

Estimating participation in education, training and employment

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Key points

- The methodology for producing the participation estimates involves combining administrative data where available from national educational and trainee databases with Labour Force Survey data where not.
- The new methodology avoids the use of imputed values that were a feature of the earlier method.
- The new methodology reduces standard errors for a number of groups including those not in education, employment or training.
- Estimates for 2000 are due to be published in a First Release at the end of June 2001.

This article describes the revised methodology for estimating young people's participation in education, training and employment, and the resulting effects on estimates.

Introduction

EACH YEAR the Department for Education and Employment (DfEE) publishes a National Statistics First Release, *Participation in Education, Training and Employment by 16 to 18-year-olds in England*. In 2000, the methodology for estimating participation was revised and a decision made to include, for the first time in the First Release, estimates by labour market status. In accordance with the principles underlying National Statistics, this article makes public the methodology used, focusing on how data from various sources are combined to provide authoritative figures on participation in education, training and employment.

Participation estimates are used extensively in the education, training and employment policies of the DfEE, so there is a clear need for them to be robust. Policy is often developed with

young people not in education, employment or training (NEET) specifically in mind, so estimates of the size of this group are particularly important. The size of the NEET group at a particular point in time is often used as a general indicator of social exclusion.

Content of the First Release

The figures in the First Release are a snapshot picture of participation at the end of the calendar year. This is done because some parts of the education sector, for example schools, do not have whole-year figures, and until 1994/95, figures for further education (FE) were only recorded on a snapshot basis.

The First Release analyses participation in education and training of 16 to 18-year-olds in England by four main routes (see *Box 1*):

- full-time education (FTEd);
- government-supported training (GST);
- employer-funded training (EFT); and
- other education and training (OET).

It also provides data on the remainder, who are in neither education nor training.

The First Release shows participation figures for:

- education and training by age, sex and route;
- education and training by age, labour market status and route;
- education by sex and course of study; and
- education and training by age and route for the previous ten years.

Participation figures by age are shown individually for 16-, 17- and 18-year-olds, and 16 to 18-year-olds combined. Additional tables are available on the Internet.¹

As examples of the estimates produced, *Figure 1* and *Table 1* show participation in education and training by age, route and labour market status for year-end 1998 and year-end 1999. The proportion of 16-year-olds in education and training at the end of 1999 is estimated

Box 1 Routes taken by young people in education and training

Full-time education (FTEd)

FTEd includes full-time study in schools, further education colleges, sixth-form colleges, specialist colleges, specialist-designated institutions and higher education institutions.

Government-supported training (GST)

GST for young people comprises Advanced Modern Apprenticeships, Foundation Modern Apprenticeships, Life Skills and other training for young people.

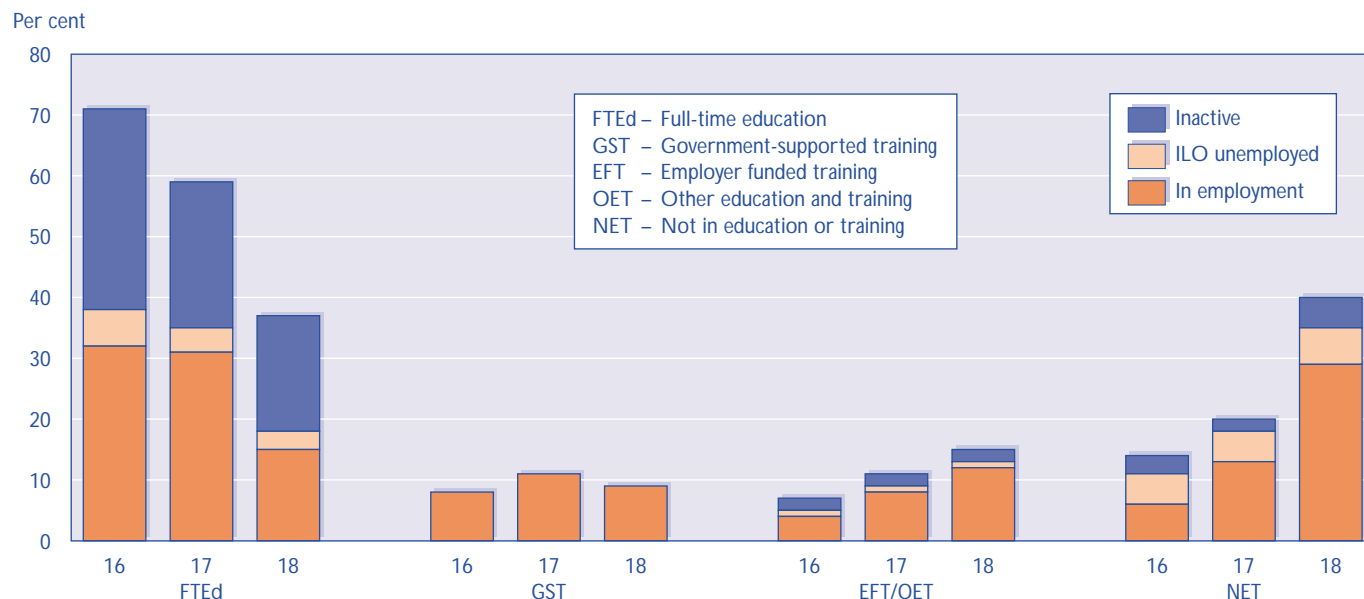
Employer-funded training (EFT)

EFT is restricted to training other than GST. This includes students who are non-GST apprentices and others on long- and short-term training programmes. All part-time higher education students are considered to be EFT. College- and non-college-based training are considered separately in the construction of estimates of participation in EFT.

Other education and training (OET)

OET includes part-time study and any training not directly related to a job. It includes both full- and part-time study at independent colleges and all young people studying but not included above. College- and non-college-based training are considered separately in the construction of estimates of participation in OET.

Figure 1 Participation in education and training of 16-, 17- and 18-year-olds by labour market status; England; 1999



Source: DfEE

Table 1 Participation in education and training of 16 to 18-year-olds by labour market status; England; at year-end 1998 and 1999

	In employment		ILO unemployed ^a		Economically inactive		All		Per cent
	1998	1999 ^b	1998	1999 ^b	1998	1999 ^b	1998	1999 ^b	
Aged 16									
Full-time education	30	32	7	6	32	33	70	71	
Government-supported training ^c	9	8	..	..	..	..	9	8	
Of which in full-time education	1	-	..	..	..	..	1	-	
Employer-funded training	4	3	..	..	..	..	4	3	
Other education and training ^d	1	1	1	1	2	2	4	5	
Total education and training^e	43	44	8	7	34	35	86	86	
Not in any education or training ^f	6	6	5	5	3	3	14	14	
All	50	50	13	12	37	38	100	100	
Population (thousands)	299	307	80	72	222	231	601	610	
Aged 17									
Full-time education	33	31	3	4	22	24	58	58	
Government-supported training ^c	11	11	..	..	..	..	11	11	
Of which in full-time education	1	-	..	..	..	..	1	-	
Employer-funded training	6	6	..	..	..	..	6	6	
Other education and training ^d	2	2	1	1	2	2	5	6	
Total education and training^e	51	49	4	5	24	26	79	80	
Not in any education or training ^f	12	13	6	5	3	2	21	20	
All	63	61	10	10	27	28	100	100	
Population (thousands)	385	372	60	63	168	171	613	606	
Aged 18									
Full-time education	15	15	2	3	20	19	37	37	
Government-supported training ^c	8	9	..	..	..	..	8	9	
Of which in full-time education	-	-	..	..	..	..	-	-
Employer-funded training	8	8	..	..	..	..	8	8	
Other education and training ^d	3	4	1	1	2	2	7	7	
Total education and training^e	35	35	3	4	22	21	60	60	
Not in any education or training ^f	27	29	8	6	5	5	40	40	
All	62	64	11	10	27	26	100	100	
Population (thousands)	384	397	70	62	170	159	624	619	
Aged 16 to 18									
Full-time education	26	26	4	4	25	25	55	55	
Government-supported training ^c	9	9	..	..	..	..	9	9	
Of which in full-time education	1	-	..	..	..	..	1	-	
Employer-funded training	6	6	..	..	..	..	6	6	
Other education and training ^d	2	2	1	1	2	2	5	6	
Total education and training^e	43	43	5	6	27	27	75	75	
Not in any education or training ^f	15	16	6	5	4	3	25	25	
All	58	59	11	11	30	31	100	100	
Population (thousands)	1,069	1,076	209	198	561	561	1,839	1,835	

a Available to start work in the next two weeks and has either looked for work in the past four weeks or is waiting to start a job already obtained.

b Data for 1999 are provisional.

c The analysis by age for all years is provisional.

d Includes part-time education not funded by employers or through government-supported training; also full- or part-time education in independent institutions.

e Total of all full-time education and government-supported training (less government-supported training in full-time education) plus employer-funded training and other education and training.

f The remainder of the age group.

- Nil or negligible.

.. Not applicable.

Source: DfEE

to be 86 per cent. For 17-year-olds, the proportion is estimated to be 80 per cent and for 18-year-olds, 60 per cent. For 16 to 18-year-olds as a whole, the figure is estimated to be 75 per cent. The provisional figures, above, indicate a slight rise in participation from the previous years. *Figure 2* shows participation in education and training of 16-, 17- and 18-year-olds, from 1990 to 1999.

Table 2 shows estimates of full-time education, training or other education, and those not in education or training. These figures are broken down by labour market status and include an estimate of those NEET. The number of 16 to 18-year-olds NEET is provisionally estimated at 157,000 at the end of 1999, a decline from 185,000 at the end of 1998.

The data sources, definitions and methodology are described below. For a fuller discussion of the figures, please refer to the First Release.¹

Coverage of the First Release

Participation rates are for England, but exclude students resident in

England and studying in schools and the FE/HE sectors outside England. They also exclude overseas students studying in higher education institutions in the UK.

Data underlying DfEE's First Release are the same as for the First Releases published by the Further Education Funding Council and Higher Education Statistics Agency.

The First Release is published in June and gives up-to-date participation rates at a national level for the current academic year. In accordance with National Statistics standards, they are published as early as possible after the statistics have been compiled. Estimates for previous years are updated when revisions to the underlying source data require it. It is necessary to revise figures for the previous year as some data are provisional, and DfEE also revises earlier years if there are changes in the underlying data. The most recent year is marked as 'provisional' and becomes 'actual' in subsequent years. Participation estimates for the years 1993 to 1998 take into account recently revised Labour Force Survey (LFS) estimates.

The latest First Release, issue 28/2000, covers participation up to 1999.¹ Figures for 2000 are due to be published at the end of June 2001. Participation in education and training of 16- and 17-year-olds at local level is covered in an annual statistical bulletin. The latest bulletin, issue 11/00, covering 1994/95 to 1998/99 was published in December 2000.¹ Figures for 1999/00 are due to be published in December 2001.

Data sources and definitions

For the major routes of study, data are collected through administrative records and are collectively known as the educational 'censuses'. Estimates are also available from the LFS and *Table 3* gives a comparison between LFS and administrative data for participation in education and training. The main differences are:

- LFS figures for full-time education are slightly higher than census data;
- the LFS consistently and considerably underestimates participation in GST (in some cases young people

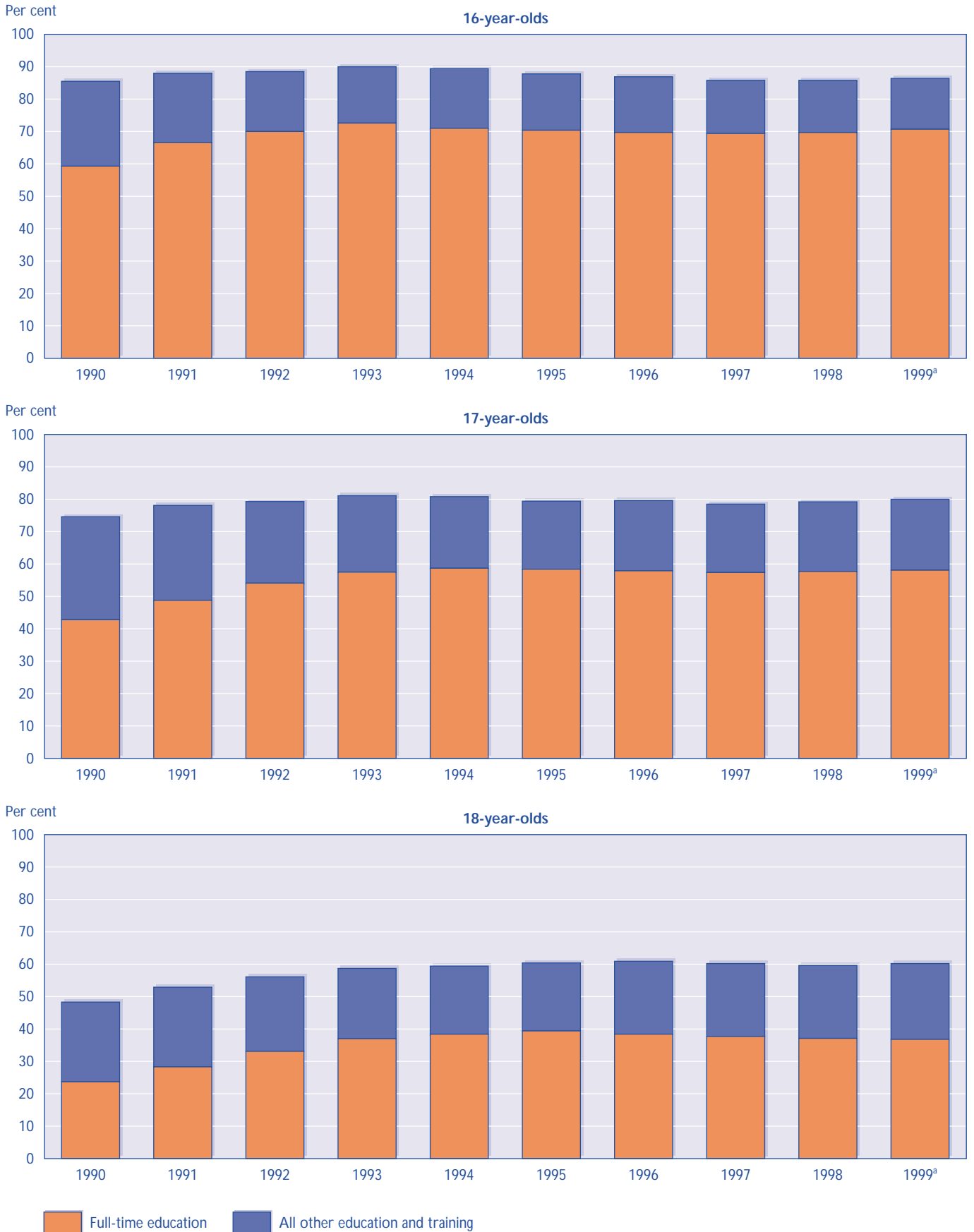
Table 2 Participation in education and training of 16 to 18-year-olds by labour market status; England; at year-end 1990 to 1999

	1990	1991	1992	1993	1994 ^a	1994 ^a	1995	1996	1997	1998	1999
	Per cent										
In employment											
Full-time education	19	20	19	22	22	22	25	26	25	26	26
In training or other education	25	23	20	19	18	17	16	17	17	17	17
No education or training	21	17	14	13	14	14	14	14	16	15	16
All in employment	65	59	54	54	54	54	56	57	58	58	59
ILO unemployed											
Full-time education	2	2	3	3	3	3	3	4	4	4	4
In training or other education	1	1	1	1	1	1	1	1	1	1	1
No education or training	7	7	8	7	6	6	6	6	6	6	5
All ILO unemployed	9	9	11	11	10	10	10	11	10	11	11
Economically inactive											
Full-time education	21	26	30	31	31	30	28	26	26	25	25
In training or other education	1	1	1	1	2	2	2	2	2	2	2
No education or training	4	4	3	4	3	3	3	3	4	4	3
All economically inactive	26	31	35	36	36	36	34	32	32	30	31
Not in education, employment or training^b	11	11	11	10	9	9	9	10	9	10	9
Not in education, employment or training (thousands)	204	198	197	173	151	152	159	169	170	185	157

Source: DfEE

a The break in time series is due to changes in the source of further education data.
 b The sum of ILO unemployed and economically inactive not in education and training.

Figure 2 Participation in education and training of 16-, 17- and 18-year-olds; England; 1990 to 1999



Source: DfEE

^a Data for 1999 are provisional.

Table 3 Comparison of sources of numbers and participation rates of young people in education and training; England; winter 1999/2000 (LFS data); year-end 1999 (administrative data)

	Thousands			Percentages		
	Aged 16	Aged 17	Aged 18	Aged 16	Aged 17	Aged 18
Labour Force Survey data						
Full-time education	436.5	371.8	234.7	74.0	61.8	40.6
Government-supported training	20.8	28.4	11.7	3.5	4.7	2.0
Employer-funded training	28.1	45.1	60.8	4.8	7.5	10.5
Other education and training	19.4	17.2	33.0	3.3	2.9	5.7
Not in education or training	84.7	139.4	237.6	14.4	23.2	41.1
Population	589.5	601.8	577.7	100	100	100
Administrative data						
Full-time education	431.6	352.0	227.9	70.7	58.1	36.8
Government-supported training	49.8	67.4	53.6	8.2	11.1	8.7
Employer-funded training ^a	5.8	9.7	15.5	1.0	1.6	2.5
Other education and training ^a	26.1	31.7	35.4	4.3	5.2	5.7
Not in education or training	96.7	145.5	286.5	15.8	24.0	46.3
Population	610.1	606.3	618.8	100	100	100

Source: Labour Force Survey, DfEE

a College-based only.

may not be aware that the training provided through their employer is GST);

- LFS estimates of participation in EFT are much higher than estimates derived from census data (LFS data include those in EFT who do not attend college, while census data would not record these);
- census estimates of OET are much higher than LFS data; and
- LFS and ONS population estimates differ as they are derived on different bases;

Where possible, administrative data are used to derive estimates. Figures for full-time education and GST are derived from educational and trainee censuses. The figures for college-based EFT and OET are also derived from census data. Young people not reported by the censuses may be in other forms of education or training, while some will not be engaged in education or training. LFS data are used to derive these estimates, as described below. *Box 2* sets out the sources used for each education and training route.

Where participants are following more than one course/route, double-counting with administrative and LFS data is avoided by assigning participants to a course/route on an ordered basis, ensuring they are included once only in participation estimates.

The age of a student or trainee is that at the beginning of the academic year, 31 August. Figures for 16-year-olds therefore relate to young people in their first year of post-compulsory education.

Administrative data

The data on students in full- and part-time education come from educational censuses. The Schools' Census provides data on pupils in maintained and independent schools in January of each year. It also provides data on students in special schools and pupil referral units.

The Further Education Funding Council's individualised student record (ISR) was established in 1994/95, and has provided data on students in the further education sector since then. The further education student number snapshot is taken at 1 November. The ISR is also used to identify the number of people who are in both FTEd and GST. These people are included in both full-time education and GST figures, and reported separately as the overlap group, but counted once only in totals.

From 1994/95, students on further and higher education courses in institutions of higher education are included from data supplied by the Higher Education Statistics Agency. The higher education student number snapshot is taken at 1 December.

Prior to 1994, the Further Education Statistical Record provided information on students in further education establishments and participants in former polytechnics and colleges of higher education. The Universities' Statistical Record provided information on university students.

GST was delivered by training and enterprises councils (TECs). Data are from the regional and head office management information database, which provides total numbers participating at the end of the calendar year. Proportions by age and sex are estimated using the information on individual trainees recorded on the trainee database system.

All data are checked for quality and accuracy by the department prior to use. Data are compared with previous years to highlight any inconsistencies and undergo further credibility checks.

In April 2001, the Learning and Skills Council (LSC) took over responsibility for recording data on further education students and work-based trainees. For this purpose, the LSC will set up a new database, the individualised learner record (ILR). The ILR will record data on learners from 2001/02 onwards for both the work-based and further education routes. Data on learners in work-based learning will be collected by local LSCs

Box 2 Sources of data on participation in education, training and employment

Route	Description of estimate	Source of data for participation estimates	Labour market status split
Full-time education (FTEd)	Full-time school or college, non government-supported training (GST)	Educational census figure	LFS proportions
FTEd, GST	FTEd with GST	Educational census figure for FTEd and GST overlap	Employed only
GST	Other GST, college	Educational census figure for part-time education and GST overlap	Employed only
	Other GST non-college	GST figure from TEC Management information minus full- and part-time overlap	Employed only
Employer-funded training (EFT)	EFT, college	Educational census figures for part-time released and part-time higher education students	Employed only
	EFT, non-college	Residual of population minus census data apportioned to EFT non-college, other non-college and not in education or training, based on a five-year weighted average of LFS proportions for these groups	Employed only
Other education and training (OET)	Other college	Educational census figure for part-time non-released students	LFS proportions
	Other non-college	Residual of population minus census data apportioned to EFT non-college, other non-college and not in education or training, based on a five-year weighted average of LFS proportions for these groups	Five-year weighted average of LFS proportions
Not in education or training (NET)		Residual of population minus census data apportioned to EFT non-college, other non-college and not in education or training, based on a five-year weighted average of LFS proportions for these groups	Five-year weighted average of LFS proportions
Total		Population	Determined by the labour market status split of all components

through existing systems and converted to ILR format. Data on students in the further education sector will continue to be recorded in the ISR in 2001/02 and this will be converted to the ILR format. The ILR will eventually replace existing systems.

Labour Force Survey data

Census figures are not available for non-college-based EFT and OET. These, together with numbers who are not in education or training, are derived from LFS data. Figures for EFT cover apprenticeships and employees receiv-

ing job-related training (on and off the job) in the four weeks prior to interview.

The LFS data used in estimates of participation are from the winter quarter, December to February. LFS data for 1992, when the survey moved from an annual to a quarterly basis, and earlier relate to the spring quarter. Age is calculated as at 31 August, the same as for other data sources.

The LFS is a household survey and estimates are grossed using household population estimates, i.e. excluding those living in communal establishments. ONS population estimates, on

the other hand, include those living in communal establishments.

Nevertheless it has been assumed for the purposes of estimating participation in education, training and employment that the breakdown of LFS population is similar to the national population.

Population estimates

Population estimates are used as the denominator when calculating participation rates for a particular age group. Population data are derived from mid-year estimates provided by ONS, and from projections provided by the

Government Actuary's Department. They are modified to a reference date of 1 January with age as at the beginning of the academic year 31 August.

The ONS estimates are produced using a standard demographic method and the best data sources available. The cohort component method considers population change, the most difficult aspect of which is migration. Any errors in the data are cumulative, so the population estimates are revised in the light of the decennial population Census. For example, once the results of the 2001 Census are known, population estimates for 1992 to 2000 will be revised. Such revisions can lead to retrospective changes in participation rates and the numbers who are NEET.

Estimates by labour market status

In addition to estimating the level of EFT, OET and those not in education or training, LFS data are used to derive participation estimates by labour market status. The labour market status of a participant refers to their economic activity, in one of three groups defined by the International Labour Organization (ILO):

- employed – an employee, self-employed, on a GST programme or an unpaid family worker;
- ILO unemployed – anyone (including full-time students) who is out of work and available to start work in the next two weeks, and has either looked for work in the last four weeks or is waiting to start a job they have already obtained; and
- economically inactive – neither in employment nor ILO unemployed.

One of the main categories of interest identifiable from this cross-classification is those who are NEET. Estimates of participation by labour market status were previously published in a statistical bulletin, the latest being issue 11/99, *Education and Labour Market Status of Young People aged 16 to 18 in England: 1992 to 1998*. Including them in the First Release allows the figures to be published more than three months earlier.

Review of methodology

In 2000, a decision was made to

Table 4

Participation in education and training of young people by academic age and labour market status; England; winter 1999/2000, not seasonally adjusted

	Aged 16	Aged 17	Aged 18	Per cent Aged 16 to 18
In employment				
Labour Force Survey (original method)	49.2	60.4	62.4	57.4
Revised method	50.2	61.4	64.2	58.7
ILO unemployed				
Labour Force Survey (original method)	11.8	10.6	10.0	10.8
Revised method	11.9	10.4	10.1	10.8
Economically inactive				
Labour Force Survey (original method)	39.0	28.9	27.5	31.8
Revised method	37.9	28.2	25.7	30.6

Source: Labour Force Survey, DfEE

review the methodology for combining data from the educational and training censuses with estimates of labour market status from the LFS. The aim was to produce estimates of participation by labour market status in the June First Release for the first time, improve the precision of the estimates and make them more systematic.

As a result of the changes outlined below, the standard errors for certain sub-groups of the population have been reduced.

Original methodology

In the original method for calculating participation estimates, the total estimates of education and training derived from the LFS are set against the estimates derived from administrative data. Two categories of education and training are not covered by the census estimates: those parts of OET and EFT that are not taking place in colleges of further education. The residual derived by subtracting census-based education estimates from the LFS estimate of total education is attributed to OET non-college study, and the corresponding difference for training to EFT non-college.

One problem with this procedure is that, in certain years, these residuals were negative quantities. It was therefore necessary to impute values for them, based on trends in participation. This had a marginal impact on the overall estimates of education and training, but it had a relatively greater impact on the estimate of the smaller

residual total of those not in education or training.

Labour market status breakdown is then derived as follows: The overall population estimate is broken down in LFS proportions. Those in GST and EFT are employed by definition. Those in full-time education are classified as employed, unemployed or inactive according to the proportions implied by the LFS. The labour market status of college- and non-college-based OET are imputed values broken down in constant proportions, in order to avoid reliance on small samples. Those not in education or training are broken down across labour market status as a residual from the above.

Revised methodology

The revised method for calculating participation estimates (summarised in *Box 2*) is not susceptible to the problem outlined above. Census counts are, as before, used to determine the totals for FTEd, GST, the overlap between GST and FTEd, and the college-based parts of EFT and OET. The total of the remaining three groups (not in education or training, and EFT and OET non-college) is then determined as a residual value, subtracting the sum of the census counts from the known population. This residual is then sub-divided across the three groups in line with the proportions implied by the LFS, using five-year weighted averages to avoid small sample difficulties (using weights in the ratio 5:4:3:2:1, most recent year first).

Table 5 Young people aged 16 to 18 not in education, employment or training; England; at year-end 1995 to 1999

	1995	1996	1997	1998	Thousands 1999 ^a
Original method	155	161	167	182	158
Revised method	159	169	170	185	157

Source: DfEE

a Data for 1999 are provisional.

Table 6 Ratio of estimated standard errors of estimates for young people aged 16 to 18 not in education, employment or training using revised and original methodologies; at year-end 1995 to 1999

	1995	1996	1997	1998	Per cent 1999 ^a
Women	82	91	86	90	85
Men	86	94	90	89	93
All	84	92	88	89	90

Source: DfEE

a Data for 1999 are provisional.

Labour market status breakdown is then derived as follows: those in GST and EFT are employed by definition; those in FTEd or other college-based education are classified as employed, unemployed or inactive according to the proportions implied by the LFS. Those in OET non-college and those not in education or training are treated in the same way except, again, a five-year weighted average of LFS data is used to rectify the small sample problem.

Effects of changes to the methodology

The effects of changes to the methodology can be seen in the overall labour market status breakdown and the numbers who are NEET. *Table 4* shows a comparison of labour market status breakdown for raw LFS data and estimates obtained using the revised methodology. The difference in 1999/00 for 16 to 18-year-old NEET

estimates, i.e. ILO unemployed and inactive combined, is 1.3 percentage points.

Table 5 shows an estimate of the number of 16 to 18-year-olds NEET, using both the original and revised methods.

One advantage of the new method is that the standard errors of the estimates for certain groups are reduced, as discussed below. Another advantage is the avoidance of imputed values, which were a feature of the original method.

One slight disadvantage of the new methodology is that it produces estimates of labour market status for the whole cohort that do not exactly match those derived from the LFS. In the previous method, the labour market status breakdown of the not-in-education-or-training group was constrained so that equivalence between the LFS and DfEE's estimates of the overall labour market status split was maintained.

Because, however, the overall labour market status breakdown is effectively a weighted average of the labour market status breakdown for the group in education and training and the group not in education or training, the revised method does not provide this equivalence. As the estimate of the group in education and training shown by the censuses is different from that shown by the LFS, the weights used for labour market status breakdown in the revised method are different from those implied in the LFS; this results in slightly different estimates of labour market status in the population as a whole.

Standard errors of participation estimates

Obtaining accurate estimates of standard errors for participation estimates is difficult because of the complex nature of the combination of LFS and administrative data. This is particularly the case with the original method due to the use of imputed values. However, it is reasonably straightforward to obtain approximate estimates through a simplified analysis, sufficient to provide an indication of differences in precision between the two methods.

The analysis shows that the standard errors are improved, typically by around 10 per cent (see *Table 6*). In the revised method, only the LFS sampling variability associated with those not in education or training contributes to the standard error of the NEET estimate. In the original method, where NEET is estimated as a residual, sampling variability of those in OET but not covered by the censuses also contributes.

In addition, with the revised method, errors associated with imputed values and assumed constant proportions are avoided.

Further information

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Note

- 1 The latest First Release, issue 28/2000, is available to download from the DfEE website at <http://www.dfee.gov.uk/statistics/DB/SFR/index.html> and the latest statistical bulletin, issue 11/00, is at <http://www.dfee.gov.uk/statistics/DB/SBU/index.html>.