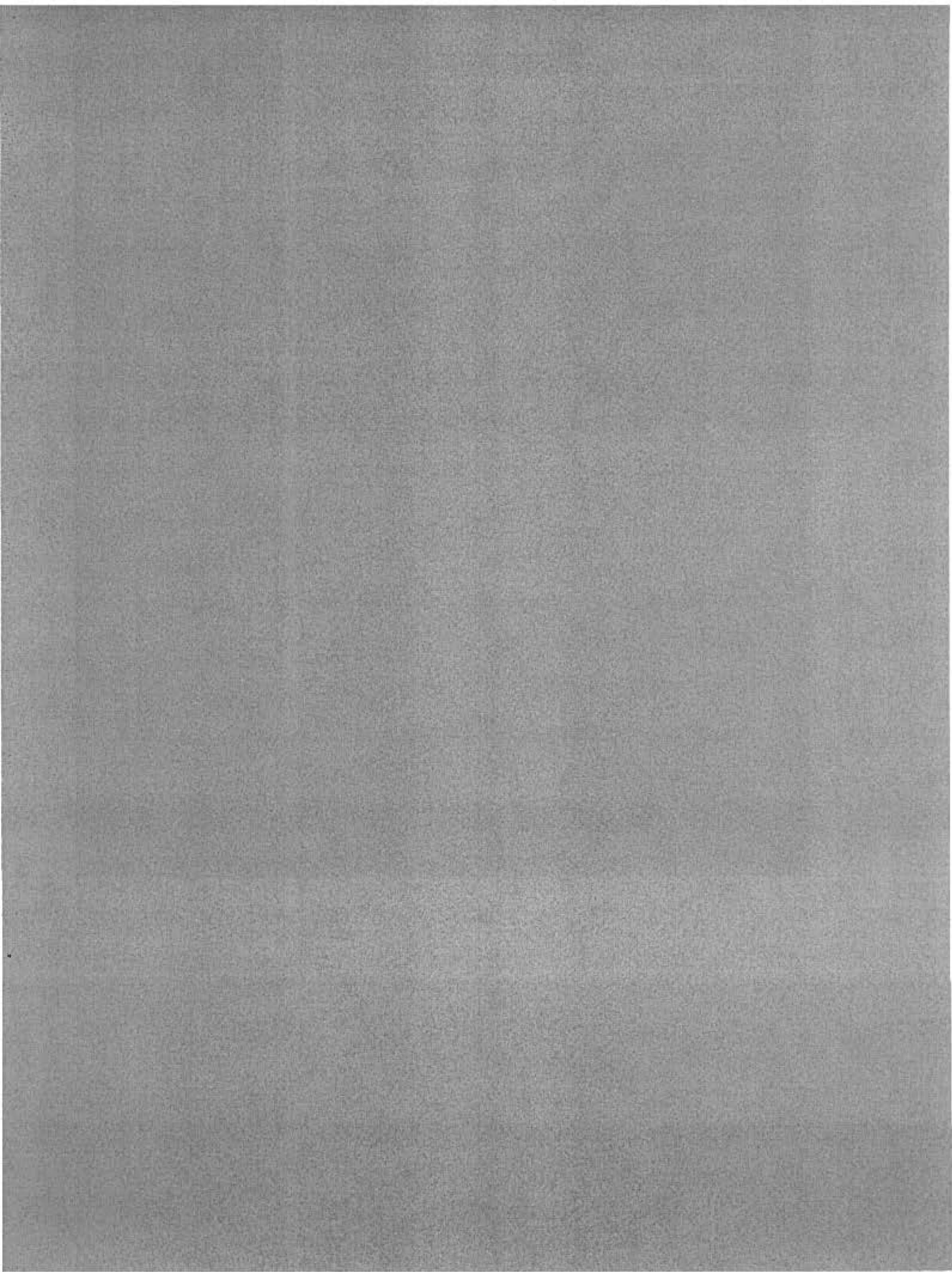


# **Can we compare post-16 performance with the 'best in the world': an empirical assessment**

learning  
& skills  
research  
centre

The Learning and Skills Council has the aspiration to make our vocational education and training system the best in the world. This report explores what that might mean in practice. Which countries are the best in the world, and how do their achievements match ours.



**Can we compare post-16 performance with the  
'best in the world': an empirical assessment**

**Frontier Economics**

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## Executive summary

### Introduction

Frontier Economics was commissioned by the Learning and Skills Development Agency (LSDA) on behalf of the Learning and Skills Council (LSC) to explore the extent to which it is possible to compare England's performance at post-16 level to the best performing countries in the world in knowledge and skills. The LSC has as its vision the aspiration that 'by 2010, young people and adults in England have the knowledge and skills matching the best in the world'. This study considers the following questions:

- Who is the 'best in the world' in knowledge and skills?
- What indicators reflect the 'best in the world' in generating knowledge and skills?
- To what extent is it possible to measure the 'best in the world' in generating knowledge and skills?
- How well does England's post-16 education sector perform compared to the 'best in the world' in generating knowledge and skills?

The report provides a description of the evidence that we have drawn on to answer these questions and the conclusions that we have reached. Headline findings for the study include the following:

We have selected 13 countries that are appropriate comparators to the UK. We have defined 19 indicators that reflect participation, retention and attainment, all of which contribute to post-16 performance in the learning and skills sector. We have identified a number of data sources that provide useful information on England's performance in generating knowledge and skills, although we have found it difficult to construct all 19 of the indicators for all of the countries. We found that England lies behind both Australia and Denmark on many of the measures that we constructed, although it is very difficult to identify a single country that is the 'best in the world' on the basis of the participation and attainment indicators.

### Defining who is the 'best in the world' in knowledge and skills

We define the set of countries that are the 'best in the world' as those that rank highly on indicators reflecting not only qualifications (expressed in terms of the International Standard Classification of Education definitions), but also knowledge and skills and productivity. On the basis of these indicators, we selected the following countries: Australia, Finland, Ireland, Canada, Norway, New Zealand, Japan, Belgium, the United States, Denmark, Germany, the Netherlands and France.

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### **Indicators reflecting the 'best in the world' in generating knowledge and skills**

Having identified which countries are the 'best in the world' in knowledge and skills, we need to select a useful set of indicators for comparison across countries, to show how England compares in generating knowledge and skills. We have developed a notion of the 'value chain' for the generation of knowledge and skills. The critical components of the value chain that the LSC can influence are:

- participation – encouraging people to enrol on programmes
- retention – ensuring that those who enrol also stay on the programme until they complete it
- attainment – attainment of qualifications acts as a signifier of the programmes people have completed.

We have developed 19 measures that make these three indicators operational. It is these measures that we want to compare between countries, so we can develop a view on how England has performed in generating knowledge and skills.

---

### **Measuring the 'best in the world' in generating knowledge and skills**

To assess the extent to which England matches the 'best in the world' we need to obtain data for the different countries. Ideally we would like the data to:

- be publicly available for the set of countries considered to be the 'best in the world'
- cover the following elements: participation, retention and attainment
- feature enough detail to enable comparisons to be made across different qualifications.

We reviewed two types of data in detail to see if they met these requirements: (i) national Labour Force Surveys and Censuses and (ii) administrative-level data obtained from institutions providing post-16 education for the set of comparator countries. We found that, in addition to England, there are relatively few countries (Australia, Canada, Denmark and the United States) for which robust data is available that fits these requirements.



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### **To what extent does England match the 'best in the world' in generating knowledge and skills**

We constructed a series of indicators reflecting participation, retention and attainment for Australia, Canada, Denmark, the United States and England, drawing on a combination of administrative data sources and national Labour Force Surveys and Censuses. Our analysis revealed the following:

- No single country appears to be the 'best in the world' on the basis of all our measures.
- England lies behind both Australia and Denmark in terms of the proportion of the population of working age currently enrolled on programmes leading to Level 2, Level 3 or Level 4 and higher qualifications.
- Australia and Denmark rank highly in terms of the proportion of the population of working age whose highest qualification is at Level 2 or Level 3. England ranks behind both those countries at Level 2 and also behind Canada at Level 3.
- It is very difficult to construct indicators reflecting retention that are comparable across the countries that we considered.

---

### **Implications of the research**

Looking ahead for the LSDA and the LSC, although it may be possible to construct a robust set of indicators that reflects England's performance in post-16 knowledge and skills relative to the best in the world, a large amount of investment would be required to overcome the problems described in this report. The LSDA/LSC may wish to consider whether the cost of this investment is outweighed by the benefit.



**Section 1****Introduction****1.1****Background**

The Learning and Skills Council (LSC) has a vision that by 2010, young people and adults in England will have the knowledge and productive skills to match the 'best in the world'. The Learning and Skills Development Agency (LSDA) has commissioned Frontier Economics (Frontier) on behalf of the LSC to assess the extent to which it is possible for the LSC to compare its performance at post-16 level to the best performing countries in knowledge and productive skills.

The approach we have taken to address the objective has been to provide an evidence base that addresses the following questions:

- Who is the 'best in the world' in knowledge and skills?
- What indicators reflect the 'best in the world' in generating knowledge and skills?
- To what extent is it possible to measure the 'best in the world' in generating knowledge and skills?
- How well does England's post-16 education sector perform compared to the 'best in the world' in generating knowledge and skills?

The study finds that there is a range of information across a number of countries on post-16 participation, retention and attainment that is both useful and illuminating. However, there are substantial measurement issues that make comparisons between England and other countries problematic. The issues relate to the fact that in many cases we are comparing different systems with different qualifications. There are also issues with the data that is readily available. The data tends to cover different time periods, different cohorts and different age groups. It follows that carrying out a rigorous benchmarking analysis across a wide range of countries is too difficult. However, viewing the data from the range of different sources in a pragmatic way sheds some light on England's performance.

**1.2****Structure of the report**

The remainder of the report is structured in the following way:

Section 2 defines what it means to be the 'best in the world' in the context of the post-16 learning and skills sector and how it might be measured.

Section 3 reviews previous international benchmarking studies that focus on quantitative assessments of educational performance in different countries.

Section 4 describes our approach to allocating qualifications to English NQF levels, which the LSC's policy targets are based on.

Section 5 discusses the data sources that we use for the study.

Section 6 presents the indicators for each country and draws together the analysis comparing indicators internationally.

Section 7 presents our conclusions.



## Section 2

## Defining the 'best in the world'

The objective of this study is to assess how England compares to the 'best in the world' in generating knowledge and skills. In meeting this objective, we need to identify those countries that are the 'best in the world' and assess how the LSC performs relative to those countries in assisting people to acquire knowledge and skills. An understanding of who is the 'best in the world' in generating knowledge and skills has a number of aspects to it. For example:

- How do we select the best countries in the world?
- What specific aspects of performance in the post-16 learning sector do we wish to compare across countries?
- How do we define a workable set of indicators for the benchmarking study?

---

### 2.1

#### How do we select the best countries in the world in knowledge and skills

A good starting point for selecting countries that perform well in knowledge and productive skills is to look at the proportion of the workforce that has attained different levels of qualifications. Although this measure is a good indicator that a country performs well, acquisition of qualifications is not necessarily an objective in itself. For example, the government in the UK is interested in achieving a high level of productive skills<sup>1</sup> in the economy, as there is substantial quantitative evidence demonstrating a link between skill levels within the workforce and economic growth.

This would suggest that, for the purposes of this study, when selecting comparator countries, it would be desirable not only to consider those countries that perform well in terms of qualification attainment levels, but to also look more widely at countries' productivity levels and indicators of knowledge and skills.<sup>2</sup>

We undertook this type of analysis in an earlier study commissioned by the LSDA<sup>3</sup> using recent data from the Organisation for Economic Cooperation and Development (OECD) and the International Adult Literacy Survey (IALS). Specifically, we calculated the following indicators for major OECD countries:

- productivity
- gross domestic product (GDP) per hour worked
- growth of labour productivity as measured in GDP per hour worked
- growth of GDP per head
- knowledge and skills
- average literacy scores based on IALS data
- test scores on the reading literacy, mathematic literacy and science literacy scales of the OECD Programme for International Student Assessment (PISA), based on 15 year-olds' performance in a series of standardised tests

1 See DfES '21st Century Skills, Realising Our Potential' July 2003 and HM Treasury 'Pre-Budget report: 3 Meeting the Productivity Challenge' 2003.

2 See for example, Barro, Robert J 'Economic Growth in a cross section of countries'. The Quarterly Journal of Economics, Vol 106, No 2 (May 1991), pp 407-443.

3 See 'Matching the best in the world in knowledge and productive skills', July 2004.

- qualifications
- percentage of 25–64 year-olds with education lower than upper secondary level
- growth in upper secondary education over the past ten years.

A weighted analysis of these indicators revealed that the following 13 countries performed consistently well and therefore could be regarded as the ‘best in the world’ in knowledge and skills: Australia, Finland, Ireland, Canada, Norway, New Zealand, Japan, Belgium, US, France, Germany, Denmark and Canada.

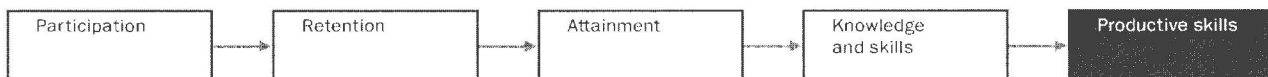
## 2.2 What dimensions are we interested in?

Having identified those countries that we wish to compare England to, the next question we need to consider concerns the particular aspects of post-16 performance in the learning and skills sector that we should concentrate on. There are a number of elements that appear appropriate for comparing the LSC’s performance relative to its counterparts in the best-performing countries. These are:

- participation – encouraging people to enrol on programmes
- retention – ensuring that those who enrol also stay on the programme until they complete it
- attainment – attainment of qualifications act as a signifier of the programmes people have completed.

These components might be considered in terms of a ‘value chain’ of learning and skills provision, as shown in Figure 1.

**Figure 1**  
The value chain of learning and skills provision



The extent to which the LSC has influence over each of these components may vary. For example, while the LSC can have an impact on participation and retention rates to a relatively high degree, its influence on attainment will depend on a number of external factors. Despite this, it is useful to think about constructing indicators reflecting participation, retention and attainment that contribute to enhancing productive skills within the workforce.

## 2.3

### What do we actually measure?

The next step in defining what it means to be the 'best in the world' is to consider the specific list of indicators for which we would like to gather data within the categories of participation, retention, and attainment.

We express the indicators in terms of National Qualifications Framework (NQF) levels, given that the LSC is interested in its performance relative to its policy targets, and also that there is a need to express qualifications from different countries in a way that is comparable across countries. In addition, we are particularly interested in indicators that focus on Levels 2 and 3, given that the LSC has responsibilities that lie within the post-16 learning and skills sector.

We defined a relatively long list of indicators; the more indicators we have, the greater the possibility of obtaining data for all countries for at least some of them. The specific age groups referred to are consistent with those mentioned in the LSC's policy targets.

More generally, the indicators we have defined represent the ideal set of indicators we would like to construct in the absence of any data constraints. In practice, we realise that it will be unlikely that we will be able to compile all these indicators, and that the eventual set of indicators we use will reflect the data available.

### Participation indicators

These indicators measure the number of people currently enrolled on different programmes within a given year. Depending on the length of the programme, the indicators will reflect people who might be midway through a programme longer than a year, in addition to people who have enrolled on a programme during the course of a year. Participation indicators are particularly interesting from a policy perspective, as the LSC has scope to influence the number of people enrolling on programmes.

**Table 1**  
Participation indicators

Participation indicators	Description
P1: 15–24 Level 3	Number of people aged 15 to 24 enrolled on a full-time programme leading to a Level 3 qualification/total number of people aged 15–24
P2: All adults higher than Level 3	Number of adults of working age enrolled on a programme leading to a qualification higher than Level 3/ total number of adults of working age
P3: All adults Level 3	Number of adults of working age enrolled on a programme leading to a Level 3 qualification/total number of adults of working age
P4: All adults Level 2	Number of adults of working age enrolled on a programme leading to a Level 2 qualification/total number of adults of working age
P5: All adults lower than Level 2	Number of adults of working age enrolled on an Entry or Level 1 programme/total number of adults of working age

## Retention indicators

The retention indicators reflect the proportion of people of working age who have enrolled on a programme who also complete it, irrespective of whether they obtain a qualification or not.

**Table 2**  
Retention Indicators

Retention indicators	Description
R1: All adults lower than Level 2	Number of adults of working age completing Entry level or Level 1 programmes/total number of adults enrolled on Entry level or Level 1 programmes
R2: All adults Level 2	Number of adults of working age completing a Level 2 programme/total number adults enrolled on Level 2 programmes
R3: All adults Level 3	Number of adults of working age completing a Level 3 programme/total number of adults enrolled on Level 3 programmes
R4: All adults higher than Level 3	Number of adults of working age completing a higher than Level 3 programme/total number of adults enrolled on higher than Level 3 programmes

The retention indicators are also of interest to the LSC because, in addition to encouraging participation, retaining people on the courses that they start on is also important in increasing skills levels within the workforce.

## Attainment indicators

We look at two types of attainment indicators, depending on the specific data available for each country.

### Attainment indicators – flow

Indicators based on data reflecting the qualifications attained by people within one year measure the flow of people obtaining a qualification as a proportion of the number of people enrolled on specific programmes. These attainment indicators are of particular interest to the LSC, because over a period of time they will provide some information on the success of current policies.

### Attainment indicators – stock

These indicators reflect the proportion of the working population or particular age groups that hold qualifications at different levels, irrespective of when they attained them. Although looking at the stock of qualifications at a point in time is interesting from the perspective of cross-country comparisons, from the perspective of the LSC it is the changes in the stock of qualifications that are more illuminating, since this provides an indication of the potential impact of the LSC's activities on attainment.

In this section, we have identified those countries that are potential comparators to England, and we have also identified a set of indicators based on participation, retention and attainment. Now we have developed this conceptual framework, we need to understand what research is available that can inform England's relative performance in knowledge and skills.



**Table 3**  
Attainment indicators  
(flow)

<b>Attainment indicators (flow)</b>	<b>Description</b>
A1: All adults lower than Level 2	Number of adults of working age completing an Entry level or Level 1 qualification/total number of adults enrolled on Entry level or Level 1 programmes
A2: All adults Level 2	Number of adults of working age completing a Level 2 qualification/total number of adults enrolled on Level 2 programmes
A3: All adults Level 3	Number of adults of working age completing a Level 3 qualification/total number of adults enrolled on Level 3 programmes
A4: All adults higher than Level 3	Number of adults of working age completing a qualification higher than Level 3/total number of adults enrolled on higher than Level 3 programme
A5: 19 year-olds Level 3	Number of 19 year-olds completing a Level 3 qualification/total number of 19 year-olds enrolled on Level 3 programmes

**Table 4**  
Attainment indicators

<b>Attainment indicators</b>	<b>Description</b>
A6: Age 15–24 with Level 3	Number of people between the ages of 15 to 24 who have a Level 3 qualification/total number of people aged between 15 and 24
A7: All adults lower than Level 2	Number of adults of working age with an Entry level or Level 1 qualification/total number of adults of working age
A8: All adults Level 2	Number of adults of working age with a Level 2 qualification/ total number of adults of working age
A9: All adults Level 3	Number of adults of working age with a Level 3 qualification/ total number of adults of working age
A10: All adults higher than Level 3	Number of adults of working age with a higher than Level 3 qualification/total number of adults of working age



**Section 3****Assessment of the evidence base**

In this section we review existing recent quantitative studies that have attempted to benchmark the performance of the UK's education system compared to a number of other countries. In particular, we review these studies with a view to identifying:

- the countries that have been looked at
- the indicators that have been used for international comparisons
- the data sources that have been used
- the relevance of the study to the LSC.

We then draw on this information to clarify the countries that we propose to use as comparators in this study and the data sources that we will evaluate in detail.

**3.1****Education at a glance, 2004<sup>4</sup>**

The annual OECD publication 'Education at a Glance: OECD Indicators' provides a comparable up-to-date array of indicators on the performance of education systems.

**Countries covered**

It draws together information for all OECD countries, allowing countries to compare themselves to other countries. Published on an annual basis, different editions of Education at a Glance focus on different issues. The 2004 edition concentrates on quality of learning outcomes, the policy levers and contextual outcomes that shape these outcomes, and the broader private and social returns that accrue from investment in education.

**Indicators covered**

The report includes information on a wide range of indicators, including those relating to participation and attainment from early childhood through to tertiary education. Specifically, the indicators that are of interest to the LSC include:

- educational attainment of the adult population
- current upper-secondary graduation rates and educational attainment of the adult population
- school expectancy and enrolment rates
- entry into and expected years in tertiary education and participation in secondary education.

In addition to publishing indicators of participation and attainment in post-16 programmes for OECD countries, the study also contains information on spending patterns, information for countries beyond the OECD, and factors that influence wider learning outcomes.

<sup>4</sup> Education at a Glance: OECD Indicators, OECD, 2004.

### **Data sources**

The data sources used to compile the indicators relevant to the OECD are mainly from the OECD and EUROSTAT databases which are compiled from the national Labour Force Surveys. In addition, some data is also taken from the OECD Programme for International Student Assessment (PISA) study.

### **Relevance to the LSC**

The main drawbacks of the OECD comparative study are twofold. First, the indicators based on qualifications are expressed in terms of the International Classification of Education Systems (ISCED), which are not detailed enough to reflect the LSC's policy targets. Second, the report includes limited information on retention and knowledge and skills which is not reported in a way that is consistent with the desired list of indicators described in Section 2.3.

5 International Comparisons of Qualifications: Skills Audit Update, by Hilary Steedman, Steve McIntosh and Andy Green

## **3.2 Steedman *et al.*, 2004<sup>5</sup>**

This study, commissioned by the Department of Education and Skills (DfES), is the third in a series of studies aimed at informing policymakers about how stocks of qualifications in the UK in 2003 compare with other countries in the audit. The report covered the age groups 19–21, 25–28, the active part of the labour force aged 16–64 and total population aged 16–64.

### **Countries covered**

France, Germany, the US and Singapore were chosen as the comparator countries.

### **Data sources**

The data source for the study is the national Labour Force Surveys.

### **Indicators covered**

The focus of the study is on the stock of qualifications held by the workforce, and specific age groups within the workforce, at different points in time. Each category of qualifications is classified into the English NQF-levels.

## Relevance to the LSC

The study reports relevant information on the stock of qualifications held within the UK compared to other countries. Key findings include the following:

- Attainment of the UK population relative to other countries varies according to the age group being looked at. For the 19–21 age group, the UK has higher proportions attaining Level 2 and above and Level 3 and above than either Germany or the US. France and Singapore performed best at Level 2 and above and Level 3 and above respectively. In contrast, when looking at the 25–28 age group, the UK performs less well than Germany and the US both at Level 2 and above and at Level 3 and above. The paper suggests that the lag in the UK's performance for 25–28 year-olds at Level 3 and above may be because other countries have longer study periods before they achieve a Level 3 qualification.
- Vocational qualifications in the UK constitute a much lower proportion of total qualifications than, say, in France and Germany.
- In terms of growth rates between 1994–2003, the UK had the highest growth rate in Level 2 and above while Singapore and France were able to match the growth of the UK in Level 3 and above. This implies that the UK is catching up with other countries in Level 2 and above but is just able to keep up in Level 3 and above.

A particular strength of this study is that it published indicators expressed in terms of NQF levels that are directly relevant to the LSC's targets. Unfortunately, the study only covers attainment, and not participation or retention. In addition, it does not cover a large sample of countries and also includes countries such as Singapore that we do not define as being the 'best in the world' in generating knowledge and skills.

---

## 3.3

### Frontier scoping study, 2004

In 2004 the LSDA commissioned Frontier to undertake a scoping study to examine the extent to which it might be possible to compare the UK's performance to that of other countries<sup>6</sup>. In summary, the study involved the construction and comparison of high-level participation and attainment indicators using UNESCO/OECD/EUROSTAT data and analysis of data on basic skills from the International Adult Literacy Survey (IALS). The study also explored the feasibility of undertaking further analysis using national labour force/census data and administrative data, such as the LSC's Individual Learner Record.

<sup>6</sup> Due to data availability, the scoping study focused on the UK rather than England.

### **Selection of countries**

As described in Section 2.1, the study included an assessment of 13 countries: Australia, Finland, Ireland, Canada, Norway, New Zealand, Japan, Belgium, US, France, Germany, Denmark and Canada.

### **Indicators**

Using the UNESCO/OECD/EUROSTAT data and the IALS data, the study looked at the following indicators:

- participation
  - the participation of 15–19 year-olds in any education
  - the participation of 15–19 year-olds in upper secondary education
- attainment
  - the attainment of 20–24 year-olds at the upper secondary level
  - the attainment of 15–19 year-olds at lower secondary level
  - the attainment of adults (15–64) at lower secondary level
- knowledge and skills
  - the skills of adults in document literacy, prose literacy and numeracy, as measured by IALS.

### **Data sources**

In addition to analysing UNESCO/OECD/EUROSTAT data, in the scoping report we also assessed the feasibility of using national Labour Force Surveys/Censuses and administrative data sources for further analysis for the 13 countries mentioned in 3.3. Specifically, these data sources were examined in terms of the information that they contained on participation, retention, attainment and knowledge and skills. The study reported that Labour Force Survey/Census data was available for nine countries, and that administrative data was also available for nine countries.

### **Relevance to the LSC**

Although the study provides useful information on participation, attainment and knowledge and skills, the indicators reported do not reflect the NQF levels, nor do they tie in with the ideal set of indicators identified in Section 2.3. However, the assessment of the suitability of using Labour Force Survey/Census data and administrative data for further analysis is very useful, since it suggests that it would be worthwhile to use these data sources to construct the indicators described in Section 2.3.

---

### 3.4

#### Review of the evidence gaps

This review of the existing literature shows that although there have been a small number of studies that compare aspects of the educational performance of the UK to that of other countries, there are, as far as we are aware, no studies that:

- examine all the elements of the value chain which work together to ensure that people in the workforce have productive skills
- include indicators that are consistent with and reflective of the targets measuring the LSC's progress towards matching the 'best in the world'
- focus exclusively on England rather than the UK.

In light of these evidence gaps, this study aims to use the best data available to benchmark England's performance in the post-16 sector. A key issue we need to consider when assessing England's performance relative to that of other countries is the comparison of different qualifications obtained in different countries. We turn to this issue in the next section.





**Section 4****Comparing qualifications across countries**

A key issue in comparing qualifications across countries is the ability to compare like with like. Robust international benchmarks can only be constructed if we are comparing qualifications obtained in one country with similar qualifications in different countries.

Unfortunately, comparing different qualifications across countries is far from straightforward. Education systems and qualifications differ in a number of respects. For example, the duration of compulsory schooling differs across countries, as does the range of academic and vocational programmes available across, and even within, countries.

In light of these difficulties, in this section we explain how we have attempted to match qualifications in different countries using a combination of qualitative and quantitative analysis.

---

**4.1****National Qualifications Framework**

Given that the LSC's policy targets are expressed in terms of NQF levels, it is informative for policy purposes to allocate qualifications in the benchmark countries to the following categories:

- lower than NQF Level 2
- NQF Level 2
- NQF Level 3
- higher than NQF Level 3.

---

**4.2****Methodology**

An initial task involved using qualitative contextual information on national education systems and the content of courses to establish an approximate equivalence with English qualifications. In particular, we gathered information on the following:

- the countries' range of academic and vocational programmes available in the post-16 learning and skills sector
- the duration of different programmes
- the approximate standard of the qualifications attained within the programmes compared to English equivalents.

In addition, we have consulted experts from relevant countries who are members of the OECD International Indicators on Education Systems Technical Working Group (See Appendix 1 for a list of the people we have spoken to) to gather additional information on the extent to which different countries' qualifications are equivalent to those available in England.

---

### 4.3 Results

Table 5 shows our comparison of different countries' post-16 qualifications with those in England. The first column of the table shows the NQF levels. The second column then matches English qualifications to the NQF levels.<sup>7</sup> The remaining columns show our initial attempts to match qualifications in the four high-performing countries to the NQF levels. For example, in Australia, the Senior Certificate of Education, like English A-levels, is taken at the end of upper secondary education and is an entry qualification into higher education; it can therefore be classified as Level 3 under the NQF.

In undertaking this analysis we recognise that it is very difficult to assign one-to-one mapping across individual qualifications over different countries. In practice some qualifications cover a wide range of abilities, while other qualifications taken at the same age but in a different country might indicate a much more limited ability range. Therefore, we have allocated some qualifications to more than one level, with the percentage of people attaining the qualification at each level shown in brackets.

For example, in the case of the US, an analysis of the standards attained by students achieving a high school diploma suggests that these are much more wide ranging than those achieved by students achieving one or more A-level. In the light of this, we have taken the view that 50% of students with a High School Diploma receive a qualification equivalent to NQF Level 3 and the other 50% receive a qualification equivalent to NQF Level 2.<sup>8</sup> We adopted a similar approach to allocating the numbers enrolled on/attaining a high school diploma between Level 2 and Level 3 in Canada.

In the case of Denmark, we estimated that the vocational programme 'Erhvervsfaglige Uddannelser' comprised 75% Level 3 qualifications and 25% Level 2 qualifications. These estimates were derived from a time series analysis of the split between equivalent Level 2 and Level 3 vocational programmes 'Erhvervsfaglige hovedforløb' and 'Erhvervsfaglige grundforløb'.

<sup>7</sup> See the QCA website ([www.qca.org.uk](http://www.qca.org.uk)) for the complete list and definition of the different levels and also Steedman *et al.* (DfES, 2004) for a description of the approach to matching qualifications to levels.

<sup>8</sup> This is based on analysis discussed in Steedman *et al.* (DfES, 2004).

NQF levels	England	Australia	Denmark	Canada	US
3	One or more A-levels/two or more AS levels	Senior certificate of secondary education	Studentereksamen, HF, HHX, HTX, Entrance exam for engineer diploma Maritime preparation course	High School Diploma (50%)	High School Diploma (50%), Advanced Placement 12th Grade
	Modern Apprenticeship	New Apprenticeships	Erhvervsfaglige uddannelser (VET)	Apprenticeships	
3	AMA		(75%)		
2	FMA		(25%)		
3	BTEC ONC/OND, City & Guilds (20%), NVQ3, GNVQ advanced, RSA advanced diploma, City & Guilds advanced crafts	VET Certificate (above level II)	Erhvervsfaglige hovedforløb (mercantile and technical streams, social and health, educator assistant, further education and others)	Vocational certificate	Technical Associate Degree
2	City & Guilds Qualification (40%), NVQ2, GNVQ intermediate, RSA diploma, City & Guilds crafts	VET Certificate (levels I and II)	FUU Basic vocational courses	Vocational Diploma	
2	5 or more GCSEs (grades A*-C)	Junior Certificate	9th and 10th grade	High School Diploma (50%)	High School Diploma (50%), GED, 10th grade

**Table 5**  
Matching of qualifications to NQF levels

In this section we undertook an analysis of different countries' qualifications with the intention of allocating qualifications to NQF levels. This allows us to construct the participation, retention and attainment indicators described in Section 2.3. However, to do this we need to identify the best data sources. We look at this issue in the next section.



**Section 5****Selecting data sources**

The choice of data sources is a critical element of this study; the more robust the data used to construct the indicators, the more reliable our conclusions about the extent to which England matches the 'best in the world'. A key recommendation from our scoping study was that it would be worthwhile exploring the extent to which national Labour Force Surveys/Censuses and administrative provider/post-16 cohort surveys could be used to construct a useful set of internationally comparable indicators. Within these broad categories of data we need to be able to select the most suitable data sets that can be analysed further.

In this section we describe:

- the criteria used to select the best data sources for the study
- characteristics of the data sets considered
- our recommendations for the most suitable data sources to use for the construction of indices.

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**5.1****Assessment criteria**

Ideally we would like to use those data sets that contain:

- information on participation, retention and attainment
- academic and vocational qualifications
- enough detail to enable indicators to be expressed in terms of NQF levels.

In the following section we describe the data sources we looked at and the extent to which they met these criteria.

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**5.2****Analysis of data sources**

In this section we assess the available data sources for England, Australia, Canada, Denmark and the United States. We focus on these five countries because a review of the data available for the comparator countries revealed that it was only these countries that had data available that met the three assessment criteria.

**Analysis of administrative data sources****England**

The Individual Learner Records (ILRs) held by the LSC are detailed individual level records of all students participating in programmes funded by the LSC. We had access to the ILRs related to further education (FE) and work-based learning (WBL). The records contain information on demographic and socio-economic characteristics of all students, together with information on the programmes on which they are currently enrolled, the programmes completed and qualifications attained. This data source contains extremely detailed information on participation, retention and attainment, and qualifications are recorded in a form that can be relatively easily converted to NQF levels. The main disadvantage of the ILR is that it does not contain information on students still at school.

The Department for Education and Skills (DfES) supplied us with the *National Pupil Database (NPD)* Key Stage 5 2003 'final' data, matched to information from the Pupil Level Annual Schools Census and prior attainment at Key Stages 2–4. The NPD is a census of all pupils in England in Local Education Authority (LEA) maintained schools. It includes attainment and other pupil-level information, including participation and completion at Key Stage 5. We are not able to calculate any retention indicators using the NPD, nor does the NPD include much information on vocational qualifications, since it records only data relating to students at school.

### **Australia**

The national Vocational Education and Training (VET) provider database compiled and managed each year by the National Centre for Vocational Education Research (NCVER) is a complete, unit-record dataset covering all activity in the public VET system for each calendar year. It provides information about each student (eg age, sex, whether still at school, highest school level completed and the year, plus various other demographics), the courses/qualifications they completed or undertook and the subjects (modules or units of competency) that they undertook, together with the results (in terms of pass, fail, withdrew, continuing in the following year, etc).

The VET provider database contains information relating to participation, retention and attainment, and is sufficiently detailed to match qualifications to NQF levels. Its main drawback is that it contains only information for people in Vocational Education and Training, and therefore lacks detailed information on academic qualifications.

Schools, Australia publishes information on the number, age, sex, year/level, category of school, apparent retention rates and participation rates of students at both the state and national levels. In addition, information on school staff is published at state and national level. The data published in Schools, Australia is taken from The National Schools Statistics Collection – a census, conducted annually as a collaborative arrangement between state, territory and Commonwealth education authorities and the Australian Bureau of Statistics (ABS). Data is collected from the relevant authorities on a range of issues relating to schools, students and staff in primary and secondary schools throughout Australia, from both the government and non-government sectors. This data source is useful in terms of the information that is published on retention rates in schools.

## Canada

The Youth in Transition Survey is a longitudinal study that collects information about major transitions in young people's lives, particularly those between education, training and work. Two different age groups participated in the survey – a 15 year-old cohort (born in 1984) and an 18–20 year-old cohort (born between 1979 and 1981). The latter cohort, of interest to this study, was initially surveyed in 2000 (about their activities in 1999) and every two years thereafter. Among the issues on which information was gathered were respondents' highest level of education attained, the specific programmes on which they were/had been enrolled and the reasons for not completing any programmes. Unfortunately, the survey is limited in the age range that it covers, and much of the information recorded about qualifications is not in a form that can be easily converted to NQF levels. In addition, the survey contains limited information about vocational qualifications, again in a form not easily expressed in terms of NQF levels.

## Denmark

The INTE database, produced by Danish Statistics, contains information collected from the different institutions in the Danish education system and includes data from more than 1000 active programmes, ranging from the level of basic schooling to post-graduate doctoral level.

We examined the latest year of data available, ie 2002. The INTE database reports the number of students:

- participating on given programmes on 1st October 2001
- added to a given programme during the period 1st October 2001 to 30th September 2002
- dropping out of a particular programme over the period 1st October 2001 to 30th September 2002
- completing a given programme during the period 1st October 2001 to 30th September 2002.

The INTE database is therefore extremely comprehensive, reporting information that can be used to construct indicators relating to participation, retention and attainment (flows). The data provided is also sufficiently detailed that it is possible to allocate Danish qualifications to NQF levels, and also covers academic and vocational qualifications.

In addition to the INTE database, we examined attainment data on stocks of qualifications held provided by Statistics Denmark. Statistics Denmark reports the highest attained education of the population (15–69 years). The primary source for the data is the Integrated Student Register, which contains information drawn from the administrative registers of educational institutions.

## **The United States**

The Beginning Post-Secondary Studies (BPS) is a cohort study comprising people who first entered post-secondary education in the 1995–96 academic year. Although the cohort study includes some information on participation and attainment, use of this study to construct indicators is not particularly appropriate for a number of reasons. First, the survey is relatively dated, recording participation in post-secondary studies in the mid-1990s. Second, the sample is biased from our perspective, since it covers people who enter into post-secondary education predominately at the age of 18. It therefore tends to exclude people who have only Level 2 qualifications, or qualifications lower than Level 2.

We also examined the Common Core of Data collected by the National Center of Education Statistics. The Common Core of Data is a comprehensive, annual, national statistical database of information concerning all public elementary and secondary schools (approximately 94,000) and local education agencies (approximately 17,000; of these, about 14,500 are regular school districts that operate schools). For our purposes it includes useful information on retention rates within schools.

## **Assessment of administrative data sources**

Our analysis of selected administrative data sources suggests the following. First, we have found that there are a number of data sources that contain useful information on participation and attainment for our benchmark countries, but unfortunately much of the qualification data recorded is in a form that is not easily expressed in terms of NQF levels. Second, there is relatively little information available on retention. Third, there is no single data source for any country that could be used to construct all of our indicators.

We summarised the extent to which the administrative data sources can be used to construct the various indicators in Table 9, included in Appendix 3. The table indicates that although the administrative data sources provide much of the information needed to construct the indicators, there are still some data gaps.

In the light of these findings we suggest that it would be appropriate to gauge the relevant national Labour Force Surveys/Censuses against the criteria described in Section 5.1. Our analysis and assessment is described below.

## **Analysis of Labour Force Surveys/Censuses**

### **England**

We assessed the Labour Force Survey (LFS). This contained information on respondents' current course of study and on the qualifications that they had already attained. Qualifications were recorded in sufficient detail to enable allocation to NQF levels. The LFS did not contain any information on retention.



### **Australia**

The Australian Bureau of Statistics (ABS) Survey of Education and Work, 2004, presents information about the educational experience of people aged 15–64, especially in relation to their labour force status. Statistics in the 2004 survey were collected as a supplement to the ABS monthly Labour Force Survey.

The survey contains information on participation and attainment, and qualifications are described in a way that enables classification in terms of NQF levels. There is no information in the survey on retention.

Unfortunately the May 2004 Survey of Education and Work did not contain information on the highest level of education attained. Therefore, to calculate the attainment indicators reflecting stocks, we had to rely on data from the 2001 Survey of Education, Training and Information Technology (SETIT). This surveyed individuals about their education and training experiences, and respondents were asked in particular to identify their highest year of school completed and the level of their highest non-school qualification. The responses from these two questions were used to compile an indicator reflecting the highest level of educational attainment.

### **Canada**

The 2001 Census of Population provides information on the highest degree, certificate or diploma attained in addition to the demographic, social and economic characteristics of the entire population. Although the information available on qualifications attained is relatively detailed, it would have been desirable to have more information to enable a more robust allocation of qualifications to NQF levels.

### **Denmark**

We did not examine the Danish Labour Force Survey or the Census, as all the information that we required was available from administrative data sources.

### **The United States**

We assessed the Current Population Survey (CPS) to gauge whether it contained suitable information that could be used to construct any of the indicators. The CPS is a monthly survey of unemployment and labour force participation. In addition to labour force statistics, there are a number of CPS supplements covering a range of subjects, including schooling. We examined the October 2001 school enrolment supplement that contained information on current grade or year attended and the highest level of school completed or degree received. Although the qualifications recorded were relatively detailed, ideally more information would have been useful to permit a more robust allocation of qualifications to NQF levels.

### **Assessment of national Labour Force Surveys/Censuses**

Labour Force Surveys and Censuses provide some useful information on participation and attainment in terms of stocks. Furthermore, these data sources tend to report information on both academic qualifications (in some detail) and vocational qualifications (in less detail). Finally, although the level of detail recorded relating to qualifications is not ideal, these data sources do allow us to allocate qualifications to NQF levels, albeit approximately.

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### **5.3**

#### **Recommendations**

Our analysis of Labour Force Surveys/Censuses and administrative data sources suggests no single type of data will provide all the information that we need to construct the indicators. Therefore, we propose to use a combination of data sources in our construction of the indicators.

We report the full list of data sources used to construct each of the indicators in Tables 10–12 in Appendix 3.

## Section 6

## Country results

In this section we discuss the results from our benchmarking analysis. We consider participation, attainment and retention in turn.

## 6.1 Participation

Table 6 shows the participation indicators calculated for each of the countries. Unfortunately we were unable to obtain any participation information for Canada.

**Table 6**  
Participation indicators –  
proportion of group  
currently studying at  
different levels

Indicator (%)	Australia (2001)	Canada	Denmark (2001)	US (2001)	England (2003)
P1: 15–24 year-olds Level 3	13.76		25.21	5.24	8.13
P2: All adults Level 3 or higher	8.16		5.12	8.11	6.10
P3: All adults Level 3	3.90		5.12	1.09	3.70
P4: All adults Level 2	2.15		2.40	1.09	1.60
P5: All adults Level 1	0.01		0.19	2.96	4.90

<sup>9</sup> See Appendix 2 for a discussion relating to population data.

Looking at the percentage of 15–24<sup>9</sup> year-olds currently participating in a programme leading to Level 3 qualifications (indicator P1) we observe that Denmark ranks the highest on the basis of this indicator, followed by Australia. England ranks third in terms of the percentage of 15–24 year-olds currently enrolled on a programme leading to a Level 3 qualification, followed by the US.

In terms of participation in programmes leading to a qualification at Level 3 or higher, we observe that Australia performs the best on the basis of this indicator (P2), closely followed by the US. At the other end of the scale, Australia has hardly any people participating in programmes leading to Entry level or Level 1 qualifications. This is in contrast to England, where nearly one-in-twenty of the working population is currently enrolled on a programme leading to an Entry level or Level 1 qualification.

Our analysis of participation indicators reveals that it is difficult to identify who is the ‘best in the world’ in terms of participation. Although Australia appears to perform strongly in respect of the indicator showing the proportion of the population of working age currently enrolled on Level 4 plus programmes, Denmark has a larger share of the working population enrolled on programmes leading to qualifications at Levels 2 and 3. Nevertheless, even though it is difficult to identify a single country that is ‘world leader’, some patterns do emerge. In particular, it appears that England lags behind both Denmark and Australia in terms of the proportion of the population working towards obtaining qualifications above Level 1.

## 6.2

### Attainment

Table 7 shows indicators calculated for the benchmark countries, reflecting the proportion of the population attaining different qualifications during the course of a year. For each indicator, we calculate the number of people who attain a qualification during the course of a year as a proportion of the number of people enrolled on the relevant programmes.

The table shows that it is relatively difficult to collect data across countries that reflects the proportion of the population enrolled on different programmes that also successfully completes those programmes. Even if this data is available, the construction and interpretation of attainment indicators relating to flows is difficult. We were able to collect data for only two countries, England and Denmark.

In the case of Denmark, we observed that some of the attainment indicators are greater than 100%. One possible explanation for this is that in Denmark students are only recorded as participating on a particular programme once they have completed the programme, and where individuals participate in a number of short programmes within the space of a year. It is then possible that due to recording delays the number of people attaining a qualification is greater than the number of people enrolled on programmes. This is particularly likely to be a problem for Entry level, Level 1 and Level 2 programmes that are typically relatively short in length. For this reason we did not consider indicators A1 and A2.

However, it is possible to compare attainment at Levels 3 and 4 or higher (indicators A3 and A4) across England and Denmark. We observed that in England a lower proportion of people of working age enrolled on programmes at Level 3 or above are likely to successfully complete them, to the point of achieving a qualification, than compared to Denmark.

**Table 7**  
Attainment indicators –  
proportion of group  
enrolled on a programme  
that successfully  
completes the programme

Indicator (%)	Australia	Canada	Denmark (2001)	US	England (2003)
A1: All adults lower than Level 2			188.78		72.09
A2: All adults Level 2			140.41		51.6
A3: All adults Level 3			85.80		63.5
A4: All adults higher than Level 3			69.50		57.25
A5: 19 year-olds Level 3			19.56		

Table 8 shows the proportion of the population aged 15–24 that has attained a Level 3 qualification (indicator A6) and the proportion of the population of working age that has attained qualifications at particular levels (indicators A7–A10). Overall, the table indicates that it is relatively straightforward to calculate indicators reflecting the stock of qualifications attained by the population of working age or other age groups.

More specifically, looking first at the proportion of the population aged between 15 and 24 that has attained a Level 3 qualification, we observe that Australia ranks the highest on the basis of this indicator, followed by Denmark and then England. The US ranks the lowest on this indicator, with only around one-in-ten of the age group holding a Level 3 qualification.

In contrast, however, when we look at the proportion of the population of working age with a qualification higher than Level 3, we find that the pattern is reversed – the US has the highest proportion of the population of working age with qualifications at Level 4 or greater, whereas Australia has the lowest. Looking at qualifications lower than Level 2, England has the highest proportion of the population of working age where the highest qualification attained is an Entry level or Level 1 qualification. At the other end of the spectrum, Australia has the lowest proportion of the population of working age with an Entry level or Level 1 qualification as the highest attainment.

**Table 8**  
Attainment indicators –  
highest level of attainment

Indicator (%)	Australia (2001)	Canada <sup>10</sup> (2001)	Denmark (2001)	US (2001)	England (2003)
A6: 15–24 year-olds Level 3	42.05	21.96	30.39	11.70	28.32
A7: All adults lower than Level 2	4.38	33.20	12.58	14.74	33.30
A8: All adults Level 2	39.90	11.51	28.46	16.76	21.80
A9: All adults Level 3	31.74	22.38	34.37	15.45	19.40
A10: All adults Level 3 or higher	23.98	32.92	24.58	53.05	25.60

<sup>10</sup> The data did not allow certificates (classed as a Level 2 qualification) to be separated out from diplomas (a Level 3 qualification). Therefore, we have allocated trade certificates and diplomas to Level 2 and college certificates and diplomas to Level 3.

In conclusion, although the table shows that it is possible to obtain comparable information on levels of attainment in different countries, our analysis does not point to one country in particular being the 'best in the world' in terms of either the highest qualification attained or the proportion of the population of working age that successfully completes programmes. Our analysis does suggest, however, that, again, Australia and Denmark perform better than England with respect of the proportion of the working population whose highest qualification is at either Level 2 or Level 3. At the upper end of the scale, the US has the highest proportion of the working population whose highest qualifications are Level 4 or higher and England ranks third behind the two North American countries.

### 6.3 Retention

Finally, we look at differences in the proportions of students across the comparator countries who complete the programmes on which they enrol.

As a general point, we found that it was most difficult to gather data reflecting retention across countries for a number of reasons.

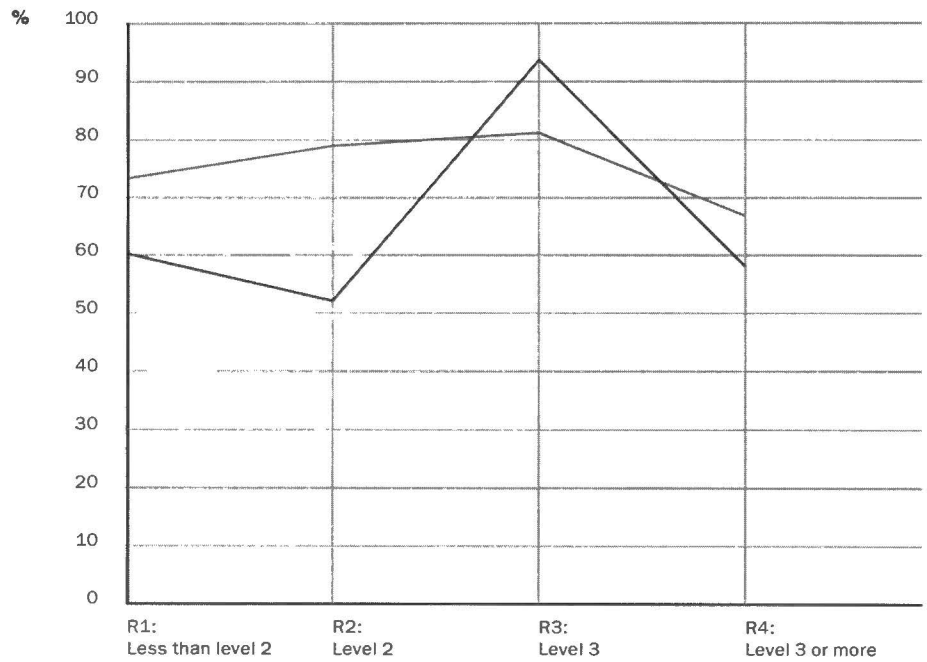
- First, we have had to rely exclusively on administrative data to construct these indicators and, given that people attend different institutions, the information to construct these on a robust basis would need to be collected from schools, further education colleges and other training providers.
- Second, construction of retention indicators for courses of differing durations is complex, as we need to have information about when people start and when they complete their programmes.
- Third, where we have information only on the numbers of people enrolled on a programme and qualifications obtained, it is difficult to identify whether people have actually dropped out of their programmes or whether they have been unsuccessful in attaining their qualifications.

In view of these difficulties, we have not conducted a cross-country comparison of the indicators that we have constructed, as we do not have comparable indicators for each of the countries. Instead, we report school retention indicators for Australia and the US for grade 10 (completion of which is broadly equivalent to attaining a Level 2 qualification) and grade 12 (completion of which is broadly equivalent to attaining a Level 3 qualification). We also compare retention indicators for Denmark and for England.

In Australia we found that the average retention rate for full-time students between year 7 or year 8 (depending on the state or territory) and year 10 in 2003 was 90.3%. In other words, nine out of ten students who started their secondary school education continued until the end of year 10. In contrast, we find that, in the US, of the students that participated in a year 10 programme in 2001–02, 95.68% completed the year. Looking at retention rates for all students in Australian schools in 2003 between year 10 and year 12, we observed that 80.7% of students who enrolled in year 10 went on to complete year 12. In contrast, in the US, 95% of students who started year 12 in 2001–02 went on to complete year 12.

Figure 2 shows retention rates for England and Denmark for programmes at different levels. Note that the indicators are not strictly comparable, as the Danish indicators cover retention on both academic and vocational programmes, whereas the English indicators do not include any information on retention within schools. Although it is difficult to make comparisons between the two countries in terms of the levels of the indicators, it is interesting to note that in both England and Denmark, retention is less of a problem for students participating in Level 3 programmes.

**Figure 2**  
Retention rates – proportion of working population enrolled on programmes at different levels who complete the programmes  
Denmark ———  
England ———







The LSDA commissioned Frontier on behalf of the LSC to undertake an empirical assessment to see whether it is possible to compare post-16 performance in the English learning and skills sector with the 'best in the world'. Specifically, this study has looked at the following questions:

- Who is the 'best in the world' in generating knowledge and skills?
- What indicators reflect the 'best in the world' in generating knowledge and skills?
- To what extent is it possible to measure the 'best in the world' in knowledge and skills?
- How well does England's post-16 education sector perform in generating knowledge and skills?

We have found that although it is possible to gather some useful information relating to participation, retention and attainment in the post-16 learning and skills sector in a number of countries, it is difficult to compare precisely post-16 performance across different countries.

Nevertheless, this study has yielded some useful information on participation in programmes at different levels for Australia, Denmark and the US. The study has also provided useful cross-country comparative information on the highest qualifications attained at different NQF levels in Australia, Canada, Denmark and the US. However, we have found it very difficult to produce any useful comparative information on retention indicators, largely because of the detailed information requirements needed to calculate these. Therefore, we can conclude that this study represents a considerable advancement in terms of providing information that the LSC requires in order to compare England's performance against the 'best in the world'.

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## 7.1

### **Who is the 'best in the world' in knowledge and skills?**

We defined the set of countries comprising the 'best in the world' as those who rank highly on indicators reflecting not only qualifications, but also knowledge and skills and productivity. On the basis of this analysis, as an initial starting point we suggested that the following countries might be good comparators for England: Australia, Finland, Denmark, Ireland, Canada, Norway, New Zealand, Japan, Belgium, the United States, Denmark, Germany, the Netherlands and France.

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## 7.2

### Indicators to reflect the 'best in the world' in knowledge and skills

Having identified which countries are the 'best in the world', we needed to select a useful set of indicators that reflect whether the LSC has successfully contributed to a learning and skills sector that generates people with productive skills. In this study we considered a list of indicators relating to:

- participation – encouraging people to enrol on programmes
- retention – ensuring that those who enrol also stay on the programme until they complete it
- attainment – attainment of qualifications act as a signifier of the programmes people have completed.

We considered indicators expressed in terms of NQF levels, focusing on Levels 2 and 3, as this is of most interest to the LSC from a policy perspective.

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## 7.3

### Data issues

We assessed the available data sources to identify which countries it would be possible to construct indicators for. We evaluated data sources in terms of the extent to which data sources recorded:

- information on participation, retention and attainment
- academic and vocational qualifications
- enough detail to enable indicators to be expressed in terms of NQF levels.

We found that only the data sources for Australia, Canada, Denmark and the US (in addition to England) fulfilled these criteria.

In constructing the indicators for these five countries, it has been necessary to draw on a wide number of data sources – both administrative sources and national Labour Force Surveys/Censuses. No single tier of data contains sufficient information to calculate the participation, retention and attainment indicators.

In addition, although we have found a number of data sources that provide information on participation, retention and attainment for the benchmark countries, much of the information recorded on qualifications is not sufficiently detailed to allow us to categorise different countries qualifications in terms of NQF levels. This has hampered our ability to produce comparable indicators across the four countries.

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## 7.4

### How does England compare to the 'best in the world'?

With regard to the extent to which England matches the 'best in the world' we conclude the following:

- No single country is the 'best in the world' on the basis of all our measures.
- England lies behind both Australia and Denmark when looking at the proportion of the population of working age currently enrolled on programmes leading to Level 2, Level 3 or Level 4 and higher qualifications.
- Australia and Denmark rank highly in terms of the proportion of the working population whose highest qualification is at Level 2 or Level 3. England ranks behind both these countries at Level 2 and also behind Canada at Level 3.

Looking ahead, to compute a robust set of indicators consistent with those defined in this study on an annual basis over the next five years would require considerably more investment on the part of the LSC. A question that the LSC/LSDA might like to consider is whether the cost of this investment is outweighed by the benefit.



**Appendix 1****List of people consulted****Tom Karmel**

(National Centre for Vocational Education and Research) – Australia

**Ken Thomassen**

(Ministry of Education) and Anne-Kathrine Mandrup (Center for Vurdering af Udenlandske Uddannelser) – Denmark

**Tom Snyder**

(National Center for Education Statistics) – United States

**Douglas Hodgkinson**

(Advanced Education Department, British Columbia) – Canada

**Hilary Steedman**

(Centre for Economic Performance, London School of Economics) – UK

In this appendix we report the population data sources that we have used to construct the indicators for each country.

**UK**

We used population estimates drawn from the Labour Force Survey (LFS) for the construction of the participation and stock attainment indicators. Given that the Labour Force Survey is a sample of the full national population, there is some degree of sampling error attached to the estimation. In the LFS the standard error of any estimate based on data for the full working age adult population of a particular gender is approximately 0.25%. Thus we can be 95% sure that the true proportion in the UK population is +/- one half of a percentage point around the estimated proportion in the report.

**Canada**

We drew on information on attainment and population from the Canadian Census. This is based on a one-in-five sample of all households. The overall response rate to the Census is around 98.4%.

**Unites States**

We used population estimates drawn from the Current Population Survey. This is a monthly survey of households conducted by the Bureau of the Census for the Bureau of Labour Statistics in the US. The non-interview rate for the survey ranges between 6% and 7%.

**Australia**

We used population data provided by the Australian Bureau of Statistics (ABS) taken from the Census. The Census is taken every five years and is regarded as a highly accurate count. In between census times ABS updates population estimates using births, deaths and migration data. The response rate to the Australia Census is around 97%.

**Denmark**

We used population data provided by Statistics Denmark. The primary source of the data is the Central Person Register. Hence the population data for Denmark is not based on an estimate.

## Appendix 3

## Data sources used to construct the indicators

	England		Denmark		Australia		Canada	US	
	ILR	NPD	MinEdu	Statbank	NVCER	NSCC	YITS	CCD	BPS
<b>Participation</b>									
P1		√	√		√				
P2		√	√		√		YITS sample		BPS sample
P3		√	√		√				
P4		√	√		√		YITS sample		
P5		√	√		√		YITS sample		BPS sample
<b>Retention</b>									
R1		FE/WBL	√						
R2		FE/WBL	√			Some info	Some info	Some info	
R3		FE/WBL	√			Some info	Some info	Some info	
R4		FE/WBL	√						
<b>Attainment</b>									
A1		√	√						
A2		√	√				YITS sample		
A3		√	√				YITS sample		BPS sample
A4		√	√						BPS sample
A5		√	√						BPS sample
A6	√			√	√				
A7				√	√				BPS sample
A8				√	√				BPS sample
A9				√	√				
A10				√	√				

**Table 9**  
Available administrative  
data sources  
by indicators

**Table 10**  
Data sources used  
to construct the  
participation indicators

<b>Indicators</b>	<b>Australia</b>	<b>Canada</b>	<b>Denmark</b>	<b>US</b>	<b>England</b>
P1	ABS, Education and Work	YITS	INTE	CPS	LFS
P2	ABS, Education and Work	X	INTE	CPS	LFS
P3	ABS, Education and Work	X	INTE	CPS	LFS
P4	ABS, Education and Work	X	INTE	CPS	LFS
P5	ABS, Education and Work	X	INTE	CPS	LFS

**Table 11**  
Data sources used  
to construct the  
attainment indicators

<b>Indicators</b>	<b>Australia</b>	<b>Canada</b>	<b>Denmark</b>	<b>US</b>	<b>England</b>
A1	X	X	INTE	X	ILR, NPD
A2	X	X	INTE	X	ILR, NPD
A3	X	X	INTE	X	ILR, NPD
A4	X	X	INTE	X	ILR, NPD
A5	X	X	INTE	X	X
A6	SETIT	Census of population	Statbank	CPS	LFS
A7	SETIT	Census of population	Statbank	CPS	LFS
A8	SETIT	Census of population	Statbank	CPS	LFS
A9	SETIT	Census of population	Statbank	CPS	LFS
A10	SETIT	Census of population	Statbank	CPS	LFS

**Table 12**  
Data sources used  
to construct the  
retention indicators

<b>Indicators</b>	<b>Australia</b>	<b>Canada</b>	<b>Denmark</b>	<b>US</b>	<b>England</b>
R1	X	X	INTE	X	ILR
R2	NCSS	X	INTE	CCD	ILR
R3	NCSS	X	INTE	CCD	ILR
R4	X	X	INTE	X	ILR

The tables above show the data sources used to construct all the indicators.





## Further information

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