



# Participation in lifelong learning in Europe: What can be measured and compared?

Mircea BADESCU and Michaela SAISANA

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## Abstract

In 2002, the Member States of the European Union committed themselves to develop national lifelong learning strategies (Council Resolution, 2002) covering all contexts (formal, non-formal, informal) and levels (pre-primary, primary, secondary, tertiary, adult) of education and training and all learning activities undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social or employment-related perspective. The concept of lifelong learning shifts responsibility for education and learning to the individual, focusing on the development of individual capabilities and the capacity to learn; it implies a shift from traditional education institutions to diverse learning opportunities that are more process and outcome oriented.

Comparable information and statistical measures are essential to the development and implementation of coherent and comprehensive lifelong learning strategies. Statistics and indicators already form an essential part of existing initiatives in the field of lifelong learning with a view to monitoring progress both in achieving identified targets and in implementing policy objectives. Indicators do not tell the full story but they help to identify differences, similarities and trends and to provide a starting point for further analysis in order to understand better performance and progress.

This publication analyses participation patterns in lifelong learning in European countries using data provided by Eurostat from joint data collection on education Unesco-OECD-Eurostat (UOE) and from EU Labour Force Survey (LFS). Section 1 describes the European political context in the field of lifelong learning. In Section 2, indicators on participation rates in formal education (pre-primary, primary, secondary and tertiary) are discussed. Section 3 sketches upon the progress made in lifelong learning with respect to the EU benchmark. In Section 4, a simple aggregate measure of the overall participation in lifelong learning for population aged 4 to 64 in several European countries is developed and assessed. Section 5 concludes with the main aims and results of this report.

In a nutshell, lifelong learning participation is progressing in the EU27 mainly due to progress in pre-school and school/higher education participation. But it is too slow to reach the benchmark by 2010 unless major progress is achieved in participation in adult learning, where equity needs to be more fully addressed. In particular, some of the new Member States will have to increase their participation rates substantially, in order to catch up with the European average.

# 1. Strategies for lifelong learning in the European Union

The Education Council adopted in 2001 the objectives in terms of quality, accessibility and openness of education and training systems, which Europe should achieve by 2010 (European Commission, 2001). These objectives were followed-up in 2002 by a detailed work programme and the adoption of a resolution committing EU Member States to develop national lifelong learning strategies. This resolution stresses that lifelong learning must cover learning from the pre-school to post-retirement age, including the entire spectrum of formal, non-formal and informal learning. It must be understood as all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective; in this context should be the individual as the subject of learning, highlighting the importance of an authentic equality of opportunities, and quality in learning. The position of education and training within the Lisbon Strategy has been further enhanced by the majority of the EU Member States that give great importance to education and training, lifelong learning and skills development in their Lisbon National Reform Programmes 2005-2008.

A lifelong learning strategy should be an overall framework for education and training policies containing a strategic overview and a coherent set of priorities and the necessary allocation of resources for targeted policy measures. It should include flexible learning pathways and effective transition points between all systems and levels of education and training in order to avoid dead-ends; it should build on partnerships with all relevant stakeholders and must include the necessary implementation dissemination arrangements. It should also be evidence-based. The role of national strategies for lifelong learning should be seen in broader terms of ensuring sustainable funding (European Commission, 2008a).

Most European countries have made progress in defining unified and overarching strategies; explicit lifelong learning strategies which set out national policy priorities and how different sectors relate to each other were developed by the majority of countries (16 member states). Most of these incorporate a comprehensive vision of lifelong learning, covering all types and levels of education and training; some focus on formal education and training systems or on developing specific stages of the lifelong learning continuum. Within such frameworks, progress is evident in pre-primary education and the validation of non-formal and informal learning. However, innovative learning partnerships and sustainable funding for high quality, efficient and equitable education and training still elude many countries; ensuring that reforms are effectively implemented is an important challenge to all (European Commission, 2007a, 2007b, 2008b).

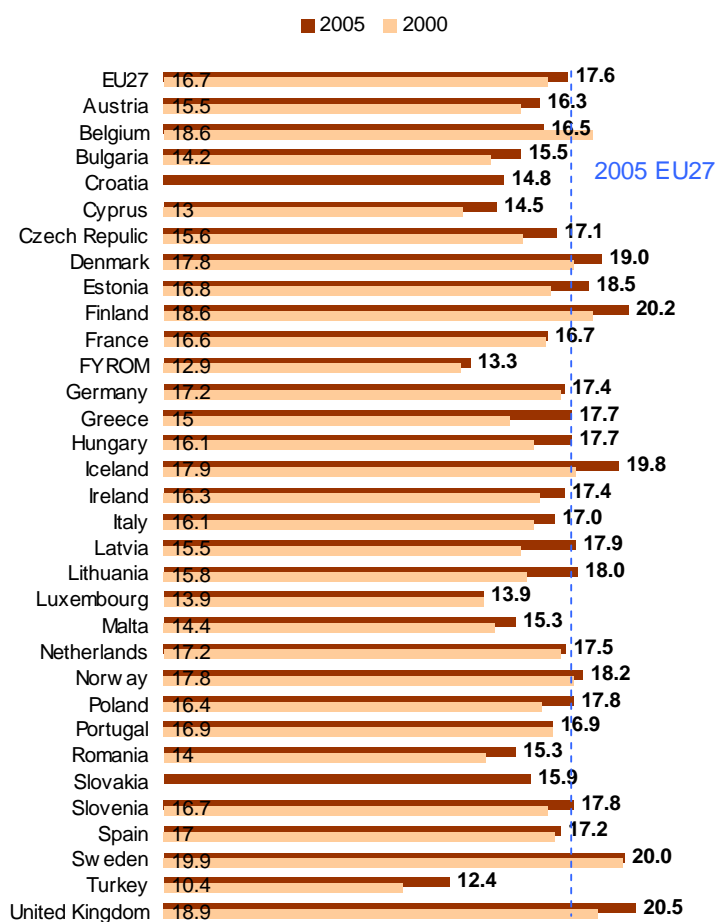
## 2. Participation rates in formal education

Demographic change is affecting key education statistics. In many Member States the numbers in compulsory schooling will fall over the next decade. In some, the decline will reach the later stages of education and labour market entry. In several European countries, the proportion of the 15-19-year-olds in the total population is expected to fall by 30% between 2005 and 2015 whereas in others the decline is expected to be as high as 40%. Reduced cohorts demanding school places may offer a window of opportunity to address access and quality issues more easily. At the same time, while youth cohorts may be smaller, they can expect to stay longer in formal education.

**Figure 1**

### Expected years in education and training for students in European countries

*Expected school years of pupils and students at ISCED levels 0 to 6*



*Data source:* Eurostat (UOE data collection)

Detailed information on the data is provided in the Annex (Table A.1)

The number of years that pupils and students in the EU can expect to spend in education (ISCED levels 0-6) has increased by 1 year between 2000 and 2005. The increase is even higher (over 2 years) in Latvia and Lithuania (Figure 1). This indicator represents an important measure of the

internal efficiency of an educational system; relatively higher school life expectancy indicates greater probability for children to spend more years in education and higher overall retention within the education system.<sup>1</sup> It must be noted that the expected number of years does not necessarily coincide with the expected number of grades of education completed due to grade repetition.

Participation in pre-primary education made good progress in the EU (Figure 2). Between 2000 and 2005 the average pre-primary enrolment rates for 4-year-olds increased by 3 percentage points (from 82.8% to 85.7%) and the improvement was evident in the majority of the Member States. Participation rose by around 6% or more in Bulgaria, Czech Republic, Latvia and Portugal and by even 16% in Romania and Sweden. Despite this notable increase, more than 2/3 of the countries reported enrolment rates in 2005 at 80% or below; in 3 Member States -Poland, Ireland and Finland- enrolment was lower than 50% and even lower in Turkey and FYROM. However, we should note that the relatively low participation rates in pre-primary education in Finland and Ireland are due to the fact that home care often substitutes preschool education, without this, however, being captured by the Early Childhood Education indicator. Increasing participation in early childhood education is crucial for European countries, as it is during these early years of age that the foundations are laid for subsequent learning and achievements. Moreover, the pre-primary education has shown to have the highest rates of return of the whole lifelong learning continuum, especially for the most disadvantaged, and the results of this investment sum up over time (European Commission, 2006).

Participation in primary education (ISCED level 1) in 2005 was reported to be well above 90% in most countries and showed in general small variations among the EU Member States (Figure 2). Surprisingly, Malta and Lithuania reported a decrease between 2000 and 2005 of more than 7 percentage points. Participation rates were near 90% or slightly higher for Turkey and FYROM.

Demand for secondary education (ISCED levels 2 and 3) continues to grow in the EU. In only 3 Member States enrolment rates failed to increase between 2005 and 2000. In Greece, the increase was near 10% (Figure 2). In general, net enrolment rates in secondary education were well above 85% in the majority of the Member States, with the exception of Luxembourg, Malta, Portugal and Romania where participations rates ranged between 80.8 and 83.8%.<sup>2</sup> Increasing trends can be considered as reflecting improving participation at this level of education.<sup>3</sup>

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<sup>1</sup> Caution is required when school life expectancy is used for country comparison; neither the length of the school-year nor the quality of education is necessarily the same in each country.

<sup>2</sup> In some countries the differences in coverage between the two data sources (UOE and LFS) can be sizeable for the completion of upper secondary education. Starting with 2006, Eurostat implements a refined definition of the educational attainment level 'upper secondary' in order to increase the comparability of results in the EU.

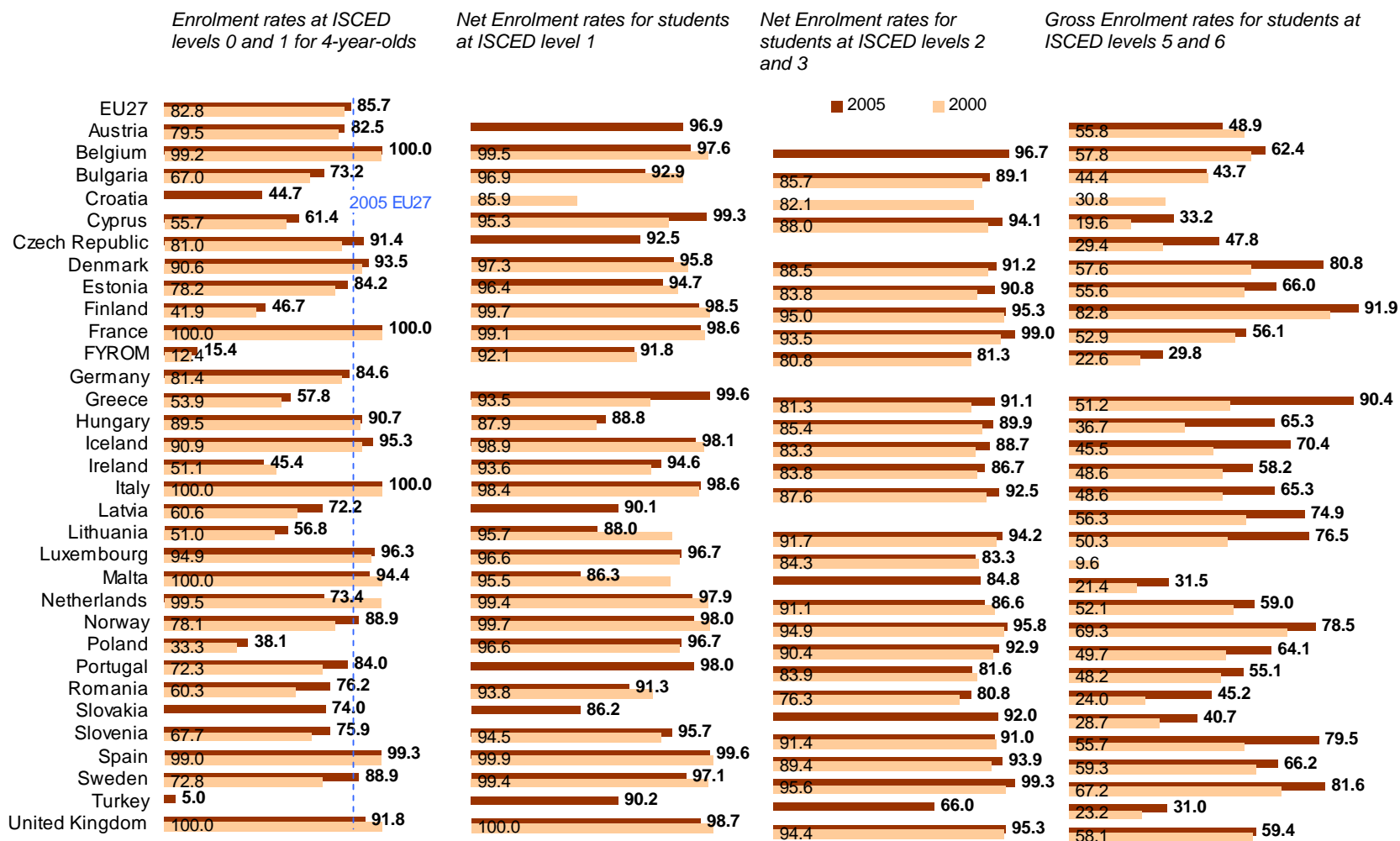
<sup>3</sup> If the NER is below 100%, then the difference with 100% provides a measure of the proportion of students not enrolled at the specified level of education. However, since some of these children/youth could be enrolled at other levels of education, this difference should in no way be considered as indicating the percentage of students not enrolled.

Progress in the gross enrolment rates in tertiary education (ISCED levels 5 and 6) has been spectacular since 2000. Indeed, some Member States (like Hungary, Lithuania and Slovenia) saw their rates increase by over 25% (Figure 2). Although tertiary enrolment rates were over 50% in nearly all Member States in 2005 and above 60% in almost half of them, there were significant variations across Europe. Only Greece and Finland reported tertiary enrolment rates higher than 90%. On the other end, FYROM and Turkey reported participation rates in tertiary education near or below 30%.



**Figure 2**

**Participation in Formal Education for students in European countries**



Data source: Eurostat (UOE data collection); Detailed information on the data is provided in the Annex (Table A.2 and Table A.3)

### 3. Monitoring progress in lifelong learning

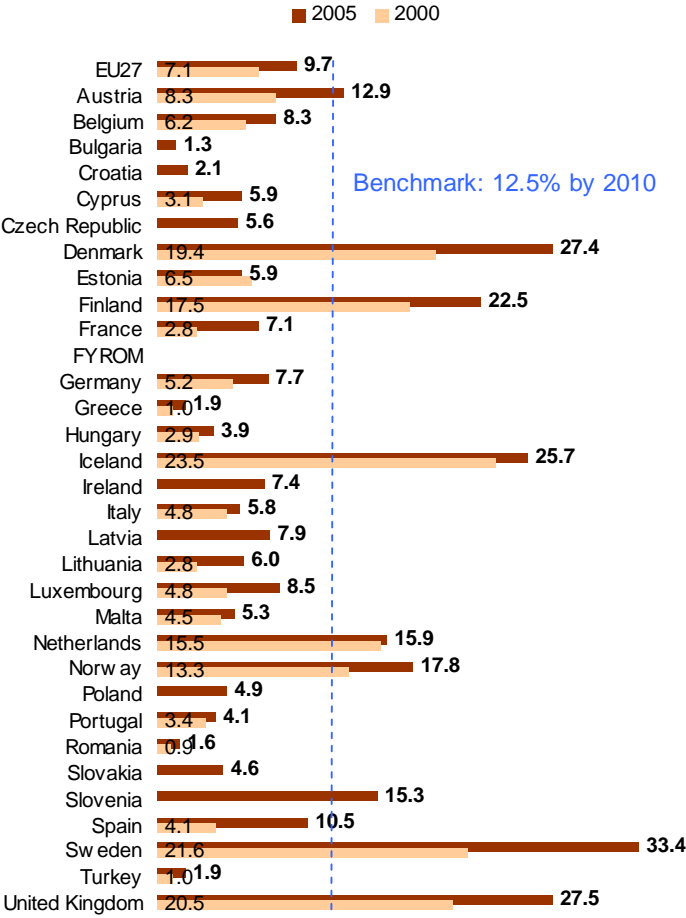
Education and training have an important place in the integrated guidelines for delivering the revised Lisbon strategy for jobs and growth. As part of this overall strategy, the Council set out broad common objectives for the education and training systems of the EU. The Education and Training 2010 Work Programme supports the actions of the member states to achieve these objectives. It is implemented through the open method of coordination, using indicators and benchmarks to support evidence-based policy making and to monitor progress. Comparable information and statistical measures are essential to the development and implementation of coherent and comprehensive lifelong learning strategies (Badescu and Nardo, 2006). Thus indicators already form an essential part of existing initiatives in the field of lifelong learning with a view to monitoring progress both in achieving identified targets and in implementing policy objectives. They help to identify differences, similarities and trends and can provide a good starting point for further analysis in order to understand better performance and progress (European Commission, 2007c).

The Council in May 2007 identified a framework of 16 core indicators to monitor progress towards the Lisbon objectives and has invited the Commission to make full use of those indicators (European Commission, 2007a, 2007b). These 16 core indicators are largely based on existing data and their definition has been already broadly established. Moreover, the 2008 joint progress report has called for further development of indicators and benchmarks in line with the Council conclusions of May 2007 (European Commission, 2008a). Following proposals from the Commission, the Council has recommended that monitoring progress in lifelong learning will be covered by indicators on participation of adults in lifelong learning (already available) and on adult skills (which will be made available through the new surveys). The benchmark is that 12.5% of the population aged 25-64 should participate in lifelong learning by 2010.

Survey results for 2005 show that an average of 9.7% of 25-64-year-olds participated in some form of lifelong learning activity at the EU27 level but there are notable differences between Member States (Figure 3). Only seven Member States exceeded by far the 12.5% benchmark –Austria, Denmark, Finland, Slovenia, Sweden and the UK– and Spain is on the right track (10.5%). The Nordic countries achieved systematically higher and increasing participation rates from 2000 onwards, reaching 22-33% in 2005. Iceland and Norway are also performing very well. Many EU countries struggle to reach or remain just near 5%.

**Figure 3**  
**Participation of adults in lifelong learning**

Percentage of the adult population aged 25 to 64 participating in education and training



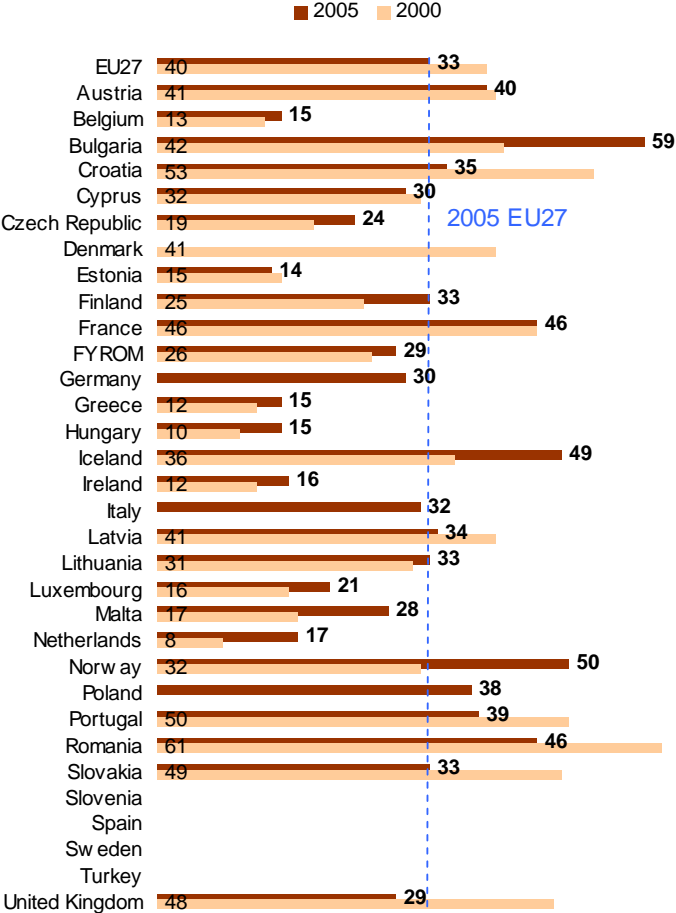
Data source: Eurostat (Structural Indicators webpage),  
 Detailed information on the data is provided in the Annex (Table A.4)

To a certain extent the slow progress between 2000 and 2005 in the participation of adults in education and training activities is confirmed by the provisional results of the third Continuing Vocational Training Survey - CVTS 3 (Figure 4). Participation in continuing vocational training measured by the number of participants in CVT courses as percentage of employees has decreased in 2005 compared to 1999 in nine countries for which data exists (Belgium, Denmark, Germany, Greece, the Netherlands, Finland, Sweden, United Kingdom and Norway). There are also different patterns of participation among Member States; an increased proportion of the employees participate in CVT courses in most of the new Member States which are now catching up in participation with old member states.

**Figure 4**

**Participation in continuing vocational training in EU countries. 1999-2005**

*Participants in continuing vocational training courses as percentage of employees in all enterprises*



*Data source: Eurostat (CVTS),  
Detailed information on the data is provided in the Annex (Table A.5)*

#### 4. An aggregate measure of countries participation in lifelong learning

Lifelong learning should be viewed as an overarching concept covering all contexts (formal, non-formal, informal) and levels (pre-school, primary, secondary, tertiary, and adult, continuing) of education and training. It includes all learning activity undertaken throughout life with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective. *Life wide learning* is another dimension of lifelong learning and includes all learning activity whether formal, non-formal or informal. However, lifelong learning is not simply a summation of traditional education programmes and modern learning opportunities. Lifelong learning focuses on the development of individual capabilities and the personal capacity to learn; it implies a shift from traditional education institutions to a diverse field of traditional and modern learning opportunities that are more process and outcome oriented and have a modular structure; responsibility for education and learning shifts to the individuals themselves.

Two definitions of lifelong learning that describe the views expressed above are offered by the European Commission and Aitcheson:

“Lifelong learning embraces all learning activity undertaken throughout life, with the aim of improving knowledge, skills/competences and/or qualifications for personal, social and/or professional reasons.” (European Commission, 2001)

“Lifelong education is a comprehensive and visionary concept which includes formal, non-formal and informal learning extended throughout the lifespan of an individual to attain the fullest possible development in personal, social and vocational and professional life. ... A key purpose of lifelong learning is democratic citizenship, connecting individuals and groups to the structures of social, political and economic activity” (Aitcheson, 2003: 165)

The Eurostat Classification of Learning Activities (Eurostat, 2005) is one of the tools used for key statistical measurement of lifelong learning issues; it has been originally designed to serve the scope of the European Union Adult Education Survey. The classification is intended to cover all types of learning opportunities and education and learning pathways and is designed to serve as an instrument for compiling and presenting comparable statistics and indicators on learning activities both within and across countries. It was constructed to be applied to statistical surveys that collect quantitative information on different aspects of individuals' participation in learning. It covers all intentional and organised learning activities for all age groups. The definition of lifelong learning remains consistent with the ISCED where learning is understood to be “*any improvement in*

*behaviour, information, knowledge, understanding, attitude, value or skills*’. While ISCED describes learning by the intended outcome, in the Classification the focus is on the activities of learning.

## **Methodology**

It is rather difficult to develop a precise measurement of participation in lifelong learning using simple statistics. To better capture the participation patterns in lifelong learning an index is developed herein and further assessed in terms of its robustness to a number of assumptions. The index provides a complementary picture of the very different rates of participation in pre-primary, primary, secondary, tertiary education and adult learning for 4-64 aged population across European countries. The Participation in Lifelong Learning Index is based on three underlying indicators:

- The Early Childhood Education indicator measures participation of 4-year olds in education at ISCED levels 0 and 1,
- The Formal Education indicator describes participation in primary, secondary and tertiary education of population aged 5 to 29, and
- The Education & Training indicator expresses the proportion of population aged 25 to 64 who stated that they received education or training in the four weeks preceding the Labour Force Survey as percentage of total population aged 25-64.

The Index is calculated for two years, 2000 and 2005, for 32 European countries and the EU27. Of the 198 values of interest (3 indicators x 33 entities x 2 years), we were able to ascertain information on 182 values (91.9%). In the analysis, we estimated missing data by regressing the indicator with missing values versus the other two indicators or by using the timeseries data 2000-2005.

The formula to calculate the Index is the simple arithmetic average of the three normalised indicators (using a distance to a best performer method):

$$Y_c = \sum_{q=1}^3 w_q \frac{x_{c,q}}{\max_{t=2000,2005}(x_{c,q})}$$

where  $x_{c,q}$  expresses the raw indicator value of country  $c$  in the indicator  $q$ , the denominator  $\max(x_{c,q})$  is the raw indicator value corresponding to the best performing country in either 2000 or 2005, and  $w_q$  is the weight assigned to the indicator  $q$ . Clearly  $\sum_{q=1}^3 w_q = 1$ . We therefore assigned equal weights to the three indicators considering that three stages of participation in learning are of equal importance.

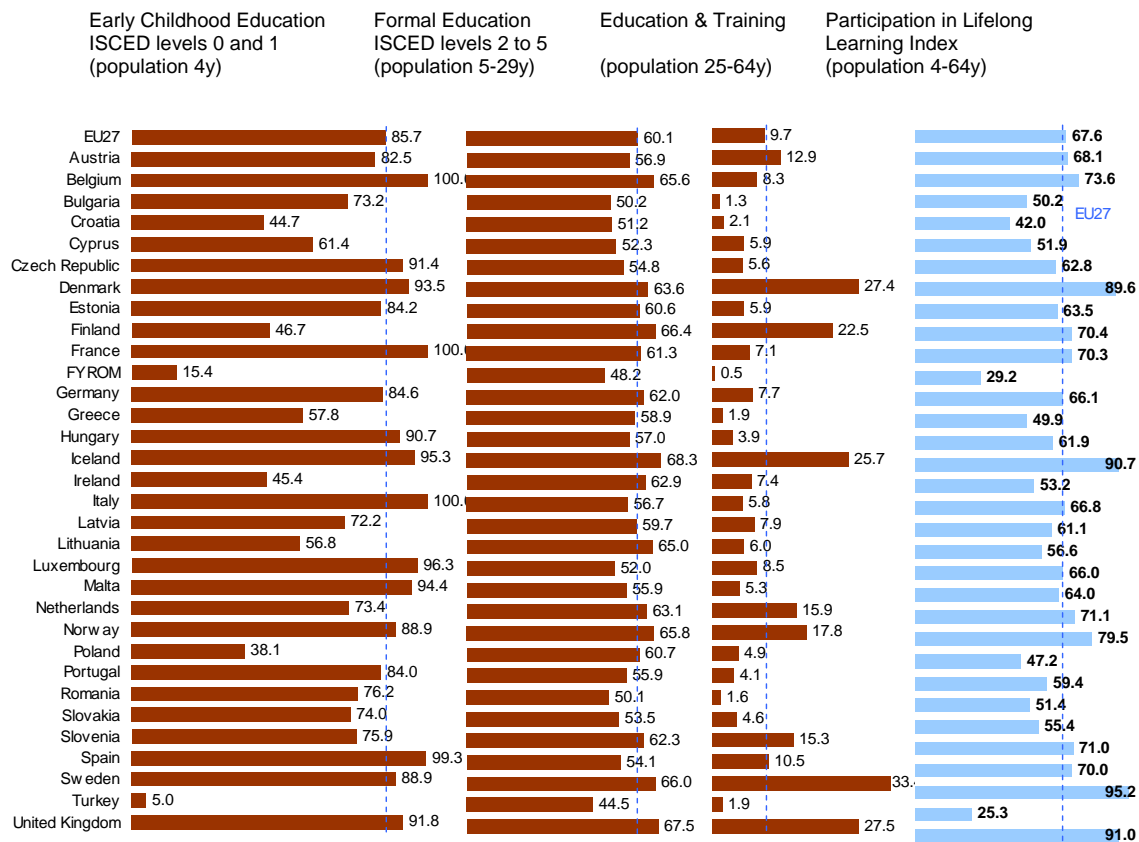
## Results

The 2005 country scores in the overall Index and in the three underlying indicators are presented in Figure 5. EU countries received overall Index scores in the range from 47.2 (Poland) to 95.2 (Sweden) and the EU27 average is estimated at 67.7. The ideal (feasible) performance given the 2000-2005 datasets would have been a 100% participation in Early Childhood Education, a 33.4% participation in Formal Education and 68.3% in Education & Training. Three EU countries –Sweden, United Kingdom and Denmark– have very high Index scores (over 90) indicating exceptional participation rates in lifelong learning activities for the population aged 4 to 64. Iceland and Norway also perform very well. For Austria, Belgium, Estonia, Finland, France, Germany, Italy, the Netherlands, Slovenia and Spain, the Index scores are near or slightly above the EU27 average. Particularly low are the 2005 Index scores in Turkey, FYROM, Croatia, Bulgaria, Greece and Portugal (scores below 50). In these countries, there is considerable room for improvement in particular as far as participation in Education & Training activities during 25-64 years of age is concerned, and participation in Early Childhood Education.

**Figure 5**

### 2005 Participation in Lifelong Learning in 32 European Countries

*An aggregate measure on participation in lifelong learning for 4-to-64 year olds and the corresponding indicator breakdown*

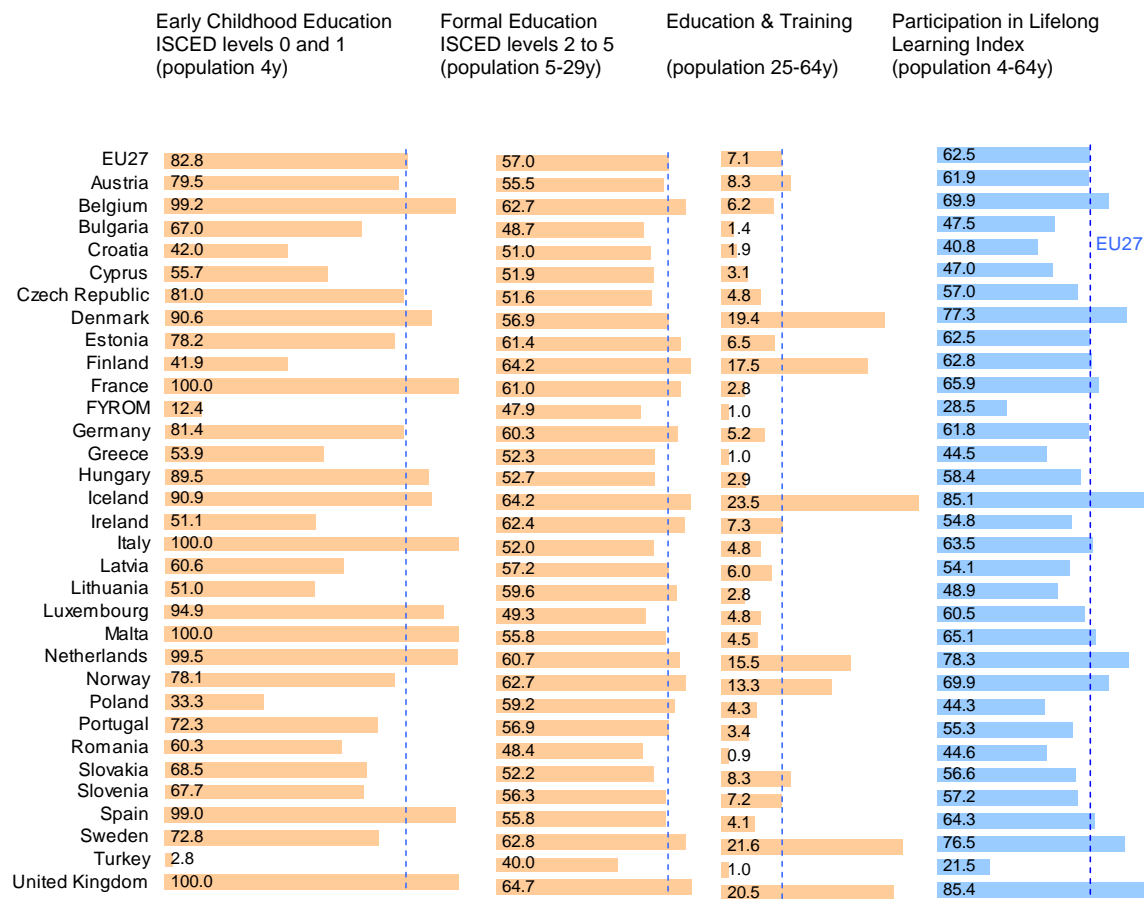


The 2000 country scores in the Lifelong Learning Participation Index and in the three underlying indicators are presented in Figure 6. Country scores ranged from 44.5 (Greece) to 85.4 (United Kingdom) and the EU27 average is estimated at 62.5. High levels of overall participation were estimated for Sweden, United Kingdom and Denmark in 2000. This was also the case for Norway and Iceland. Compared to the previous discussion, it is evident that these countries have progressed even further since then, some notably faster than the EU average. Overall, the Lifelong Learning Participation Index increased by 5.1 points between 2000 and 2005 at the EU27 level. In that period, UK increased by 5.6, Denmark by 11.3, and Sweden by 18.7. It can hardly be a coincidence that the five best performing countries were also those that developed a coherent lifelong learning strategy at the national level.

**Figure 6**

**2000 Lifelong Learning Participation Index for 4-64y in 32 European Countries**

*An aggregate measure on participation in lifelong learning for 4-to-64 year olds and the corresponding indicator breakdown*





Both Figure 5 and Figure 6 offer information on the detailed breakdown of the Index scores into the underlying indicators scores. Most of the discussion has already been covered in Section 2 and Section 3. One remark that is worth adding here is that the Formal Education indicator which captures participation in primary, secondary and tertiary education of population aged 5 to 29, or in other words the '*school dimension*' has increased to 60% in 2005 (from 57% in 2000), which is translated to nearly 2 million additional learners since 2000.

### *Robustness Assessment*

The selection of an appropriate methodology is central to any exercise attempting to capture and summarize the interactions among the individual indicators included in a composite indicator or ranking system (Saisana and Tarantola, 2002). The literature review offered in the JRC/OECD (2008) Handbook on composite indicators discusses the plurality of the approaches that have been used in building a composite indicator and shows that some of the methodologies are suited (more or less) to the purposes for which they are employed. Several practitioners have noted that the encoding process of building a composite indicator or a ranking system is fraught with uncertainties of different order (Saisana *et al.*, 2005). As a result, an uncertainty analysis should naturally include a careful mapping of all these uncertainties onto the space of the inferences. When this is done, the space of the inference is either narrow enough or too wide to be meaningful. The former outcome is the desired one, whilst the latter outcome calls in turn for a revision of the Index, for example by further collection of indicators.

To evaluate the robustness of the Index, we varied assumptions involving the normalisation scheme, the weighting method and the aggregation rule (Table 1). This multi-modeling approach we employed has already proven to be useful in the development and validation of several composite indicators listed in the Annex (Table A. 6) and was also included in the JRC/OECD (2008) Handbook on Composite Indicators. Our approach consists of simulations (saturated sampling) based on combinations of three main assumptions on (a) the normalisation method to scale the raw data of the three indicators, (b) the weights attached to the indicators and (c) the aggregation rule. We carry out 12 simulations (3 normalization methods x 2 weighting methods x 2 aggregation rules).

**Table 1**

**Scenarios for the assessment of the Lifelong Learning Participation Index**

<b>Assumption</b>	<b>Alternatives</b>	<b>Comments</b>
Normalisation method	<ul style="list-style-type: none"> <li>Distance to best performer (with max=100)           <math display="block">I^t_{c,q} = \frac{x^t_{c,q}}{\max^{t_1,t_2}(x^t_{c,q})} * 100</math> </li> <li>Min-max (with min=10, max=100)           <math display="block">I^t_{c,q} = \frac{x^t_{c,q} - \min^{t_1,t_2}(x^t_{c,q})}{\max^{t_1,t_2}(x^t_{c,q}) - \min^{t_1,t_2}(x^t_{c,q})} * 90 + 10</math> <math display="block">t_1 = 2000, t_2 = 2005</math> </li> <li>Standardisation (with mean=50, std=15)           <math display="block">I^t_{c,q} = \frac{x^t_{c,q} - \text{mean}^{t_1,t_2}(x^t_{c,q})}{\text{std}^{t_1,t_2}(x^t_{c,q})} * 50 + 15</math> </li> </ul>	<p>Normalisation is required prior to any data aggregation as the indicators in a data set often have different measurement units. We have used three popular methods: Distance to best performer, Min-Max and Standardization. The first two methods are particularly sensitive to extreme values or outliers. In the dataset used in the present analysis, there are no such extreme values and thereafter all three normalization methods are suitable.</p>
Weighting method	<ul style="list-style-type: none"> <li>Equal weighting,</li> <li>Factor analysis</li> </ul>	<p>There is both a technical and a socio-political component in this consideration. Although there are good reasons to consider that all three indicators are equally important in describing participation in lifelong learning, there are no theoretical justifications for the selected weights. In the analysis, in order to examine whether different weights give a very different final ranking, we have considered the two most popular weighting methods: equal weighting and factor analysis weights (Nicoletti <i>et al.</i>, 2000).</p>
Aggregation rule	<ul style="list-style-type: none"> <li>Additive           <math display="block">Y^t_c = \sum_{q=1}^3 w^t_q I^t_{c,q}</math> </li> <li>Multiplicative           <math display="block">Y^t_c = \prod_{q=1}^3 \left( I^t_{c,q} \right)^{w^t_q}</math> </li> </ul>	<p>When a set of individual indicators is aggregated, a fundamental issue is compensability that refers to the existence of trade-offs, i.e. the possibility of compensating a disadvantage on some indicators by a sufficiently large advantage on another indicator, whereas smaller advantages would not do the same. A simple functional form that deals with this compensability issue is the multiplicative (or else termed geometric aggregation).</p>

In spite of versatile alternative methodological assumptions considered in the sensitivity analysis, relatively few countries (5 of 33) shifted more than 5 positions under any scenario in 2005, whilst the impact was slightly more evident in 2000 (13 countries of 33 shifted more than 5 positions) (Table 2). It follows that most countries were not markedly affected by the choice of assumptions used to

calculate the 2005 scores. Median ranks from the 12 scenarios varied hardly at all from the Index ranks ( $r = 0.99, p < 0.001, n = 33$  for ranks in both 2000 and 2005). For 31 of the 33 countries, median and Index ranks differed by no more than 2 positions in 2000. For 2 countries—Hungary and Spain—they differed by 3 positions. In 2005, median and Index ranks did not differ by more than 2 positions. These results suggest that the Lifelong Learning Participation Index is a reliable summary measure of the three selected indicators, and it is not biased against particular methodological scenarios.

**Table 2**

**Results of uncertainty analysis**

The uncertainty analysis varied the normalisation method, the weighting scheme and the aggregation rule in order to assess a country's performance in the Lifelong Learning Participation Index. The simple arithmetic average of the three indicators (scaled using the “distance to the best performer” approach) generated "Index" ranks and scores. The 12 alternative models examined in the uncertainty analysis produced the country median and range per year.

<i>YEAR=2005</i>		<i>Ranks</i>			<i>YEAR=2000</i>		<i>Ranks</i>		
<b>Country</b>	<b>Scores Index</b>	<b>Index</b>	<b>Median</b>	<b>Range</b>	<b>Country</b>	<b>Scores Index</b>	<b>Index</b>	<b>Median</b>	<b>Range</b>
		<b>(12 models)</b>					<b>(12 models)</b>		
Sweden	93.6	1	1	1	United Kingdom	84.9	1	2	1-2
Iceland	91.4	2	3	2-3	Iceland	84.5	2	1	1-2
United Kingdom	91.1	3	3	2-3	Sweden	77.0	3	3	3-5
Denmark	87.5	4	4	4	Netherlands	76.7	4	4	3-5
Norway	80.8	5	5	5	Denmark	73.7	5	5	3-6
Belgium	75.8	6	7	6-11	Norway	71.6	6	6	5-7
Finland	74.7	7	6	6-9	Belgium	71.2	7	8	6-9
Netherlands	72.7	8	7	6-8	Finland	67.5	8	7	7-12
Slovenia	72.0	9	8	7-9	France	66.9	9	10	8-22
France	70.5	10	10	10-13	Estonia	64.9	10	10	9-14
Germany	67.8	11	13	11-15	Germany	63.5	11	12	11-16
EU27	67.7	12	12	11-13	Malta	63.0	12	14	9-17
Austria	66.2	13	13	9-14	Spain	62.5	13	16	10-20
Spain	65.6	14	14	10-17	EU27	62.1	14	13	10-14
Estonia	64.7	15	16	14-18	Austria	60.7	15	15	8-16
Italy	64.6	16	17	14-19	Ireland	59.8	16	16	10-23
Latvia	62.4	18	17	15-21	Italy	59.4	17	18	11-20
Lithuania	62.5	18	19	14-23	Slovenia	57.6	18	17	13-19
Malta	62.0	19	20	17-21	Portugal	56.4	19	21	19-24
Hungary	61.1	21	21	20-24	Hungary	56.0	20	23	18-26
Luxembourg	61.1	21	20	14-23	Latvia	55.8	21	20	16-24
Czech Republic	60.4	22	22	19-23	Luxembourg	55.4	22	23	17-26
Ireland	58.6	23	22	18-25	Slovakia	54.6	23	22	12-24
Portugal	58.4	24	24	22-25	Czech Republic	54.2	24	23	20-25
Slovakia	53.9	25	26	24-27	Lithuania	53.3	25	25	21-27
Greece	53.1	26	28	26-29	Poland	49.7	26	26	24-30
Poland	52.5	27	27	25-30	Cyprus	46.9	27	27	25-27
Cyprus	50.5	28	28	23-28	Greece	45.2	28	29	28-30
Romania	48.6	29	29	27-29	Bulgaria	45.1	29	29	26-30
Bulgaria	47.6	30	30	28-31	Romania	42.8	30	31	28-31
Croatia	42.2	31	31	30-31	Croatia	41.6	31	30	28-31
FYROM	30.4	32	32	32-33	FYROM	30.3	32	32	32
Turkey	25.2	33	33	32-33	Turkey	20.0	33	33	33

## 5. Conclusions

Measuring participation in lifelong learning in the EU Member States is prerequisite to assess the commitment of Europe to progress in lifelong learning. In fact, it was in 2002 when the Member States of the European Union committed themselves to develop national lifelong learning strategies (Council Resolution, 2002) that cover all contexts (formal, non-formal, informal) and levels (pre-primary, primary, secondary, tertiary, adult) of education and training and learning activities undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social or employment-related perspective.

This report describes the European political context in the field of lifelong learning, and analyses key indicators of education and training participation rates at various life-time stages from 4 to 64 years in two time points in 2000 and 2005. These years were selected because of the comparative potential of analyzing participation in education and training before and after the EU commitment in 2002. A main contribution of the present report is the development of a simple aggregate measure – the Lifelong Learning Participation Index- to summarise overall participation in lifelong learning for population aged 4 to 64 in European countries using data provided by Eurostat from joint data collection on education Unesco-OECD-Eurostat (UOE) and from EU Labour Force Survey (LFS).

The main conclusions of on participation issues in lifelong learning in Europe are that:

- **5 countries have very high performance in lifelong learning participation: Sweden, United Kingdom, Denmark, Norway and Iceland.** They are moving towards making lifelong learning a reality for the greater majority of their citizens aged 4 to 64. Slovenia, France, Finland, Austria, Spain and the Netherlands are following closely behind. Overall, the Lifelong Learning Participation Index increased by 5.1 points between 2000 and 2005 (from 62.5 to 67.7) at the EU27 level. It can hardly be a coincidence that the five best performing countries were also among those that developed a coherent lifelong learning strategy at national level with a comprehensive vision covering all types and levels of education and training throughout life.
- **All 4 year olds in Belgium, Italy and France participate in pre-school education.** Spain, Malta and Luxembourg are close behind and only 12 countries exceed the Barcelona target of 90% participation. Many countries have achieved significant increases since 2000 (Slovenia +11%; Romania +15%; Germany +10 %).
- **There are 2 million more 5-29-year-olds in education and training in the EU in 2005 than in 2000.** In 2005, 60% of 5-29 year-old Europeans participate in education. This is

comparable to the US, and 18% higher than Japan. Increasing participation in pre-primary and higher education has been enough to more-than outweigh smaller cohorts.

- **Time spent by young people in education and training is increasing in all European countries.** Youth cohorts are smaller but they can expect to stay more years in education. At 20 years (or almost), it is highest in Finland, UK, Sweden and Iceland.
- **Less than 10% of adults in 2005 in the EU participate in lifelong learning.** This reflects significant progress since 2000 (2.6 percentage points), but too slow to reach the benchmark of 12.5% by 2010. Only seven Member States exceeded by far the 12.5% benchmark – Austria, Denmark, Finland, Slovenia, Sweden and the UK– and Spain is on the right track (10.5%). The Nordic countries achieved systematically higher and increasing participation rates from 2000 onwards, reaching 22-33% in 2005. Iceland and Norway are also performing very well. Many EU countries struggle to reach or remain just near 5%. Thus, catching up with participation in lifelong learning for adults remains the main challenge in many European countries.

The Lifelong Learning Participation Index is by no means exhaustive. There are several indicators that could have been considered in order to provide a holistic picture of lifelong learning. We name two notable examples of composite indicators in the field that share one common feature: they are both based on the four-pillar framework of lifelong learning (learning to know, to do, to live together, to be) that was suggested by the UNESCO's International Commission on Education for the Twenty-first Century (Delors *et al.*, 1996).

- The *Composite Learning Index* (CLI). Though the benefits, both at personal and at community level, were evident to most Canadians, until the Canadian Council on Learning created the Composite Learning Index in 2006 there was no means to measure how Canada and its communities perform across the full spectrum of learning. The CLI summarizes a wide range of about 20 specific measures of learning, which include participation rates in formal, non-formal and informal learning activities, achievements, charitable aspects, sports and cultural interests (<http://www.ccl-cca.ca/cli/>).
- The *European Lifelong Learning Index* (ELLI). Inspired by the CLI, the Bertelsmann Stiftung has set up a new project, trying to develop a similar Index for the European Union and its Member States. The ELLI is currently under development and it represents the first attempt, at the European level, to propose a way to measure lifelong learning and its multiple economic and social benefits. A framework of about 50 indicators will be included in order to capture the diverse and vast nature of lifelong learning in Europe (<http://www.elli-project.bertelsmann-stiftung.de/>).

The aim of the aggregate measure developed and assessed in this report is much more modest. The objective is to summarise participation rates in lifelong learning for the population aged 4 to 64 in European countries, covering formal education from 4 to 29 years and non-formal and informal learning activities of the population aged 25 to 64. As such, the results are indicative, exploratory in their nature and tentative in their interpretation. We preferred to use only three indicators to build this summary measure, so as to be as concise as possible, bearing in mind that several aspects of participation in lifelong learning are not explicitly captured by the three underlying indicators. Nevertheless, the Index revealed wide variations among the Member States of the EU. In 2005 and out of a possible 100 points, countries received overall Index scores ranging from roughly 50 (Bulgaria, Cyprus, Greece and Romania) to roughly 90 or slightly higher (Denmark, Sweden and UK).

We subjected the Lifelong Learning Participation Index to a robustness assessment. To this end, we conducted an uncertainty analysis to determine the effect of varying several methodological assumptions on the ranks generated by the Index. Ranks were only used during the robustness assessment and not to provide an absolute classification. The Index focus was on providing a summary picture rather than place European countries in a classification ladder. The effect of altering the main assumptions related to the normalization method of the three underlying indicators, the weights attached to the indicators and the aggregation rule proved to be minimal: median ranks produced by 12 different combinations of assumptions varied little from the Index ranks. It follows that the Index gives a fair representation of the scenarios and it is not biased versus certain methodological preferences.

The verification offered in the present work is nevertheless partial. We have implicitly assumed that all the plurality of the debate (i.e. the sources of uncertainty) is captured by the alternative normalization method, the variability in the weights (equal weights or factor analysis-derived weights) and the aggregation rule (additive or multiplicative). A main issue is whether the three underlying indicators could suffice to provide an indicative, yet holistic, measure of participation in a field that spans so many life stages and settings as is the lifelong learning. We believe that these three indicators do not cover the entire story. However, we do think that the Index points to the correct direction and is able to benchmark countries participation in lifelong learning and be used to track progress over time. Data requirements on these three indicators are very modest, which implies no particular data collection limitations.

It is, however, imperative to consider additional indicators of participation in lifelong learning, example home care of young children, participation rates in sports and cultural activities, use of internet, so as to eventually revise the set of indicators. Even, if additional indicators are included and different sources of uncertainty are acknowledged, it should be clear to the reader that this can be done in principle without difficulty, following a similar approach to the one presented herein.

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## ANNEX 1 – DATA USED IN THIS PUBLICATION

**Table A.1: Expected years in education and training for students in European countries (d)**

*Expected school years of pupils and students at ISCED levels 0 to 6*

	EU27	BE	BG	CZ	DK	DE	EE	IE	GR	ES	FR	IT	CY	LV	LT	LU	HU
<b>2000</b>	16.7	18.6	14.2	15.6	17.8	17.2 i	16.8	16.3	15	17	16.6	16.1	13 i	15.5	15.8	13.9 i	16.1
<b>2005</b>	17.6	16.5	15.5	17.1	19	17.4	18.5	17.4	17.7	17.2	16.7	17	14.5	17.9	18	13.9	17.7
	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	HR	MK	TR	IS	LI	NO
<b>2000</b>	14.4 i	17.2	15.5	16.4	16.9	14 i	16.7 i	:	18.6	19.9	18.9 i	:	12.9 i	10.4	17.9	13.5 i	17.8
<b>2005</b>	15.3	17.5	16.3	17.8	16.9	15.3	17.8	15.9	20.2	20	20.5	14.8	13.3	12.4	19.8	16.1	18.2

Data source: Eurostat (UOE data collection)

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

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

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

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

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

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

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

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

**Table A.2: Enrolment in educational institutions of 4-year olds in European countries**

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

	EU27	BE	BG	CZ	DK	DE	EE	IE	GR	ES	FR	IT	CY	LV	LT	LU	HU
<b>2000</b>	82.8	99.2 i	67	81	90.6	81.4	78.2	51.1 i	53.9	99	100	100	55.7	60.6	51	94.9	89.5
<b>2005</b>	85.6	100 i	73.2	91.4	93.5	84.6	84.2	45.4 i	57.8	99.3	100	100	61.4	72.2	56.8	95.4	90.7
	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	HR	MK	TR	IS	LI	NO
<b>2000</b>	100	99.5	79.5	33	72.3	60.3	67.7	:	41.9	72.8	100	:	12.4	:	90.9	:	78.1
<b>2005</b>	94.4	73.4	82.5	38.1	84	76.2	75.9	74	46.7	88.9	91.8	44.7	15.4	5	95.3	50.6	88.9

Data source: Eurostat (UOE data collection)

(:) Missing or not available, (i) See information notes

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

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

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

NL: The enrolment figures for 2003 and 2006 are underestimated as they are based on pupils in pre-primary and primary education on 1st of October.

Between 1st of October and 31st of December, a quarter of the 3 years-old become 4 years-old and has the right to enter pre-primary education. Almost all of them do enter education, which increase sizeable the participation figures of 4-year olds to nearly 100%.

**Table A.3: Participation in education and training in European countries (d)**  
*Enrolment of students as percentage of population (i)*

2000	EU27	BE	BG	CZ	DK	DE	EE	IE	GR	ES	FR	IT	CY	LV	LT	LU	HU
ISCED 1	:	99.5	96.9	:	97.3	:	96.4	93.6	93.5	99.9	99.1	98.4	95.3 e	:	95.7	96.6	87.9
ISCED 2 to 3	:	:	85.7	:	88.5	:	83.8	83.8	81.3	89.4	93.5	87.6 e	88 e	:	91.7	84.3	85.4
ISCED 5 to 6	:	57.8	44.4	29.4	57.6	:	55.6	48.6	51.2	59.3	52.9	48.6	19.6 e	56.3	50.3	9.6	36.7
2000	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	HR	MK	TR	IS	LI	NO
ISCED 1	95.5	99.4	:	96.6	:	93.8	94.5	:	99.7	99.4	100	85.9	92.1	:	98.9	:	99.7
ISCED 2 to 3	:	91.1 e	:	90.4 e	83.9 e	76.3	91.4	:	95	95.6	94.4	82.1	80.8 e	:	83.3	:	94.9 e
ISCED 5 to 6	21.4	52.1	55.8	49.7	48.2	24	55.7	28.7	82.8	67.2	58.1	30.8	22.6	23.2 e	45.5	:	69.3
2005	EU27	BE	BG	CZ	DK	DE	EE	IE	GR	ES	FR	IT	CY	LV	LT	LU	HU
ISCED 1	:	97.6	92.9	92.5	95.8	:	94.7	94.6	99.6	99.6	98.6	98.6	99.3 e	90.1 e	88	96.7	88.8
ISCED 2 to 3	:	96.7	89.1	:	91.2	:	90.8	86.7	91.1	93.9	99	92.5	94.1 e	:	94.2	83.3	89.9
ISCED 5 to 6	:	62.4	43.7	47.8	80.8	:	66	58.2	90.4	66.2	56.1	65.3	33.2 e	74.9	76.5	:	65.3
2005	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	HR	MK	TR	IS	LI	NO
ISCED 1	86.3	97.9	96.9 e	96.7	98	91.3	95.7	86.2 e	98.5	97.1	98.7	:	91.8	90.2	98.1	:	98
ISCED 2 to 3	84.8	86.6	:	92.9	81.6	80.8	91	92 e	95.3	99.3	95.3	:	81.3	66 e	88.7	:	95.8
ISCED 5 to 6	31.5	59	48.9	64.1	55.1	45.2	79.5	40.7	91.9	81.6	59.4	:	29.8	31	70.4	:	78.5

Data source: UNESCO Institute for Statistics (UOE data collection)

(:) Missing or not available, (d) See definitions, (e) Estimated data, (i) See information notes

(i) Net enrolment rates (NER) are presented for the pre-primary (ISCED 0), primary (ISCED 1) and secondary (ISCED 2 and 3) levels whereas for the tertiary level (ISCED 5 and 6) the gross enrolment ratio (GER) is shown in the table. For details see the definitions below.

(d) The Gross Enrolment Ratio (GER) is the number of pupils enrolled in a given level of education, regardless of age, expressed as a percentage of the population in the theoretical age group for the same level of education. For the tertiary level, the population used is the five-year age group following on from the secondary school leaving age. The Net Enrolment Rate (NER) is the number of pupils of the theoretical school-age group for a given level of education, expressed as a percentage of the total population in that age-group. When the NER is compared with the GER the difference between the two ratios highlights the incidence of under-aged and over-aged enrolment.

**Table A.4: Participation in lifelong learning for European countries (d)**  
*A composite index on participation in lifelong learning for 4-to-64 year olds (i)*

2000	EU27	BE	BG	CZ	DK	DE	EE	IE	GR	ES	FR	IT	CY	LV	LT	LU	HU
ECE	82.8	99.2 i	67	81	90.6	81.4	78.2	51.1 i	53.9	99	100	100	55.7	60.6	51	94.9	89.5
EDU	57	62.7	48.7	51.6	56.9	60.3	61.4	62.4	52.3	55.8	61	52	51.9	57.2	59.6	49.3	52.7
LLL	7.1 e	6.2	:	:	19.4	5.2	6.5	:	1	4.1	2.8	4.8	3.1	:	2.8	4.8	2.9
<b>Index</b>	<b>62.5</b>	<b>69.9</b>	<b>47.5</b>	<b>57.0</b>	<b>77.3</b>	<b>61.8</b>	<b>62.5</b>	<b>54.8</b>	<b>44.5</b>	<b>64.3</b>	<b>65.9</b>	<b>63.5</b>	<b>47.0</b>	<b>54.1</b>	<b>48.8</b>	<b>60.5</b>	<b>58.4</b>
2000	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	HR	MK	TR	IS	LI	NO
ECE	100	99.5	79.5	33	72.3	60.3	67.7	:	41.9	72.8	100	:	12.4	:	90.9	:	78.1
EDU	55.8	60.7	55.5	59.2	56.9	48.4	56.3	:	64.2	62.8	64.7	:	47.9	:	64.2	:	62.7
LLL	4.5	15.5	8.3	:	3.4	0.9	:	:	17.5	21.6	20.5	:	:	1	23.5	:	13.3
<b>Index</b>	<b>65.1</b>	<b>78.3</b>	<b>61.9</b>	<b>44.3</b>	<b>55.3</b>	<b>44.6</b>	<b>57.2</b>	<b>56.6</b>	<b>62.8</b>	<b>76.5</b>	<b>85.4</b>	<b>40.8</b>	<b>28.5</b>	<b>21.5</b>	<b>85.1</b>	:	<b>69.9</b>
2005	EU27	BE	BG	CZ	DK	DE	EE	IE	GR	ES	FR	IT	CY	LV	LT	LU	HU
ECE	85.6	100 i	73.2	91.4	93.5	84.6	84.2	45.4 i	57.8	99.3	100	100	61.4	72.2	56.8	95.4	90.7
EDU	60.1	65.6	50.2	54.8	63.6	62	60.6	62.9	58.9	54.1	61.3	56.7	52.3	59.7	65	52	57
LLL	9.7	8.3	1.3	5.6	27.4	7.7	5.9	7.4	1.9	10.5	7.1	5.8	5.9	7.9	6	8.5	3.9
<b>Index</b>	<b>67.6</b>	<b>73.6</b>	<b>50.2</b>	<b>62.8</b>	<b>89.6</b>	<b>66.1</b>	<b>63.5</b>	<b>53.2</b>	<b>49.9</b>	<b>70</b>	<b>70.3</b>	<b>66.8</b>	<b>51.9</b>	<b>61.1</b>	<b>56.6</b>	<b>66.0</b>	<b>61.9</b>
2005	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	HR	MK	TR	IS	LI	NO
ECE	94.4	73.4	82.5	38.1	84	76.2	75.9	74	46.7	88.9	91.8	44.7	15.4	5	95.3	50.6	88.9
EDU	55.9	63.1	56.9	60.7	55.9	50.1	62.3	53.5	66.4	66	67.5	51.2	48.2	44.5	68.3	:	65.8
LLL	5.3	15.9	12.9	4.9	4.1	1.6	15.3	4.6	22.5	33.4 e	27.5	2.1	:	1.9	25.7	:	17.8
<b>Index</b>	<b>64.0</b>	<b>71.1</b>	<b>68.1</b>	<b>47.2</b>	<b>59.4</b>	<b>51.4</b>	<b>71</b>	<b>55.4</b>	<b>70.4</b>	<b>95.2</b>	<b>91</b>	<b>42</b>	<b>29.2</b>	<b>25.3</b>	<b>90.7</b>	:	<b>79.5</b>

Source: CRELL, Data source: Eurostat (UOE data collection and Labour Force Survey)  
 (:) Missing or not available, (d) See definitions, (e) Estimated data, (i) See information notes

(d) The lifelong learning index is a proxy measure of participation in education and lifelong learning for the population aged 4 to 64. One indicator is used for each stages of lifelong learning: the Early Childhood Education (ECE) measures the participation of 4-years old in education at ISCED levels 0 and 1, EDU shows the participation in primary, secondary and tertiary education of population aged 5 to 29 and LLL is the EU benchmark on participation in lifelong learning (i.e. the persons aged 25 to 64 who stated that they received education or training in the four weeks preceding the Labour Force Survey as percentage of population aged 25-64). Each those 3 components are assigned equal weight in the overall index in accordance with the principle of considering each stage of lifelong learning participation as being of equal importance.

(i) Country notes are available in tables A.2, A.3 and A.4. Imputations are used for missing data.

**Table A.5: Participation in continuing vocational training in EU countries, 1999-2005**  
*Participants in continuing vocational training courses as percentage of employees in all enterprises (d)*

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

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

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

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

## ANNEX 2 – Applications of a multi-modelling approach used for the assessment of Indices and Composite Indicators

**Table A. 6: Examples of composite indicators that were assessed using a multi-modelling approach**

Source	Composite Indicator	Brief description
Saisana & D'Hombres (2008)	<b><i>TIMES Higher Educations Ranking</i></b> (developers: TIMES) <a href="http://www.timeshighereducation.co.uk/">http://www.timeshighereducation.co.uk/</a>  <b><i>Shanghai Higher Educations Rankings</i></b> (developers: Center for World-Class Universities, Shanghai Jiao Tong University) <a href="http://www.arwu.org/">http://www.arwu.org/</a>	The main goals of this JRC report are to throw a considerable amount of light on the methodological issues and eventual limitations of the two Higher Education rankings; to assess the robustness of the two higher education ranking systems with a view to identify for which universities these ranking can be reliably used to draw conclusions and to propose, if possible and despite the known limitations of the currently available indicators in the two frameworks, an approach that combines these pieces of information in the least biased way.
Saisana (2008)	<b><i>Composite Learning Index</i></b> (developers: Canadian Council on Learning, Ottawa, Canada) <a href="http://www.ccl-cca.ca/CCL/Reports/CLI/">http://www.ccl-cca.ca/CCL/Reports/CLI/</a>	The Index puts lifelong learning on a map by measuring how well Canadians are doing across the full spectrum of learning (school, home, workplace, community). It is the first national learning index in the world.
Saisana & Munda (2008)	<b><i>Knowledge Economy Index</i></b> (developers: FP6 KEI project) <a href="http://kei.publicstatistics.net/">http://kei.publicstatistics.net/</a>	Development of a robust composite indicator that captures the multi-dimensional nature of knowledge economy in Europe.
Saisana & Saltelli (2008; 2006)	<b><i>Environmental Performance Index</i></b> (developers: Yale university and Columbia university) <a href="http://epi.yale.edu/Home">http://epi.yale.edu/Home</a>	The Environmental Performance Index aims at capturing current national pollution control and natural resource management results in more than 130 countries by identifying specific targets and measuring how close each country comes to these established goals.
Brand <i>et al.</i> (2007)	<b><i>Alcohol Policy Index</i></b> (developers: New York Medical College, Valhalla)	The index aims to assist public health leaders and policymakers to gauge the strength of a country's alcohol control policies.
Hoskins <i>et al.</i> (2006)	<b><i>Active Citizenship Index</i></b> (developers: Centre for Research on Lifelong Learning, JRC) <a href="http://crell.jrc.ec.europa.eu/">http://crell.jrc.ec.europa.eu/</a>	The Active Citizenship Index attempts to put the spotlight on the Lisbon Strategy and measure values, representative democracy and civil society using as basis the 2002 European Social Survey data.
Cherchye <i>et al.</i> (2008) Saisana <i>et al.</i> (2005)	<b><i>Technology Achievement Index</i></b> (developers: United Nations)	The study aimed at discussing how the combined use of data envelopment analysis and uncertainty & sensitivity analysis can provide useful tools in the construction of composite indicators using the Technology Achievement Index as an illustration.
Munda & Saisana (2008)	<b><i>Sustainable Development in Spanish Regions</i></b> (funded by: Autonomous University of Barcelona- Economics and Economic History, Spain)	The goal of the study was to develop and validate a regional sustainability ranking system in Spain using multi-criteria analysis and sensitivity analysis (plurality of scenarios and assessment of their impact on the final outcome).
Saisana <i>et al.</i> (2005) Munda <i>et al.</i> (2008)	<b><i>Environmental Sustainability Index</i></b> (developers: Yale University and Columbia University)	The index aimed at benchmarking the ability of more than 130 nations to protect the environment over the next several decades by integrating data that track natural resource endowments, past and present pollution levels, environmental management efforts, and a society's capacity to improve its environmental performance.



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**Abstract**

Statistics and indicators already form an essential part of existing initiatives in the field of lifelong learning with a view to monitoring progress both in achieving identified targets and in implementing policy objectives. Indicators do not tell the full story but they help to identify differences, similarities and trends and to provide a starting point for further analysis in order to understand better performance and progress.

This publication analyses participation patterns in lifelong learning in the European countries. It describes the European political context in the field of lifelong learning and discusses the main monitoring issues at the EU level by looking at the EU benchmark set up in this area. Indicators on participation in education and training at various life-time stages are as well presented and analysed in the publication. A composite measure of the overall participation in lifelong learning for European countries is constructed and analysed in the publication.

The lifelong learning index shows some progress in the European Union as a whole, mainly due to progress in pre-school and school/higher education participation. But it is too slow to reach the benchmark by 2010 unless major progress is achieved in participation in adult learning, where equity needs to be more fully addressed. In particular, some new Member states will have to increase their participation rates substantially, in order to catch up with the European average.

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