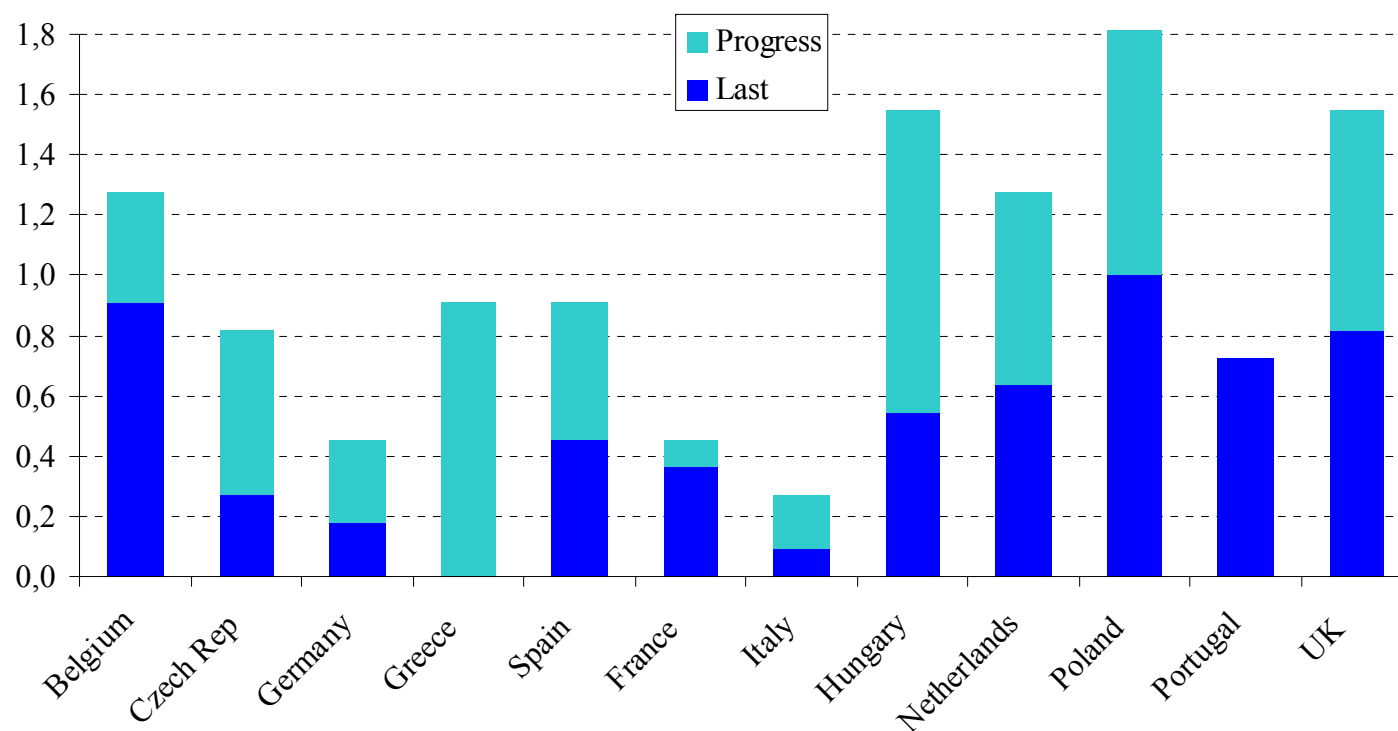
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## 1. FINANCIAL RESOURCES

### 1.1 Expenditure on education

For the total public expenditure on education, as % of total public expenditure (Table A2), we consider two variables: data for the last year available (*Last*), and the average annual percentage change from 2000<sup>8</sup> to 2004 (*Progress*).

Member States get a score according to the rank of their value in the data set, as a percentage of the data set. Therefore the best performer gets 1 while the worst performer gets 0. By adding up the scores for *Last* and *Progress* got by each MS we draw the following graph:

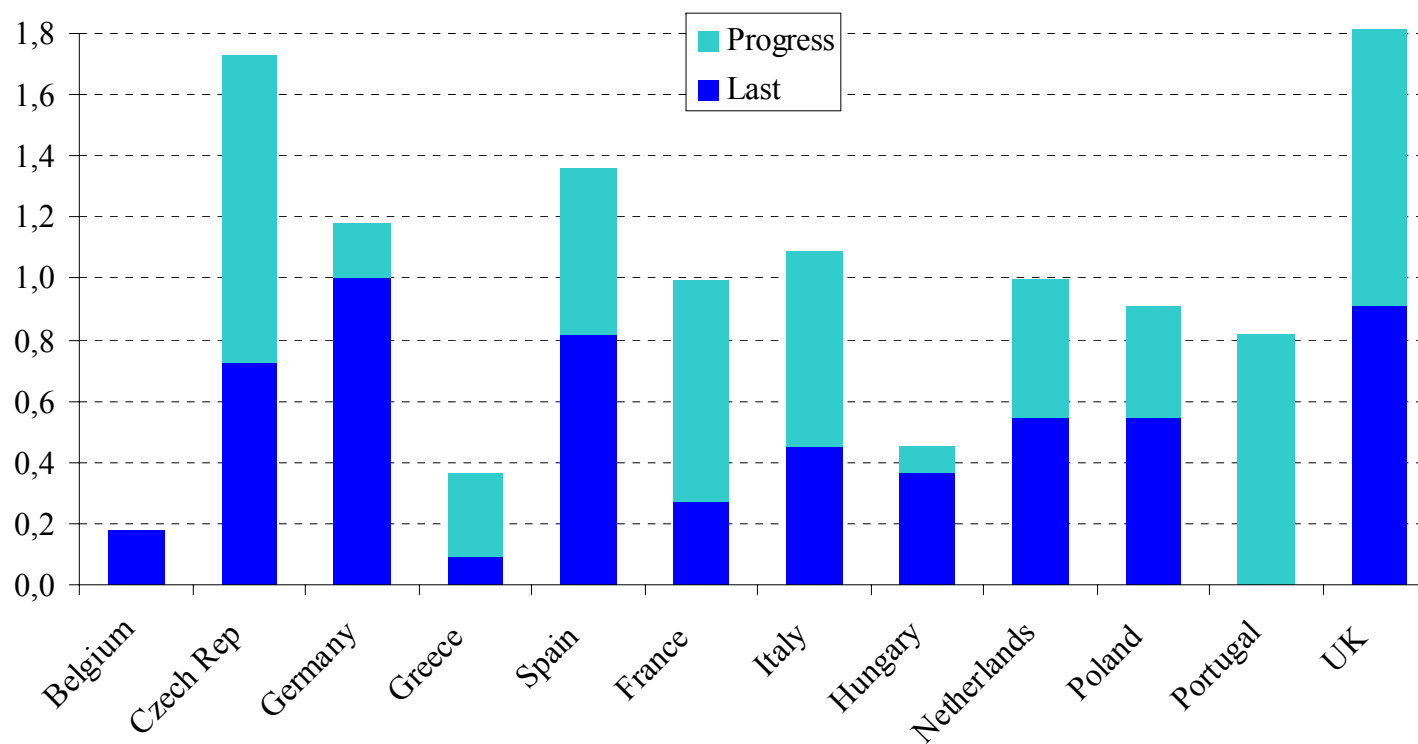


<sup>8</sup> 2001 for Belgium

## 1.2 Diversification of financial sources

For the difference between private and public sources of funds of educational institutions (Table A6), we consider two variables: data for the last year available (*Last*), and the average annual percentage change from 2000<sup>9</sup> to 2004 (*Progress*).

Member States get a score according to the rank of their value in the data set, as a percentage of the data set. Therefore the best performer gets 1 while the worst performer gets 0. By adding up the scores for *Last* and *Progress* got by each MS we draw the following graph:



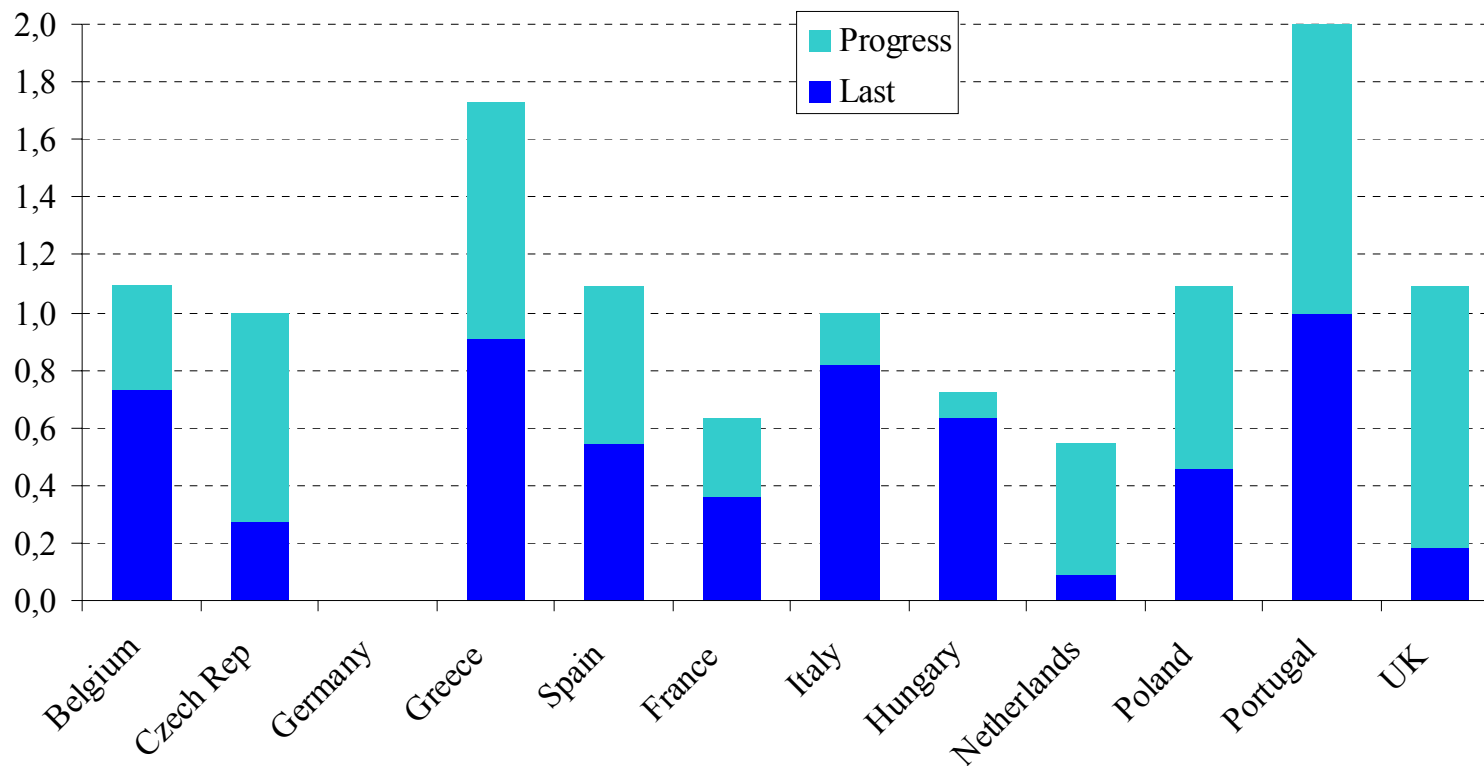
<sup>9</sup> 2001 for Belgium

## 2. HUMAN RESOURCES

### 2.1 Ratio of Students to Teachers

For the Ratio of Students to Teachers at ISCED 1-3 (Table A7), we consider two variables: data for the last year available (*Last*), and the average annual percentage change from 2000<sup>10</sup> to 2005 (*Progress*).

Member States get a score according to the rank of their value in the data set, as a percentage of the data set. Therefore the best performer gets 1 while the worst performer gets 0. By adding up the scores for *Last* and *Progress* got by each MS we draw the following graph:

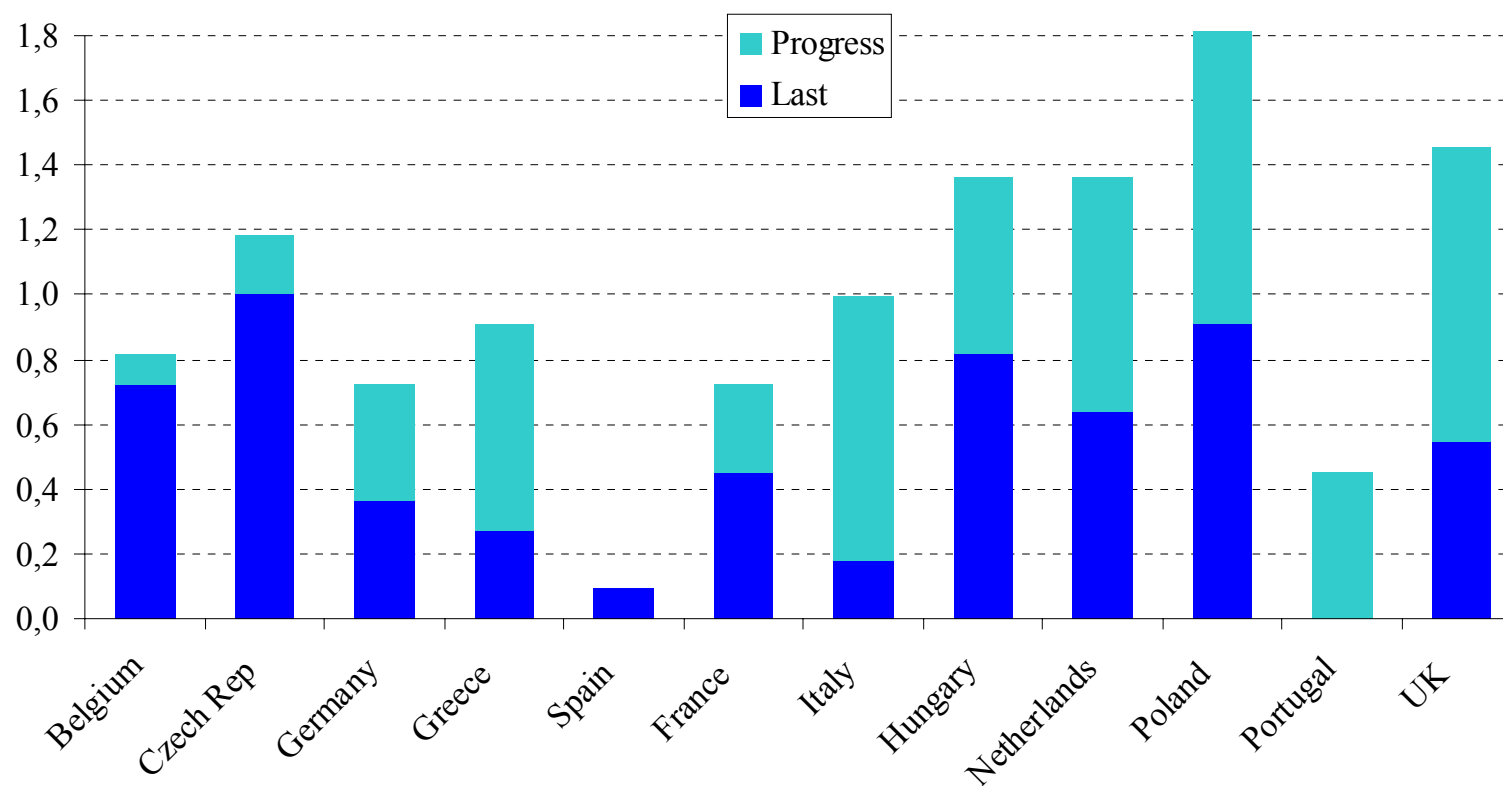


<sup>10</sup> 2001 for Belgium

## 2.2 Early school-leavers

For the percentage of the population aged 18-24 with at most lower secondary education and not in further education or training (Table A10), we consider two variables: data for the last year available (*Last*), and the average annual percentage change from 2000<sup>11</sup> to 2006 (*Progress*).

Member States get a score according to the rank of their value in the data set, as a percentage of the data set. Therefore the best performer gets 1 while the worst performer gets 0. By adding up the scores for *Last* and *Progress* got by each MS we draw the following graph:

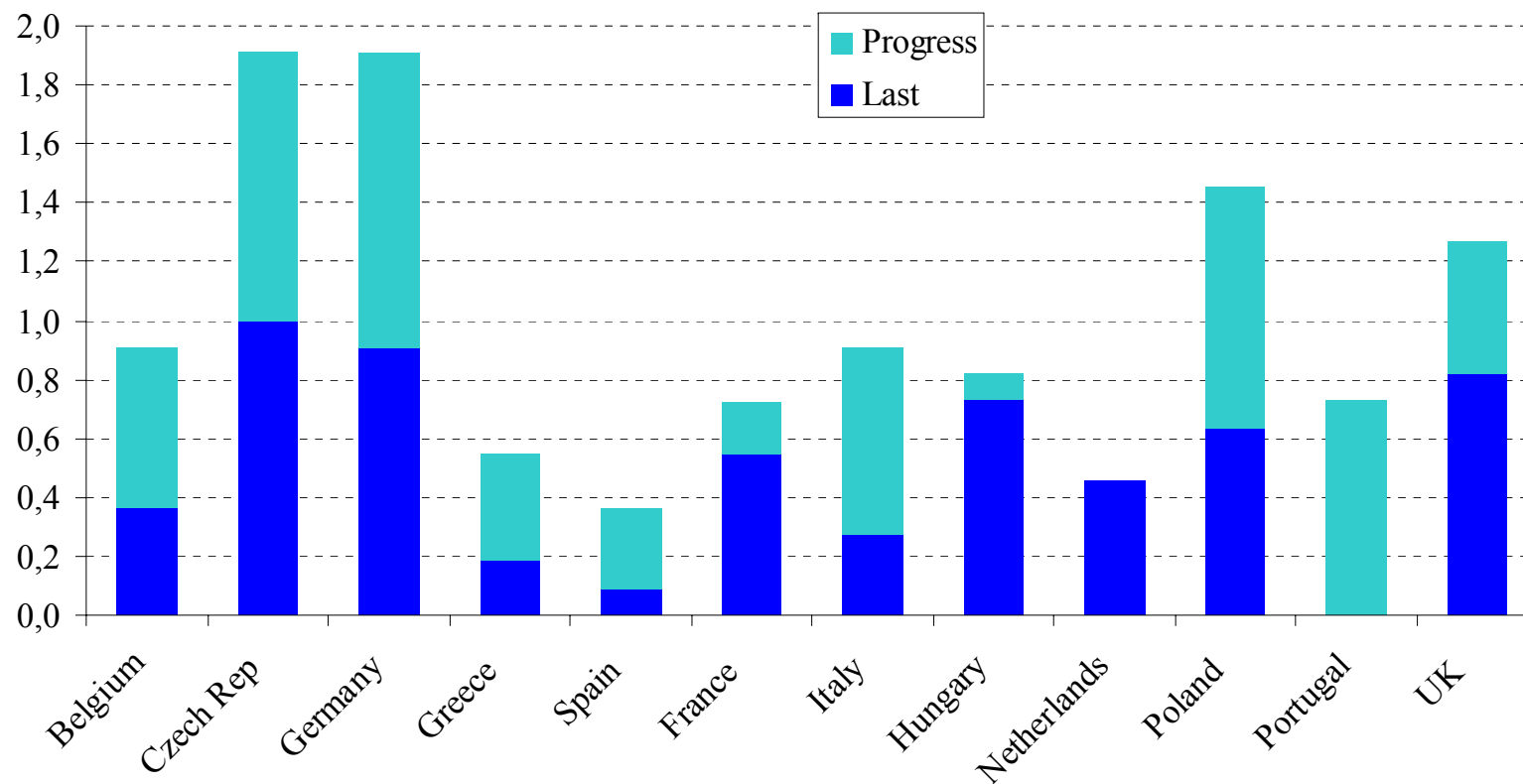


<sup>11</sup> 2002 for Czech Republic and 2001 for Poland

### 2.3 Early school-leavers: the gender gap

For the difference between Females and Males in the percentage of the population aged 18-24 with at most lower secondary education and not in further education or training (Table A11), we consider two variables: data for the last year available (*Last*), and the average annual percentage change from 2000<sup>12</sup> to 2006 (*Progress*).

Member States get a score according to the rank of their value in the data set, as a percentage of the data set. Therefore the best performer gets 1 while the worst performer gets 0. By adding up the scores for *Last* and *Progress* got by each MS we draw the following graph:

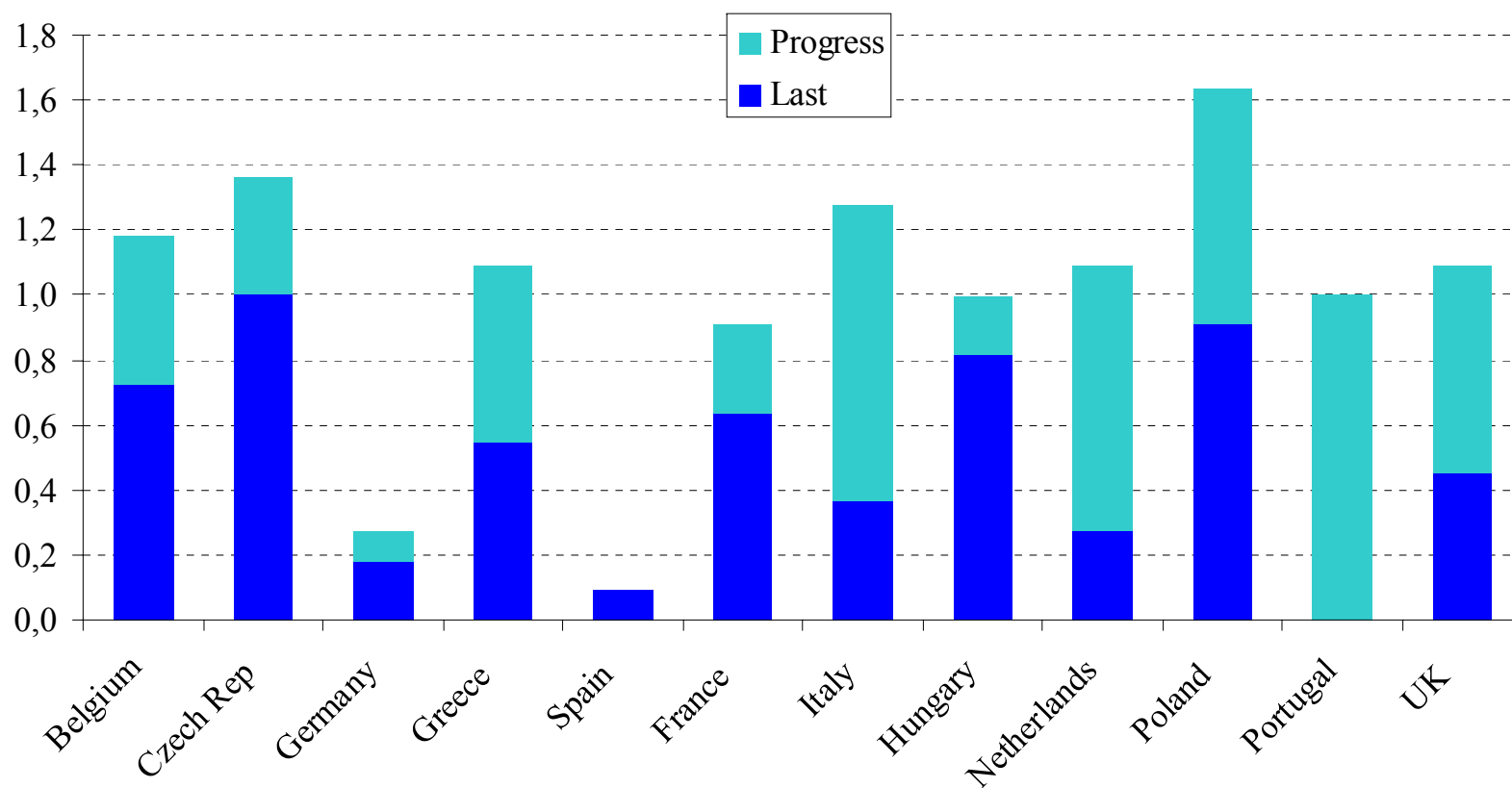


<sup>12</sup> 2002 for Czech Republic and 2001 for Poland

## 2.4 Youth education attainment level

For the percentage of the population aged 20 to 24 having completed at least upper secondary education (Table A12), we consider two variables: data for the last year available (*Last*), and the average annual percentage change from 2000 to 2006 (*Progress*).

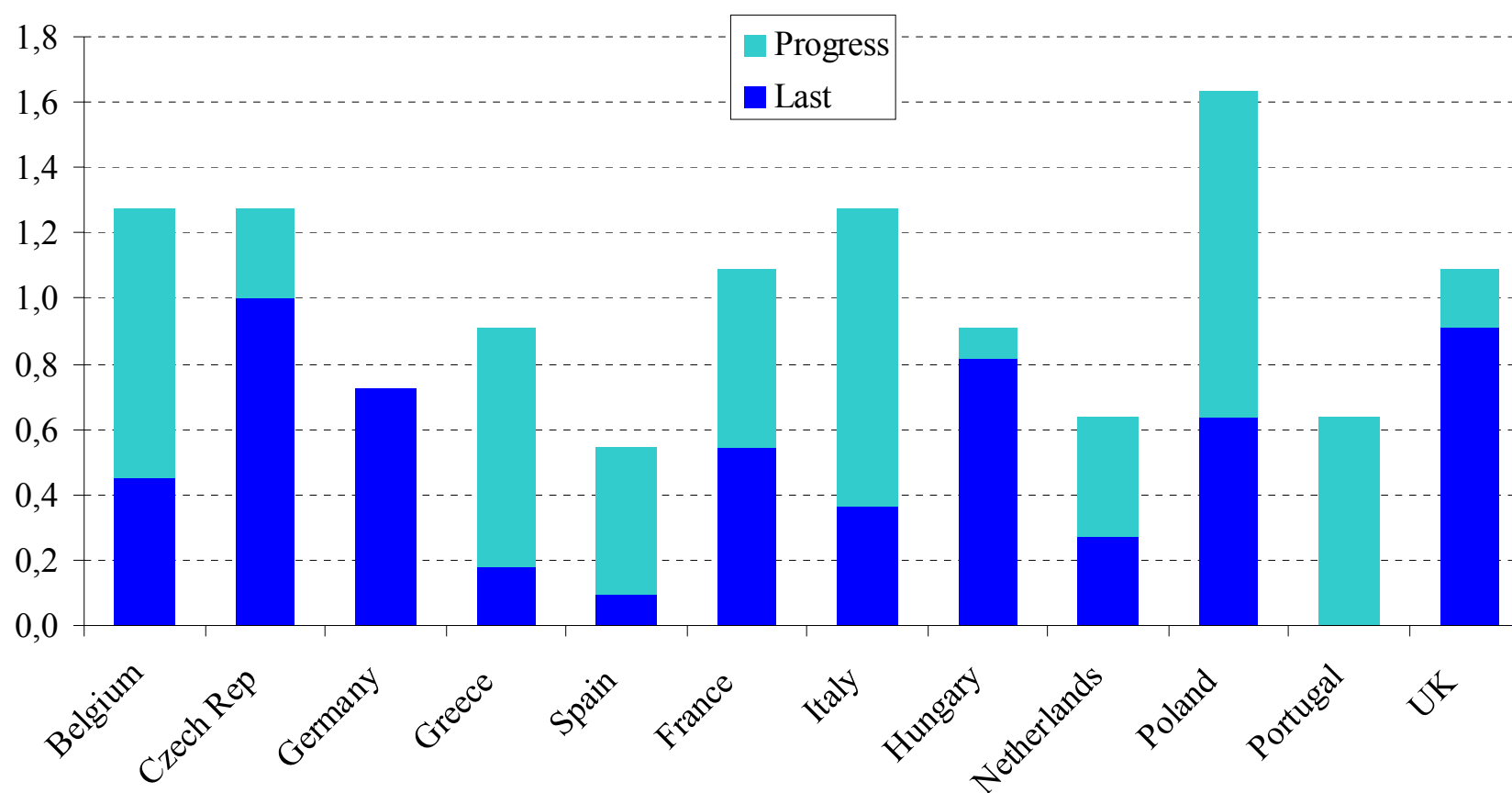
Member States get a score according to the rank of their value in the data set, as a percentage of the data set. Therefore the best performer gets 1 while the worst performer gets 0. By adding up the scores for *Last* and *Progress* got by each MS we draw the following graph:



## 2.5 Youth education attainment level: the gender gap

For the difference between Females and Males in the percentage of the population aged 20 to 24 having completed at least upper secondary education (Table A13), we consider two variables: data for the last year available (*Last*), and the average annual percentage change from 2000 to 2006 (*Progress*).

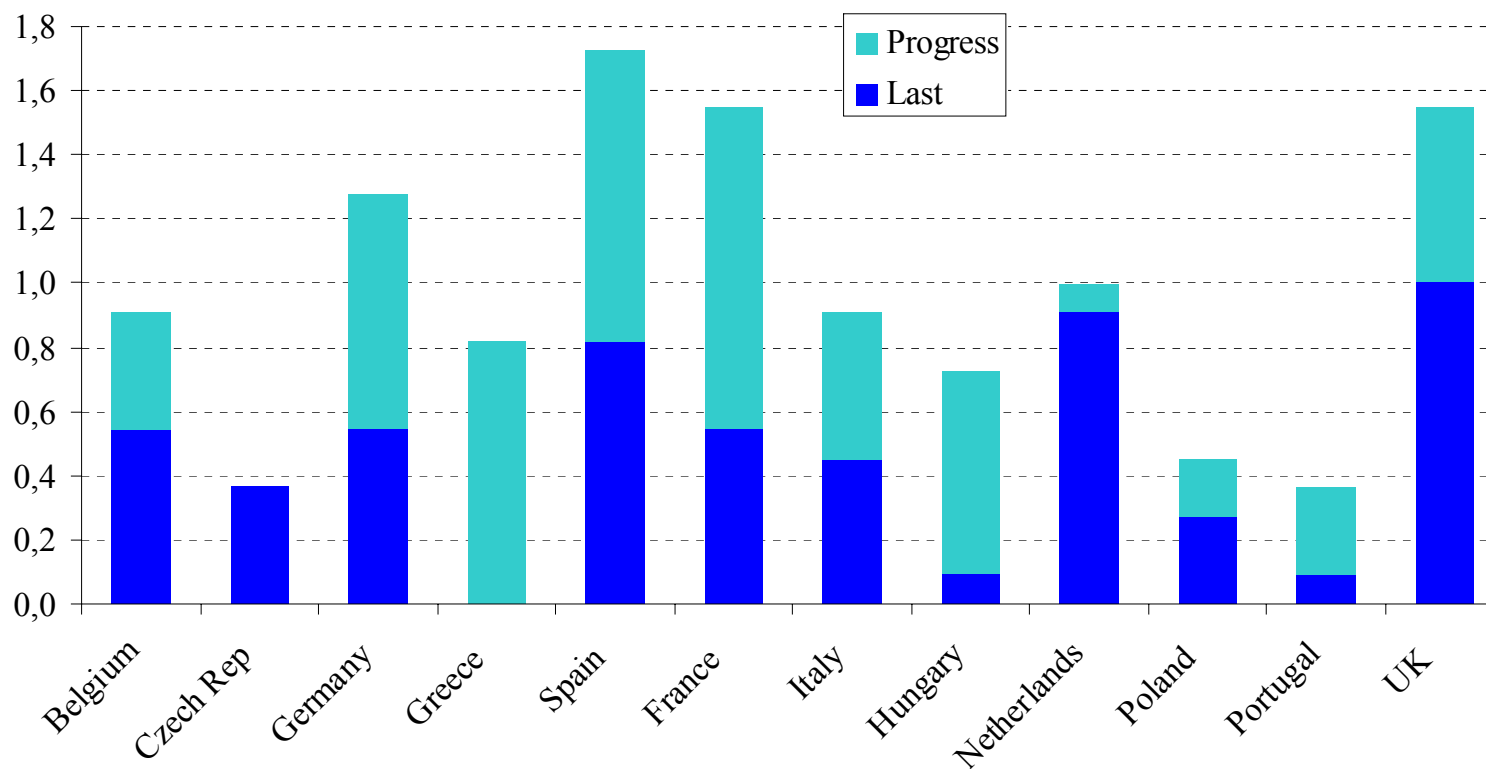
Member States get a score according to the rank of their value in the data set, as a percentage of the data set. Therefore the best performer gets 1 while the worst performer gets 0. By adding up the scores for *Last* and *Progress* got by each MS we draw the following graph:



## 2.6 Life-long learning

For the percentage of the population aged 25-64 participating in education and training over the four weeks prior to the survey (table A14), we consider two variables: data for the last year available (*Last*), and the average annual percentage change from 2000<sup>13</sup> to 2006 (*Progress*).

Member States get a score according to the rank of their value in the data set, as a percentage of the data set. Therefore the best performer gets 1 while the worst performer gets 0. By adding up the scores for *Last* and *Progress* got by each MS we draw the following graph:

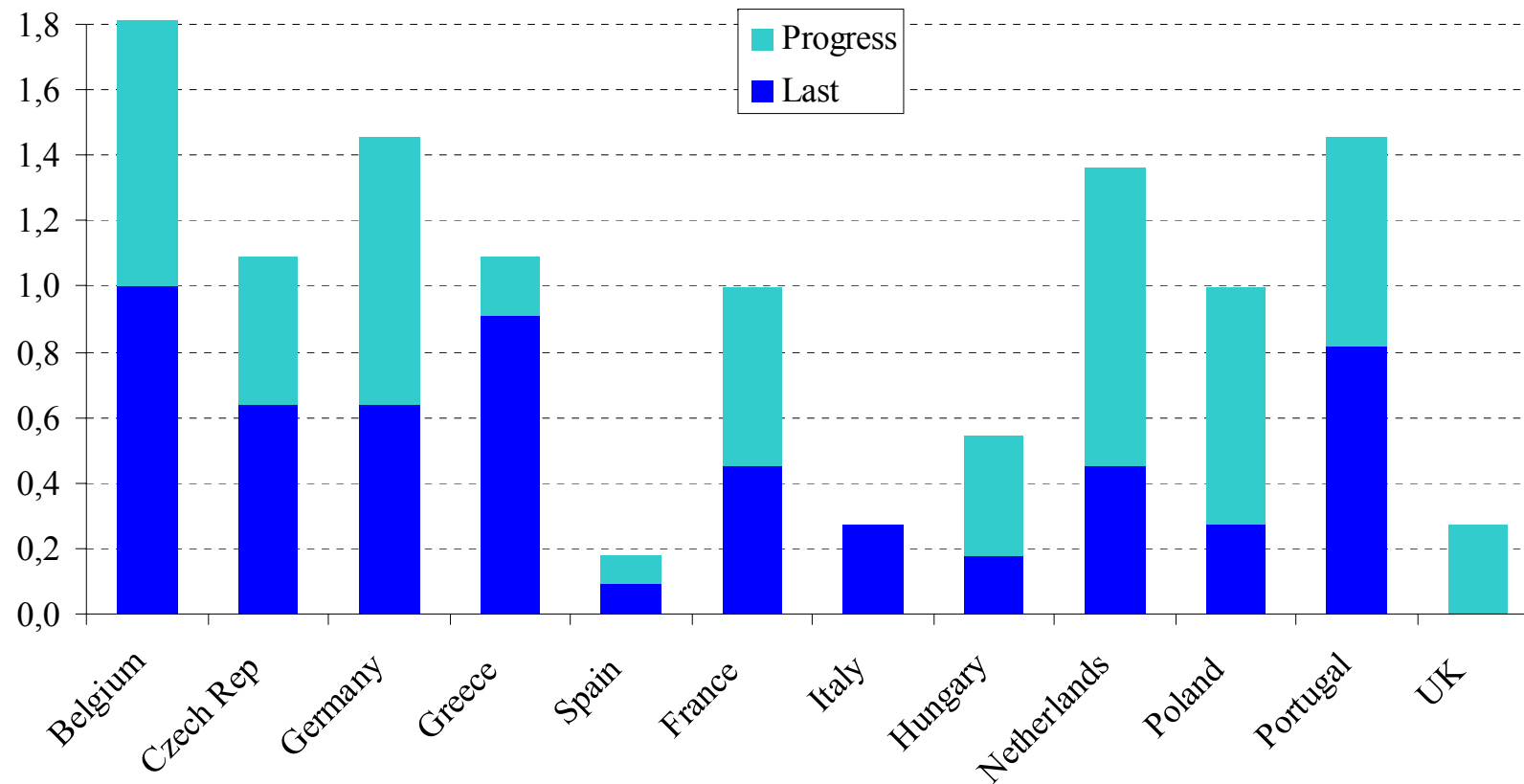


<sup>13</sup> 2002 for Czech Republic and 2001 for Poland

### 2.7 Life-long learning: the gender gap

For the difference between Females and Males in the percentage of the population aged 25-64 participating in education and training over the four weeks prior to the survey (table A15), we consider two variables: data for the last year available (*Last*), and the average annual percentage change from 2000 to 2006 (*Progress*).

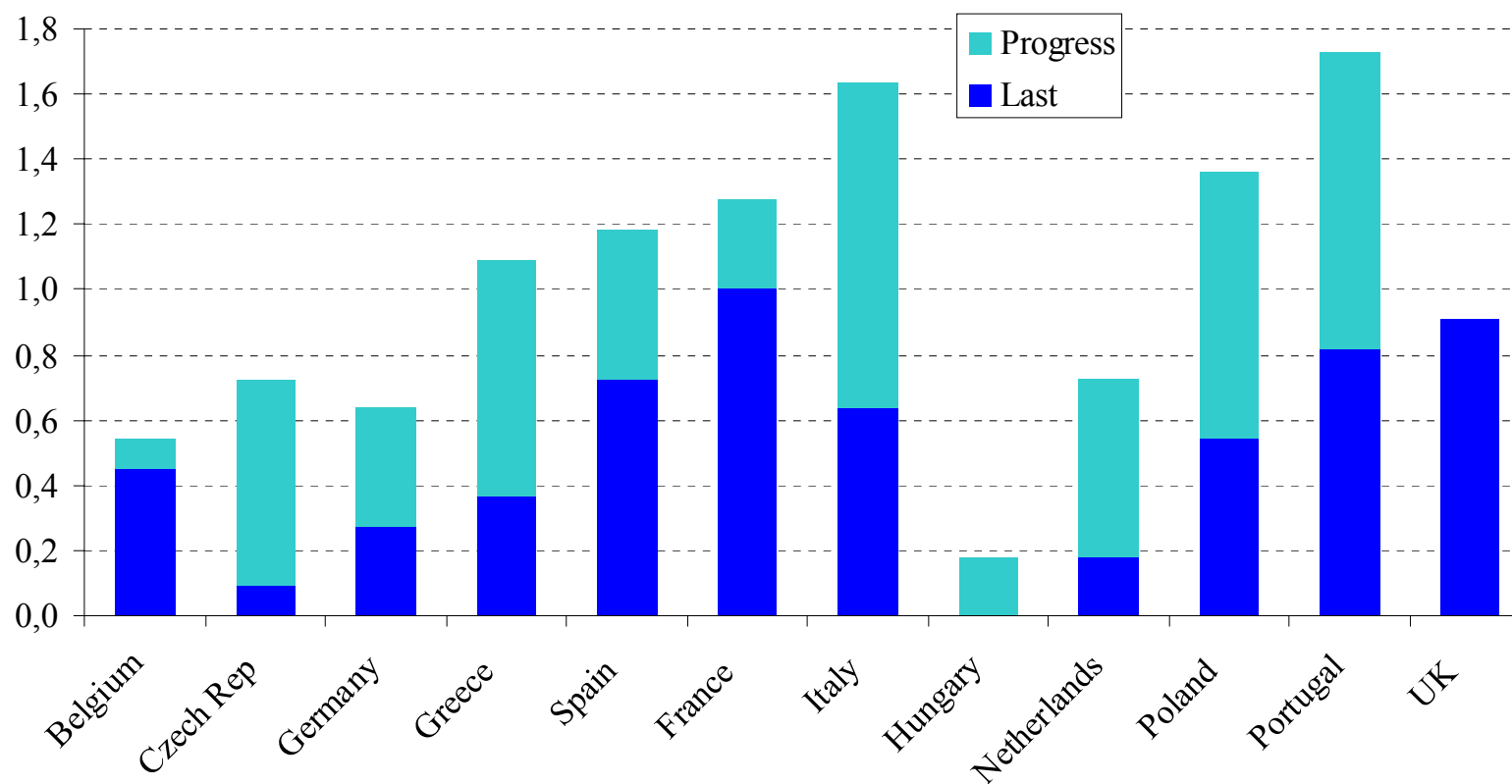
Member States get a score according to the rank of their value in the data set, as a percentage of the data set. Therefore the best performer gets 1 while the worst performer gets 0. By adding up the scores for *Last* and *Progress* got by each MS we draw the following graph:



## 2.8 Science and technology graduates

For the tertiary graduates in science and technology per 1000 of population aged 20-29 (Table A16), we consider two variables: data for the last year available (*Last*), and the average annual percentage change from 2000<sup>14</sup> to 2005 (*Progress*).

Member States get a score according to the rank of their value in the data set, as a percentage of the data set. Therefore the best performer gets 1 while the worst performer gets 0. By adding up the scores for *Last* and *Progress* got by each MS we draw the following graph:

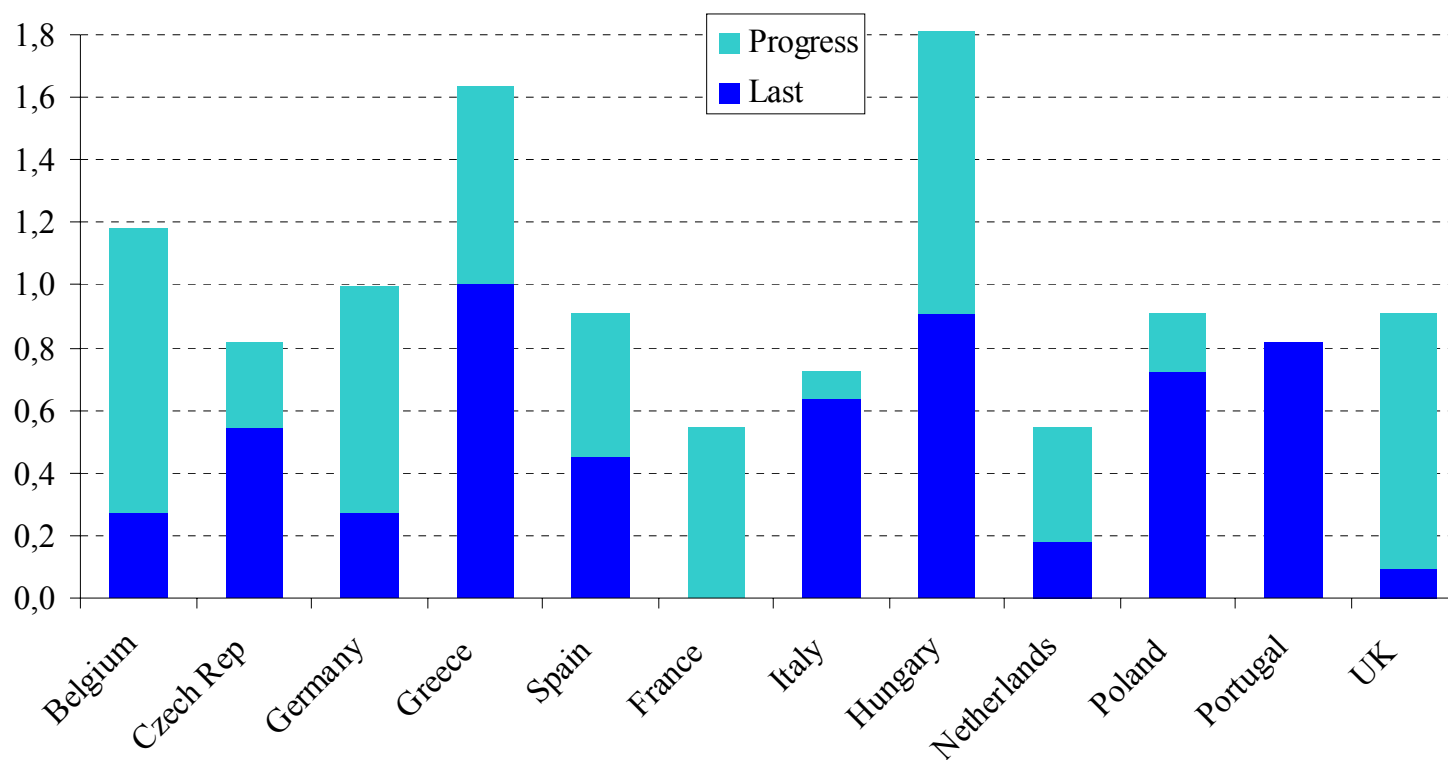


<sup>14</sup> 2004 for Greece

## 2.8 Science and technology graduates: the gender gap

For the difference between Females and Males in tertiary graduates in science and technology per 1000 of population aged 20-29 (Table A17), we consider two variables: data for the last year available (*Last*), and the average annual percentage change from 2000<sup>15</sup> to 2005 (*Progress*).

Member States get a score according to the rank of their value in the data set, as a percentage of the data set. Therefore the best performer gets 1 while the worst performer gets 0. By adding up the scores for *Last* and *Progress* got by each MS we draw the following graph:



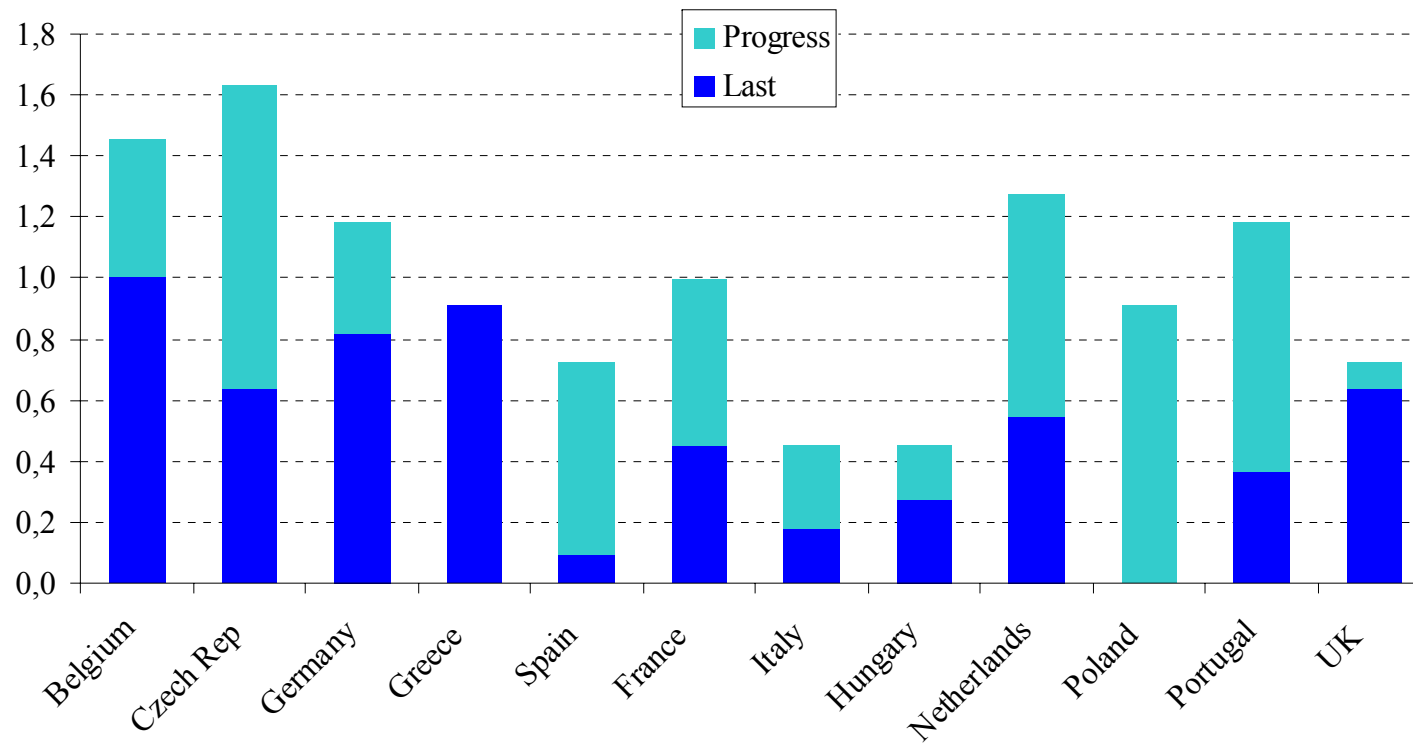
<sup>15</sup> 2004 for Greece

### 3. SHARING THE KNOWLEDGE

#### 3.1 Students' mobility

In order to measure “Students' mobility” we sum Students (ISCED 5-6) studying in another EU-27, EEA or Candidate country as % of all students (Table A18) to Inflow of students (ISCED 5-6) from EU-27, EEA and Candidate countries as % of all students in the country (Table A19). Then, we consider two variables: data for the last year available (*Last*), and the average annual percentage change from 2000<sup>16</sup> to 2005 (*Progress*).

Member States get a score according to the rank of their value in the data set, as a percentage of the data set. Therefore the best performer gets 1 while the worst performer gets 0. By adding up the scores for *Last* and *Progress* got by each MS we draw the following graph:

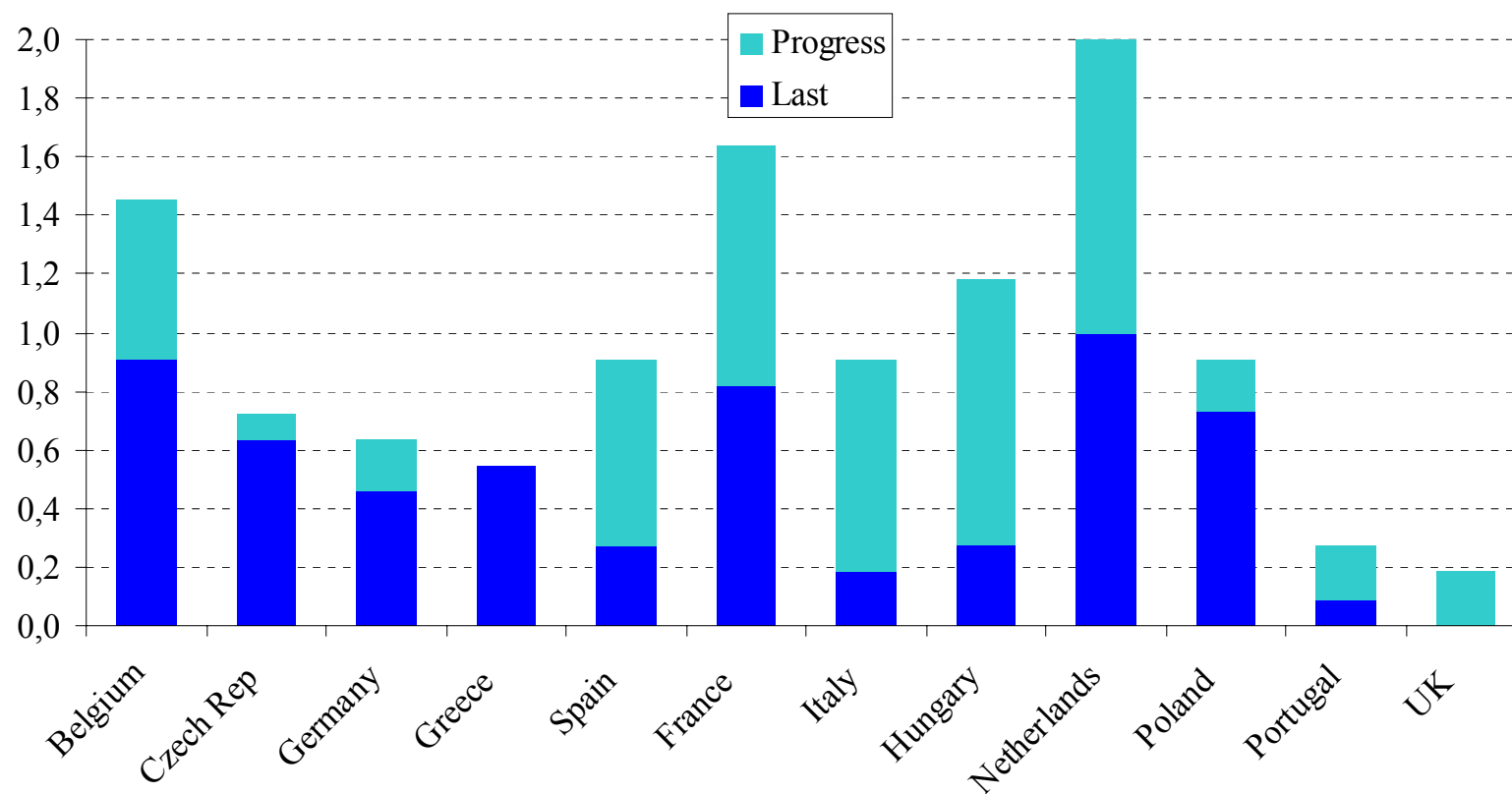


<sup>16</sup> 2002 for Greece and 2001 for Hungary

### 3.2 Foreign languages studied

In order to measure “Foreign languages studied” we calculate the average between the Average number of foreign languages learned per pupil at ISCED 2 (Table A20) and at ISCED 3 (Table A21). Then, we consider two variables: data for the last year available (*Last*), and the average annual percentage change from 2000<sup>17</sup> to 2005<sup>18</sup> (*Progress*).

Member States get a score according to the rank of their value in the data set, as a percentage of the data set. Therefore the best performer gets 1 while the worst performer gets 0. By adding up the scores for *Last* and *Progress* got by each MS we draw the following graph:



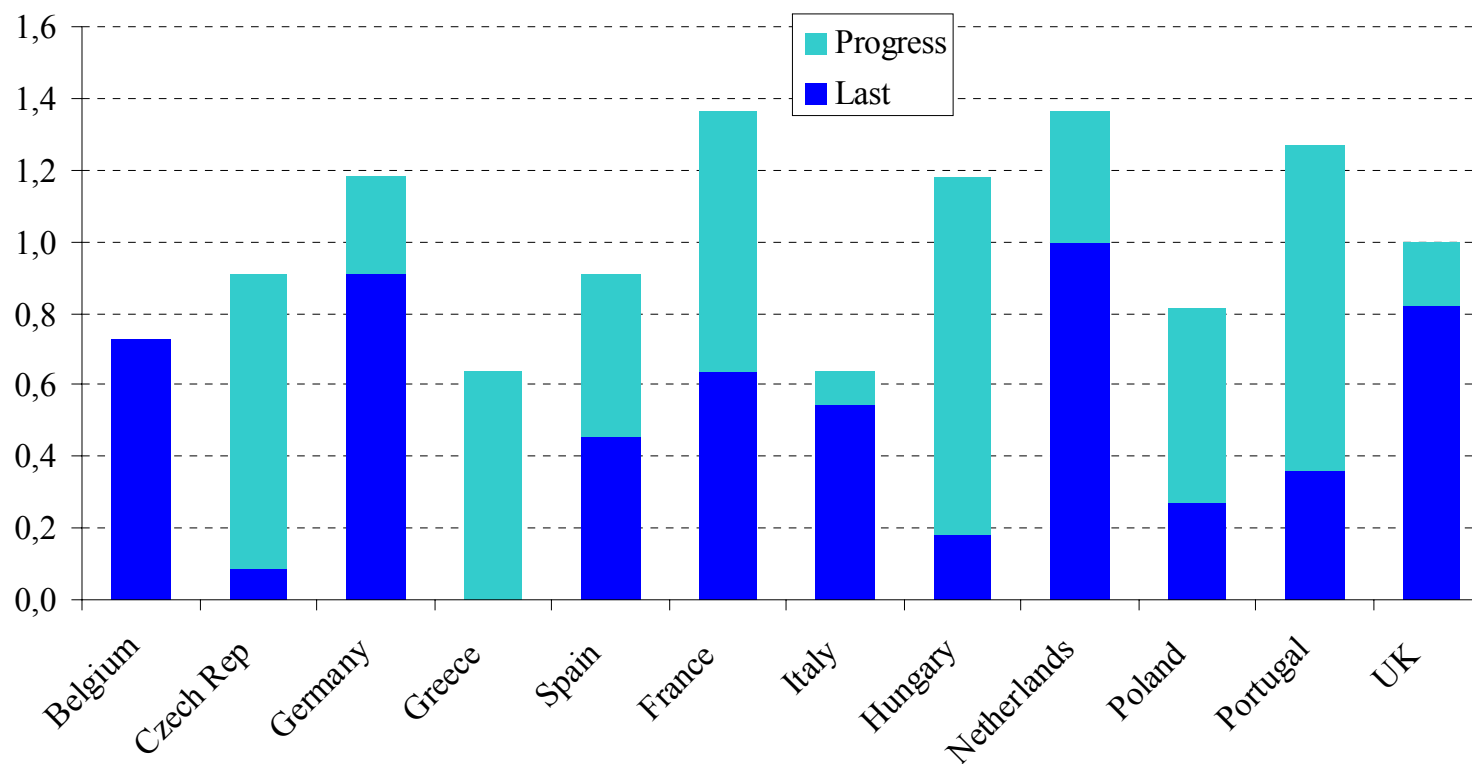
<sup>17</sup> 2001 for Greece and Netherland, 2004 for UK

<sup>18</sup> 2004 for France

### 3.3 Internet and broadband penetration

In order to measure Internet and broadband penetration we sum Students Percentage of households who have Internet access at home (Table A21) to Number of broadband lines subscribed in percentage of the population (Table A22). Then, we consider two variables: data for the last year available (*Last*), and the average annual percentage change from 2002<sup>19</sup> to 2006 (*Progress*).

Member States get a score according to the rank of their value in the data set, as a percentage of the data set. Therefore the best performer gets 1 while the worst performer gets 0. By adding up the scores for *Last* and *Progress* got by each MS we draw the following graph:



<sup>19</sup> 2005 for Belgium; 2004 for Czech Republic, Poland and Hungary; 2003 for Spain

## **ANNEX A - List of educational levels**

The International Standard Classification of Education (ISCED) was designed by UNESCO to serve “as an instrument suitable for assembling, compiling and presenting statistics of education both within individual countries and internationally”.

### **ISCED 0 Pre-primary level of education**

Initial stage of organised instruction, designed primarily to introduce very young children to a school-type environment. Programmes at this level are typically designed for children at least 3 years old and not older than 6.

### **ISCED 1 Primary level of education**

Programmes normally designed to give students a sound basic education in reading, writing and mathematics. Primary education usually begins at age 5, 6, or 7. Programmes at the primary level generally require no previous formal education, although it is becoming increasingly common for children to have attended a pre-primary programme before entering primary education.

### **ISCED 2 Lower secondary level of education**

The lower secondary level of education generally continues the basic programmes of the primary level, although teaching is typically more subject-focused, often employing more specialised teachers who conduct classes in their field of specialisation.

This level can range from 2 to 6 years of schooling (the mode of OECD countries is 3 years).

### **ISCED 3 Upper secondary level of education (3A, 3B, 3C)**

The final stage of secondary education in most countries. Instruction is often more organised along subject-matter lines than at ISCED level 2 and teachers typically need to have a higher level, or more subject-specific, qualification than at ISCED 2. There are substantial differences in the typical duration of ISCED 3 programmes both across and between countries, typically ranging from 2 to 5 years of schooling.

### **ISCED 4 Post-secondary, non-tertiary education (4A, 4B, 4C)**

These programmes straddle the boundary between upper secondary and post-secondary education from an international point of view, even though they might clearly be considered as upper secondary or post-secondary programmes in a national context. These programmes are often not significantly more advanced than programmes at ISCED 3 but they serve to broaden the knowledge of participants who have already completed a programme at level 3. The students are typically older than those in ISCED 3 programmes. They typically have a full-time equivalent duration of between 6 months and 2 years.

### **ISCED 5 First stage of tertiary education (5A, 5B)**

Programmes with an educational content more advanced than those offered at levels 3 and 4.

ISCED 5A Programmes that are largely theoretically based and are intended to provide sufficient qualifications for gaining entry into advanced research programmes and professions with high skills requirements. Duration categories: Medium: 3 to less than 5 years; Long: 5 to 6 years; Very long: More than 6 years.

### **ISCED 6 Second stage of tertiary education (leading to an advanced research qualification)**

This level is reserved for tertiary programmes that lead to the award of an advanced research qualification. The programmes are devoted to advanced study and original research.

## Annex B – “Human Capital” indicators

**Table A1 - Total public expenditure on education as % of GDP**

	2000	2001	2002	2003	2004
Belgium	:	6	6,11	6,06	5,99
Czech Republic	4,04	4,09	4,32	4,51	4,42
Germany	4,45	4,49	4,7	4,71	4,6
Greece	3,71	3,85	3,9	3,94	4,22
Spain	4,28	4,23	4,25	4,28	4,25
France	5,83	5,59	5,57	5,88	5,81
Italy	4,47	4,86	4,62	4,74	4,59
Hungary	4,5	5	5,36	5,85	5,43
Netherlands	4,86	4,78	4,86	5,12	5,18
Poland	4,87	5,43	5,42	5,62	5,41
Portugal	5,42	5,61	5,54	5,61	5,31
United Kingdom	4,64	4,68	5,23	5,38	5,29

*Source: Eurostat*

**Table A2 -Total public expenditure on education as % of total public expenditure**

	2000	2001	2002	2003	2004
Belgium	:	12,22	12,26	11,84	12,16
Czech Republic	9,59	9,2	9,34	9,53	9,95
Germany	9,88	9,43	9,77	9,71	9,77
Greece	7,28	7,72	7,93	8,02	8,48
Spain	10,98	11	10,98	11,19	10,97
France	11,42	10,84	10,58	11,01	10,92
Italy	9,73	10,12	9,75	9,82	9,6
Hungary	9,51	10,55	10,47	11,93	11,13
Netherlands	10,75	10,55	10,52	10,87	11,18
Poland	11,16	12,4	12,25	12,59	12,71
Portugal	12,61	12,62	12,51	12,24	11,38
United Kingdom	11,51	11,67	12,74	12,71	12,14

*Source: Eurostat*

**Table A3 - Annual expenditure on public and private educational institutions per pupil compared to GDP per capita**

	ISCED 1		ISCED 2-4		ISCED 5-6	
	2000	2004	2000	2004	2000	2004
Belgium	16,3	20,6	26,1	24,1	40,7	36,8
Czech Republic	12,2	14,3	21,3	24	35,5	34,7
Germany	16,1	16,5	26,8	24,2	41,7	40,3
Greece	15,6	17,3	19,9	23,9	24,8	25,5
Spain	19,5	19,1	25,6	25,8	32,9	36
France	17,1	17,5	29,1	30	31,9	36,8
Italy	24,5	25,3	30,7	27,6	31,3	27,8
Hungary	:	22,9	:	23,1	:	40,5
Netherlands	15,7	18,5	21,6	22,5	45,4	41,4
Poland	21,4	23,5	17,9	20,9	29,7	33,8
Portugal	21,9	22,3	31,7	29,7	28,4	28,9
United Kingdom	15,3	19,2	21	22,7	38	36,7

*Source: Eurostat (2000 figures Greece and Italy refer to 2001)*

**Table A4 - Financial aid to pupils and students as % of total public expenditure on education**

	ISCED 1-4		ISCED 5-6	
	2000	2004	2000	2004
Belgium	0,3	1,9	16,3	15,7
Czech Republic	5,7	4,7	8,6	5,8
Germany	4,1	4,9	14	17,9
Greece	0,2	0,3	5,8	5,2
Spain	1	1,5	8,5	7,8
France	3,5	3,4	8,1	7,9
Italy	0,7	1,6	18,3	16,7
Hungary	0,6	6,1	11,1	15,8
Netherlands	7,8	7	27	27
Poland	0,3	0,4	0,5	0,4
Portugal	1,4	1,4	6,7	5,4
United Kingdom	0,1	2	12,9	23,9

*Source: Eurostat***Table A5 - Expenditure on educational institutions from private sources as % of GDP**

	2000	2001	2002	2003	2004
Belgium	0,4	0,4	0,4	0,4	0,3
Czech Republic	0,4	0,4	0,2	0,4	0,6
Germany	1	1	0,9	0,9	0,9
Greece	0,2	0,2	0,2	0,2	0,2
Spain	0,6	0,6	0,5	0,5	0,6
France	0,5	0,5	0,5	0,6	0,5
Italy	0,4	0,3	0,4	0,4	0,5
Hungary	0,6	0,6	0,6	0,6	0,5
Netherlands	0,5	0,4	0,5	0,5	0,5
Poland	:	:	0,6	0,7	0,6
Portugal	0,1	0,1	0,1	0,1	0,1
United Kingdom	0,8	0,8	0,9	1	1

*Source: Eurostat***Table A6 - Expenditure of public and private sources of funds of educational institutions as % of expenditure on educational institutions**

	Public sources		Private sources	
	2000	2004	2000	2004
Belgium	92,1	94,3	7,9	5,7
Czech Republic	89,9	87,3	10,1	12,7
Germany	81,1	82,3	18,9	17,7
Greece	93,8	95,3	6,2	4,7
Spain	87,4	87,1	12,6	12,9
France	92,1	91,2	7,9	8,8
Italy	90,9	90,4	9,1	9,6
Hungary	88,3	90,7	11,7	9,3
Netherlands	90,3	90,1	9,7	9,9
Poland	89,2	90,1	10,8	9,9
Portugal	98,6	97,5	1,4	2,5
United Kingdom	85,2	83,9	14,8	16,1

*Source: Eurostat (2000 figures for Poland refer to 2002)*

**Table A7 - Ratio of Students to Teachers at ISCED 1-3**

	2000	2001	2002	2003	2004	2005
Belgium	:	11,2	10,7	11	10,8	10,8
Czech Republic	16,6	15,6	15,1	14,8	14,4	14,4
Germany	16,4	16,3	16,1	16	16,1	17,2
Greece	11,8	11,4	10,6	10	9,5	9,4
Spain	13,1	12,4	12,6	12,2	12,2	12,1
France	14,6	14,5	14,3	14,3	14,3	14,3
Italy	10,6	10,4	10,3	10,7	10,9	10,6
Hungary	10,6	11,6	11,4	11,3	11	11
Netherlands	17	17,2	16,5	15,9	15,9	16,1
Poland	13,8	13,9	13,4	12,5	:	12,3
Portugal	10,6	10,1	9,5	9,8	9,6	7
United Kingdom	19,6	19,3	20,1	19,6	16,7	14,5

Source: Eurostat

**Table A8 - Teachers/academic staff aged 50 in ISCED 5-6 as % of all teachers/academic staff in ISCED 5-6**

	2000	2001	2002	2003	2004	2005
Belgium	37,1	37,4	36,7	37,2	37,7	38,5
Czech Republic	29,8	:	:	:	:	:
Germany	30	30,4	30	29,9	29,5	29,2
Greece	:	:	:	:	52	32
Spain	26,6	27,4	28	27,9	28,6	29,6
France	42	37,3	41,3	34,5	39,2	38,9
Italy	59,2	58,8	57,5	56,2	57,7	57,5
Hungary	:	41,7	40,5	41,7	43,6	43,6
Netherlands	:	32,6	32,6	33,4	33,6	33,7
Poland	:	26,8	:	27,4	:	30,3
Portugal	:	:	:	25,8	23,9	24,5
United Kingdom	34,3	35,2	35,9	36,4	29,4	29,8

Source: Eurostat

**Table A9 - Women teachers/academic staff in ISCED 5-6 as % of all teachers/academic staff in ISCED 5-6**

	2000	2001	2002	2003	2004	2005
Belgium	37,4	38	38,8	39,3	39,9	40,7
Czech Republic	38,4	39,9	39,9	39,3	:	40,1
Germany	31	31,4	32,2	32,9	33,7	34,4
Greece	:	:	:	:	36,5	36
Spain	36	38	37,2	38,1	38,4	38,8
France	33	45,7	33,9	37,8	39,3	38
Italy	30	39,3	30,5	32,5	32,9	33,5
Hungary	38,5	36,7	40,1	39	38,6	38,8
Netherlands	:	31,6	33,1	33,8	34,3	35,2
Poland	:	1,7	:	1,3	:	41
Portugal	:	:	:	40,7	41,9	42
United Kingdom	33,1	33,9	35	36,2	38,5	39,9

Source: Eurostat

**Table A10 - Early school-leavers: 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
Belgium	12,5	13,6	12,4	12,8	11,9	13	12,6
Czech Republic	:	:	5,5	6	6,1	6,4	5,5
Germany	14,9	12,5	12,6	12,8	12,1	13,8	13,8
Greece	18,2	17,3	16,7	15,5	14,9	13,3	15,9
Spain	29,1	29,2	29,9	31,3	31,7	30,8	29,9
France	13,3	13,5	13,4	12,7	13,4	12,6	13,1
Italy	25,3	26,4	24,3	23,5	22,3	21,9	20,8
Hungary	13,8	12,9	12,2	11,8	12,6	12,3	12,4
Netherlands	15,5	15,3	15	14,2	14	13,6	12,9
Poland	:	7,9	7,6	6,3	5,7	5,5	5,6
Portugal	42,6	44	45,1	40,4	39,4	38,6	39,2
United Kingdom	18,4	17,7	17,8	16,8	14,9	14	13

Source: Eurostat

**Table A11 - Early school-leavers: Females and Males**

	Females		Males	
	2000	2006	2000	2006
Belgium	10,2	10,2	14,8	14,9
Czech Republic	5,7	5,4	5,3	5,7
Germany	15,2	13,6	14,6	13,9
Greece	13,6	11	22,9	20,7
Spain	23,4	23,8	34,7	35,8
France	11,9	11,2	14,8	15,1
Italy	21,9	17,3	28,8	24,3
Hungary	13,2	10,7	14,3	14
Netherlands	14,8	10,7	16,2	15,1
Poland	6	3,8	9,7	7,2
Portugal	35,1	31,8	50,1	46,4
United Kingdom	17,9	11,4	14,8	14,6

Source: Eurostat (2000 figures for Czech Republic and Poland refer respectively to 2002 and 2001)

**Table A12 - Youth education attainment level: Percentage of the population aged 20 to 24 having completed at least upper secondary education**

	2000	2001	2002	2003	2004	2005	2006
Belgium	81,7	81,7	81,6	81,2	81,8	81,8	82,4
Czech Republic	91,2	90,6	92,2	92,1	91,4	91,2	91,8
Germany	74,7	73,6	73,3	72,5	72,8	71,5	71,6
Greece	79,2	80,2	81,1	81,7	83	84,1	81
Spain	66	65	63,7	62,2	61,2	61,8	61,6
France	81,6	81,8	81,7	81,8	81,4	82,6	82,1
Italy	69,4	67,9	69,6	71	73,4	73,6	75,5
Hungary	83,5	84,7	85,9	84,7	83,5	83,4	82,9
Netherlands	71,9	72,7	73,1	75	75	75,6	74,7
Poland	88,8	89,7	89,2	90,3	90,9	91,1	91,7
Portugal	43,2	44,4	44,4	47,9	49,6	49	49,6
United Kingdom	76,6	76,9	77,1	78,7	77	78,2	78,8

Source: Eurostat

**Table A13 - Youth education attainment level: Females and Males**

	Females		Males	
	2000	2006	2000	2006
Belgium	85,6	85,6	78	79,1
Czech Republic	91,7	92,4	90,7	91,1
Germany	74,8	73,5	74,6	69,8
Greece	84,6	86,6	73,6	75,5
Spain	71,9	69	60,1	54,6
France	83,5	84,3	79,6	80
Italy	74,2	79,4	64,5	71,7
Hungary	84	84,7	83	81,2
Netherlands	75,7	79,6	68,2	69,9
Poland	91,7	93,8	85,8	89,6
Portugal	51,8	58,6	34,6	40,8
United Kingdom	77,3	80,3	75,9	77,3

*Source: Eurostat***Table A14 - Life-long learning: Percentage of the population aged 25-64 participating in education and training over the four weeks prior to the survey**

	2000	2001	2002	2003	2004	2005	2006
Belgium	6,2	6,4	6	7	8,6	8,3	7,5
Czech Republic	:	:	5,6	5,1	5,8	5,6	5,6
Germany	5,2	5,2	5,8	6	7,4	7,7	7,5
Greece	1	1,2	1,1	2,6	1,8	1,9	1,9
Spain	4,1	4,4	4,4	4,7	4,7	10,5	10,4
France	2,8	2,7	2,7	7	7	7	7,5
Italy	4,8	4,5	4,4	4,5	6,3	5,8	6,1
Hungary	2,9	2,7	2,9	4,5	4	3,9	3,8
Netherlands	15,5	15,9	15,8	16,4	16,4	15,9	15,6
Poland	:	4,3	4,2	4,4	5	4,9	4,7
Portugal	3,4	3,3	2,9	3,2	4,3	4,1	3,8
United Kingdom	20,5	20,9	21,3	26,8	29,4	27,5	26,6

*Source: Eurostat***Table A15 - Life-long learning: Females and Males**

	Females		Males	
	2000	2006	2000	2006
Belgium	5,7	7,6	6,7	7,4
Czech Republic	5,4	5,9	5,8	5,4
Germany	4,8	7,3	5,6	7,8
Greece	1	1,8	1	2
Spain	4,5	11,5	3,7	9,3
France	3,1	7,8	2,6	7,2
Italy	4,8	6,5	4,8	5,7
Hungary	3,3	4,4	2,4	3,1
Netherlands	14,7	15,9	16,3	15,3
Poland	4,9	5,1	3,7	4,3
Portugal	3,5	4	3,2	3,7
United Kingdom	23,6	31,2	17,5	22

*Source: Eurostat (2000 figures for Czech Republic and Poland refer respectively to 2002 and 2001)*

**Table A16 - Science and technology graduates: Tertiary graduates in science and technology per 1000 of population aged 20-29**

	2000	2001	2002	2003	2004	2005
Belgium	9,7	10,1	10,5	11	11,2	10,9
Czech Republic	5,5	5,6	6	6,4	7,4	8,2
Germany	8,2	8	8,1	8,4	9	9,7
Greece	:	:	:	:	8	10,1
Spain	9,9	11,2	11,9	12,6	12,5	11,8
France	19,6	20,1	:	22	:	22,5
Italy	5,7	6,1	7,4	9	10,1	11,6
Hungary	4,5	3,7	4,8	4,8	5,1	5,1
Netherlands	5,8	6,1	6,6	7,3	7,9	8,6
Poland	6,6	7,6	8,3	9	9,4	11,1
Portugal	6,3	6,6	7,4	8,2	11	12
United Kingdom	18,5	20	20,3	21	18,1	18,4

Source: Eurostat

**TableA17 - Science and technology graduates: Females and Males**

	Females		Males	
	2000	2005	2000	2005
Belgium	4,9	6	14,4	15,7
Czech Republic	3	4,6	7,8	11,7
Germany	3,6	4,8	12,6	14,5
Greece	6,8	8,7	9,2	11,5
Spain	6,4	7,2	13,3	16,2
France	12,1	12,9	27	32
Italy	4,3	8,7	7,2	14,3
Hungary	2,1	3,1	6,8	7
Netherlands	2,1	3,5	9,5	13,6
Poland	4,8	8,3	8,3	13,9
Portugal	5,4	9,7	7,3	14,3
United Kingdom	11,9	11,4	25,2	25,3

Source: Eurostat (2000 figures for Greece refer to 2004)

**TableA18 - Students (ISCED 5-6) studying in another EU-27, EEA or Candidate country as % of all students**

	2000	2001	2002	2003	2004	2005
Belgium	2,4	2,4	2,4	2,6	2,6	2,6
Czech Republic	1,3	1,5	1,6	1,8	1,8	1,8
Germany	1,8	1,9	1,9	1,9	1,9	2,2
Greece	12,4	10,9	8,6	7,9	7,3	5,9
Spain	1,1	1,2	1,1	1,2	1,2	1,1
France	1,8	1,9	1,9	1,9	2	2
Italy	1,7	1,7	1,6	1,6	1,6	1,5
Hungary	1,7	1,8	1,7	1,7	1,5	1,5
Netherlands	1,9	1,8	1,7	1,8	1,8	1,2
Poland	0,9	0,9	1	1,1	1,2	1,3
Portugal	2,3	2,3	2,3	2,5	2,7	3
United Kingdom	0,6	0,6	0,5	0,5	0,6	0,4

Source: Eurostat

**Table A19 - Inflow of students (ISCED 5-6) from EU-27, EEA and Candidate countries as % of all students in the country**

	2000	2001	2002	2003	2004	2005
Belgium	6,6	6,6	6,8	6,2	7,1	6,7
Czech Republic	1,2	1,9	2,1	2,8	2,8	3,6
Germany	5,1	5,3	5,5	5,6	5,7	4,6
Greece	:	:	1,4	1,9	2	2
Spain	0,4	0,4	0,4	0,5	0,6	0,7
France	2	2	2	2,4	2,4	2
Italy	0,7	0,8	0,7	0,8	0,8	0,8
Hungary	:	2,2	2,1	2	2	2
Netherlands	1,6	1,9	2,2	2,3	2,3	3,2
Poland	0,1	0,1	0,1	0,1	0,1	0,1
Portugal	0,6	0,7	:	0,7	0,7	0,8
United Kingdom	5,9	5,7	4,9	4,8	5,1	5

Source: Eurostat

**Table A20 - Average number of foreign languages learned per pupil at ISCED 2**

	2000	2001	2002	2003	2004	2005
Belgium	1,2	1,3	1,3	1,2	1,3	1,3
Czech Republic	1,1	1	1	1	1	1
Germany	1,2	1,2	1,2	1,2	1,2	1,2
Greece	:	2,2	1,9	:	1,9	1,9
Spain	1,5	1,4	1,4	1,4	1,4	1,4
France	1,5	1,5	1,5	1,5	1,5	1,5
Italy	1,1	1,2	1,2	1,2	1,2	1,4
Hungary	0,7	0,7	0,9	1	1	1
Netherlands	:	2	2	2	2,7	2,7
Poland	1,3	1,3	1,3	1,3	1,2	1,1
Portugal	:	:	1,5	:	:	1,9
United Kingdom	:	:	0,8	0,8	0,7	0,7

Source: Eurostat

**Table A21 - Average number of foreign languages learned per pupil at ISCED 3**

	2000	2001	2002	2003	2004	2005
Belgium	2,2	2,2	2,2	2,2	2,2	2,2
Czech Republic	2	1,9	2	2	2	2
Germany	1,4	1,4	1,3	1,4	1,4	1,4
Greece	:	1,1	1,1	:	1,1	1,1
Spain	1,1	1,2	1,3	1,3	1,3	1,2
France	1,9	1,9	2	2	2	:
Italy	1,2	1,2	1,2	1,2	1,3	1,1
Hungary	1,2	1,2	1,2	1,3	1,3	1,4
Netherlands	:	1,6	1,5	2,6	2,6	2,6
Poland	1,9	1,9	1,9	1,9	1,9	2
Portugal	:	:	:	:	0,8	0,7
United Kingdom	:	:	:	:	0,1	0,1

Source: Eurostat

**Table A22 - Percentage of households who have Internet access at home**

	2002	2003	2004	2005	2006
Belgium	:	:	:	50	54
Czech Republic	:	15	19	19	29
Germany	46	54	60	62	67
Greece	12	16	17	22	23
Spain	:	28	34	36	39
France	23	31	34	:	41
Italy	34	32	34	39	40
Hungary	:	:	14	22	32
Netherlands	58	61	:	78	80
Poland	11	14	26	30	36
Portugal	15	22	26	31	35
United Kingdom	50	55	56	60	63

Source: Eurostat

**Table A23 - Number of broadband lines subscribed in percentage of the population**

	2002	2003	2004	2005	2006
Belgium	6,7	10,1	14	17,4	20,7
Czech Republic	:	:	0,7	4,3	8,4
Germany	3,2	4,8	6,7	10,2	15,3
Greece	0	0	0,2	0,8	2,7
Spain	2	4,3	6,7	10	13,2
France	1,2	4	8,2	13,9	18
Italy	1	2,8	6,1	9,5	13,1
Hungary	:	:	2,2	4,5	7,5
Netherlands	6,3	9,8	14,7	22,4	29
Poland	:	:	0,5	1,9	3,9
Portugal	1,5	3,6	6,4	10,1	12,9
United Kingdom	1,6	3,7	7,4	13,5	19,2

Source: Eurostat

**Table A24 - Networked Readiness Index (NRI) 2006/07 and Digital Opportunity Index (DOI) 2005/06**

	NRI	DOI
Belgium	4,93	0,65
Czech Republic	4,28	0,57
Germany	5,22	0,66
Greece	3,98	0,53
Spain	4,35	0,65
France	4,99	0,64
Italy	4,19	0,63
Hungary	4,33	0,59
Netherlands	5,54	0,71
Poland	3,69	0,51
Portugal	4,48	0,61
United Kingdom	5,45	0,69

Source: World Economic Forum (NRI); ITU and UNCTAD (DOI)