MEASURING UP
HOW GOOD ARE THE GOVERNMENT'S
DATA SYSTEMS FOR MONITORING PERFORMANCE
AGAINST PUBLIC SERVICE AGREEMENTS?

JUNE 2010

Comprehensive Spending Review 2007 covering the period 2008-2011

Review of the data systems for Public Service Agreement 2 led by the Department for Business, Innovation and Skills:

'Improve the skills of the population, on the way to ensuring a world-class skills base by 2020'

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Summary

Introduction

1. This report summarises the results of our examination of the data systems used by the Government in 2009 to monitor and report on progress against PSA 2 "Improve the skills of the population, on the way to ensuring a world-class skills base by 2020".

The PSA and the Departments

2. PSAs are at the centre of Government's performance measurement system. They are usually three year agreements, set during the spending review process and negotiated between Departments and the Treasury. They set the objectives for the priority areas of Government's work.

3. This PSA is led by the Department for Business, Innovation and Skills (the Department). The Department was formed on 5 June 2009 following the merger of the Department for Business Enterprise and Regulatory Reform (BERR) and the Department for Innovation, Universities and Skills (DIUS). This PSA was previously led by DIUS.

4. Data for the measurement of this PSA is provided by the Learning and Skills Council; the Data Service[1]; the Higher Education Statistics Agency[2] and the Office for National Statistics. Each PSA has a Senior Responsible Officer who is responsible for maintaining a sound system of control across Departmental boundaries that supports the achievement of the PSA. The underlying data systems are an important element in this framework of control.

5. The most recent public statement provided by the Department on progress against this PSA was in the 2009 Autumn Performance Report[3].

The purpose and scope of this review

6. The Government invited the Comptroller and Auditor General to validate the data systems used by Government to monitor and report its performance. During the period September 2009 to January 2010, the National Audit Office (NAO) carried out an examination of the data systems for all the indicators used to report performance against this PSA. This involved a detailed review of the processes and controls governing:

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[1] Established in 2008 and funded by the Department for Business, Innovation and Skills and supported by the Learning and Skills Council to act as a single, central point of information for further education.
[2] Set up in 1993 by agreement between the relevant government departments, the higher education funding councils and the universities and colleges to provide a system of data collection, analysis and dissemination in relation to higher education in the UK.
[3] Published December 2009 – URN 09/P36 available from www.bis.gov.uk

- The match between the indicators selected to measure performance and the PSA. The indicators should address all key elements of performance referred to in the PSA;

- The match between indicators and their data systems. The data system should produce data that allows the Department to accurately measure the relevant element of performance;

- For each indicator, the selection, collection, processing and analysis of data. Control procedures should mitigate all known significant risks to data reliability. In addition, system processes and controls should be adequately documented to support consistent application over time; and

- The reporting of results. Outturn data should be presented fairly for all key aspects of performance referred to in the target. Any significant limitations should be disclosed and the implications for interpreting progress explained.

7. Our conclusions are summarised in the form of traffic lights (see Figure 1). The ratings are based on the extent to which Departments have:

(i) put in place and operated internal controls over the data systems that are effective and proportionate to the risks involved; and

(ii) explained clearly any limitations in the quality of its data systems to Parliament and the public

8. The remaining sections of this report provide an overview of the results of our assessment, followed by a brief description of the findings and conclusions for each individual data system. Our assessment does not provide a conclusion on the accuracy of the outturn figures included in the Department's public performance statements. This is because the existence of sound data systems reduces but does not eliminate the possibility of error in reported data.

Figure 1: Key to traffic light ratings

Rating	Meaning …
GREEN (fit for purpose)	The data system is fit for the purpose of measuring and reporting performance against the indicator
GREEN (disclosure)	The data system is appropriate for the indicator and the Department has explained fully the implications of limitations that cannot be cost-effectively controlled
AMBER	Broadly appropriate, but needs strengthening to ensure that remaining

(Systems)	risks are adequately controlled
AMBER (Disclosure)	Broadly appropriate, but includes limitations that cannot be cost-effectively controlled; the Department should explain the implications of these
RED (systems)	The data system is not fit for the purpose of measuring and reporting performance against the indicator
RED (Not established)	The Department has not yet put in place a system to measure performance against the indicator

Overview

9. The Government's long-term vision is that the UK is a world leader on skills, in the upper quartile of the Organisation for Economic Co-operation and Development rankings by 2020, meeting the recommendation by the Leitch Review of Skills[4], which proposed a series of objectives for the UK to reach by 2020. PSA 2 sets out the progress the Government will make on this vision with a series of interim targets to drive performance in the further and higher education systems and to improve the skills of the UK population at all levels.

10. This PSA is supported by six indicators. For this PSA, we have concluded that the indicators selected to measure progress are consistent with the scope of the PSA and afford a reasonable view of progress. However, no formal definition of a world class skills base is given and there is no indicator amongst the indicator set that measures international ranking.

11. At the time of our review, governance arrangements around the control framework were being revised following the creation of the Department in June 2009. The range of governance processes in place over PSAs included:

- Departmental management board monitoring of PSA performance on a regular basis;

- PSA programme board led by a senior responsible officer, responsible for risk management on individual PSA indicators with a remit to escalate risks to the management board; and

- responsibility for data quality residing in the PSA sponsor directorate with a named data owner responsible for data compilation for each indicator, supported by analysts.

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[4] Prosperity for all in the global economy – world class skills, HM Treasury, December 2006

12. Overall quality assurance is the responsibility of the sponsor Directorate. While the Department has underlying quality and training measures in place there is no standardised quality control methodology applied across directorates. Quality control processes are generally undertaken by individual data owners and their team, who complete checks on their respective indicator. However in a number of cases reliance is placed on the controls in operation by other government bodies, which are not always reviewed regularly for adequacy.

13. The Department has procedural documentation and manuals in place documenting processes used to quality assure and calculate data, however in some cases procedures for identifying and assessing risks to data reliability, controls, and other processes involved in measuring targets were not always documented. A high level risk register is in place for the PSA.

14. The Department's internal audit unit undertook a scoping exercise in 2008-09 with regards to the Skills PSA which mapped and agreed the assurance framework for the Skills PSA Programme. Internal Audit concluded that the framework is robust with a range of management and independent assurances available to the Senior Responsible Officer. They found that areas of work key to delivery are designated as priority projects which report to the Skills PSA Board, providing effective challenge and scrutiny by senior managers. Below programme level, projects are structured into four sub-programmes which they concluded as providing an effective governance framework.

15. Where these issues have a specific impact on individual indicators, we explore them further in the next section of this report.

16. Figure 2 summarises our assessment of the data systems.

Figure 2: Summary of assessments for indicator data systems

No	Indicator	Rating
1	Proportion of people of working age achieving functional literacy and numeracy skills (National target – 597,000 people of working age to achieve a first level 1 or above literacy qualification, and 390,000 to achieve a first entry level 3 or above numeracy qualification)	**GREEN (fit for purpose)**
2	Proportion of working age adults qualified to at least full level 2 (National Target – 79% of working age adults qualified to at least full level 2)	**AMBER (Systems)**
3	Proportion of working age adults qualified to at least full level 3 (National Target - 56 % of working age adults qualified to at least full	**AMBER (Systems)**

No	Indicator	Rating
	level 3).	
4	Apprenticeship completions (National Target - 130,000 apprentices to complete the full apprenticeship framework).	**GREEN (fit for purpose)**
5	Proportion of working age adults qualified to Level 4 and above (National Target - 36 % of working age adults qualified to Level 4 and above by 2014, with an interim milestone of 34 % by 2011).	**AMBER (Systems)**
6	Higher Education Initial Participation Rate (National Target - Increase participation in Higher Education towards 50 % of those aged 18 to 30 with growth of at least a percentage point every two years to the academic year 2010/11).	**GREEN (disclosure)**

17. Our main conclusions on the PSA are:

- there is a good match between the indicators and the data being used to monitor their progress;

- the Department has made adequate disclosure of the inherent weaknesses in the data it is using. There is however scope for the Department to be more explicit about weaknesses within its Departmental Annual Reports and Autumn Performance Reports;

- the Department is undertaking appropriate work in order to strengthen those systems that have received an amber rating and improve the quality of data; and

- where previous validation work has indicated areas of improvement the Department has carried out further work to quantify the impact of weaknesses or implemented improved methodologies.

18. We recommend that the Department:

- carries out risk assessments on the supply of external data it uses to ensure third parties have adequate controls in place. This would also serve to identify where changes in data sets may impact on data quality;

- ensures evidence is available for all data controls and processes which are in place; and

- develops a definition for a world class skills base supported by an indicator that measures international ranking.

Assessment of indicator set

19. In undertaking the validation we read the documentation associated with the PSA, including the Delivery Agreement and considered whether the indicators selected to measure progress are consistent with the scope of this PSA.

20. We conclude that the indicators selected to measure progress are consistent with the scope of the PSA and afford a reasonable view of progress. However, no formal definition of a world class skills base is given and there is no indicator among the indicator set that measures international ranking.

Findings and conclusions for individual data systems

21. The following sections summarise the results of the NAO's examination of each data system.

Indicator 1

Proportion of people of working age achieving functional literacy and numeracy skills

Conclusion: Green (Fit for purpose)

22. The data system involved is relevant and appropriate to measure progress against this indicator. The indicator is relatively simple, and where reliance is placed on assumptions or proxies these are evidence based.

23. We do not consider there to be any risks which have implications for the quality of the data reported. There are minor improvements regarding the specification of the data system and reporting of assumptions used that could be made (see paragraphs 30 and 31).

Characteristics of the data system

24. The data system records the number of people achieving qualifications of the relevant level who had not previously attained that level of basic literacy or numeracy.

25. The number of people of working age achieving a qualification in functional literacy or numeracy is calculated using information recorded on Individualised Learner Records (ILR) which are managed by the Learning and Skills Council. Functional literacy is defined as Level 1[5] and functional numeracy is defined as Entry Level 3[6]. These are based upon the National Standards for adult literacy and adult numeracy. Since 2004 all qualifications that count towards the target have been accredited by the Qualifications and Curriculum Authority, which assigns each qualification a level on the National Qualifications Framework.

26. The ILR is completed by training providers in order to receive funding from the Learning and Skills Council. Funding received is based on eligible learners completing relevant qualifications and skills. Filters are applied to the raw data to only select learners that are of working age, based on their reported date of birth.

27. Additionally, the 2010 Skills for Life survey will be able to provide updated evidence on the proportion of the population of England who already possess functional literacy and numeracy skills. The current baseline for this is a 2003 survey. The sampling

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[5] The second level on the National Qualifications Framework equivalent to GCSE grades D to G
[6] The first level on the National Qualifications Framework equivalent to level 3 of the National Curriculum, which is expected to be reached in Year 4 of primary school.

strategy for the 2010 survey will use random probability selection of 7,750 people aged between 16 and 65 living in private residential households in 944 census wards sampled using the restricted version of the Postal Address File. This should ensure that only people of working age are included in the sample.

28. The Department has estimated that likely margins of error (with a 95 per cent confidence interval) in comparing the 2010 survey with the 2003 survey are 1.7 per cent for literacy and 2.3 per cent for numeracy. In order to ensure comparability between the 2003 and 2010 surveys, a large scale pilot (900 interviews) will be conducted to generate a conversion function between the 2003 and 2010 surveys. 450 respondents will complete the old and new literacy tests and a similar number the old and new numeracy tests. The generation of a conversion function should allow accurate comparison between the 2003 and 2010 survey results.

Findings

29. Since the 2008/09 academic year the ILR data has been collected by the Data Service established in April 2008. Quality assurance procedures are applied to the data by the Data Service which, since September 2009, has undertaken quality assessments for ILR datasets including completeness checks. on selected records. There are strong procedures for verification of ILR data which include: pre-submission validation using approved software; post-submission validation against Information Authority rules and warning reports to providers regarding accepted but potentially incorrect data.

30. Audits are undertaken by the Learning and Skills Council of funding provided to training providers which include substantive testing of ILR data. These audits regularly identify errors with ILR data around eligibility and entitlement to learning and evidence of learning actually achieved. The Learning and Skills Council's most recent assessment (for 2008-09) indicates error rates, by value, of some 1.6 per cent to 4.9 per cent across various funding programmes. These would not have a significant impact on the quality of the data system.

31. Training providers currently do not specify the entry level qualification people are taking, although the Department is planning to make this mandatory. The Department makes assumptions regarding entry levels (50 per cent for level three numeracy and 8.5 per cent for learners who start at entry level 1 for literacy and 3 for numeracy but jump a level due to their ability), but these assumptions are based on relevant research.

32. The simple nature of the data system means that data is easily comparable and the analysis is robust with clear rules controlling data adjustments and derived variables. Departmental staff also undertake quality assurance processes to ensure the quality of data reported.

33. The indicator is consistent with a trajectory towards the Leitch 2020 ambition of 89 per cent of people of working age possessing functional literacy, and 81 per cent possessing functional numeracy skills by 2011.

Indicator 2

Proportion of working age adults qualified to at least full Level 2

Indicator 3

Proportion of working age adults qualified to at least full Level 3

Indicator 5

Proportion of working age adults qualified to Level 4 and above

Conclusion: Amber (Systems)

34. The data system underpinning these indicators is appropriate to measure progress against the indicator, and the system addresses the majority of risks to data quality. The Department is conducting research to assess whether the system needs further strengthening to ensure that remaining risks to the accuracy of the data collected are adequately controlled.

Characteristics of the data system

35. The Office for National Statistic's (ONS) Labour Force Survey is used to measure progress against these indicators. Responses to the education and employment sections of the survey are used to determine the highest qualification held by respondents.

36. These qualifications are then assigned to the corresponding National Qualifications Framework and weighted based on census data. The National Qualifications Framework sets out the levels against which a qualification can be recognised in England. For example a GCSE pass grades A* to C is a level 2 qualification, an A level pass is at level 3 .

Findings

37. The system is relevant and well defined however there are challenges in collecting accurate data of this nature on a household survey. The Department has commissioned an Education and Training Review which is looking into the use of the Labour Force Survey to measure adult attainment and aims to determine the best way to improve the data set.

38. At the time of our review the issues that the Department had identified for further investigation included:

- potential for bias in data as a result of survey non-responses if refusals and non-contacts have differential levels of attainment from those who respond;

- whether the current method of grossing to population totals (by gender, age and region) adequately reflects the household structure of England;

- some errors in reported qualifications as a result of accepting proxy responses, where an interviewee is providing responses on behalf of another household member;

- a risk of mis-reporting of highest qualification level, particularly in relation to vocationally related qualifications due to the large number of these qualifications not being coded to the National Qualifications Framework;

- the apportionment of 'other' qualifications to the National Qualifications Framework using a ratio that may be out of date; and

- the wave pattern of the Labour force Survey, whereby households are included in the sample for five successive quarters, may introduce bias, where respondents who drop out after wave 1 tend to be less qualified than those who respond only after wave 1.

39. Resolving these issues may be possible by adjusting results or amending the Labour Force Survey itself and the Department is taking forward further research on both fronts. As a result of statistical research published in February 2010, the ONS and Department agreed to change the method for calculating the estimates of adult educational attainment.

40. The ONS has appropriate procedures in place over the data processing and the Department has adequately documented the analytical techniques it uses.

Indicator 4

Apprenticeship completions

Conclusion: Green (Fit for purpose)

41. The data system involved is relevant and appropriate to measure progress against this indicator.

42. The system is a count of apprenticeship completions and therefore subject to limited risk. We do not consider there to be any risks which have implications for the quality of the data reported.

Characteristics of the data system

43. The Learning and Skills Council's Work Based Learning Individualised Learner Record (ILR) is used as the basis for a simple count of the number of apprenticeship completions.

44. The indicator is a count of the number of people who have completed all three areas of their apprenticeship programme (National Vocational Qualification, Technical Certificate and basic skills), these are recorded on the ILR. These records are completed by training providers in order to receive funding from the Learning and Skills Council.

Findings

45. As described in paragraph 29 to 30 above, there are strong procedures for verifying ILR data making it robust and verifiable.

46. The simple nature of the data system means that data is easily comparable and the analysis is robust with clear rules controlling data adjustments and derived variables. There are also checks and quality assurance procedures applied to the data by the Data Service, the Learning and Skills Council and the Department's staff to ensure the quality of data reported.

Indicator 6

Higher Education Initial Participation Rate (HEIPR)

Conclusion: Green (Disclosure)

47. The data system involved is relevant and appropriate to measure progress against this indicator and the Department has explained fully the implications of limitations that cannot be cost-effectively controlled.

48. Operation of the data system supporting participation in higher education is robust, reliable and the majority of risks to data quality are addressed. The problems with under and over-counting have been resolved by introducing a new matching process for the 2007/08 academic year data.

49. We do not consider there to be any risks which have implications for the quality of the data reported.

Characteristics of the data system

50. Participation is measured using the Higher Education Initial Participation Rate (HEIPR) which is released as a National Statistic in April each year. It takes account of data from the Higher Education Statistics Agency (HESA), the Learning and Skills Council (LSC) and mid‑year population estimates from the Office for National Statistics.

51. The participation rate (HEIPR) is the sum of the participation rates for each single year of age from 17 to 30. These rates are calculated as the number of first-time England domiciled entrants to higher education divided by the number of England domiciled people.

Findings

52. The data system is reliable and previous weaknesses identified have been addressed including:

- under-counting due to the exclusion of English students studying higher education in further education colleges in Wales and Scotland, as both these are included;

- over and under-counting due to prior experience of higher education not being taken into account for LSC data but excluded from HESA data even if less than six months experience - resolved by the introduction of a new matching process;

- over-counting due to duplicate HESA and LSC records is corrected for by using the new matching process; and

- clarification of movement required to measure progress (one percentage point every two years).

53. A weaknesses with the system previously identified by the National Audit Office that has not been resolved concerns under-counting in higher education overseas, or private institutions, and those studying in Northern Ireland. Research into quantifying those in overseas and private institutions has been conducted and no reliable method for their inclusion found. As the Scottish and Welsh components together make up less than a tenth of a percentage point the exclusion of those studying in Northern Ireland will not impact on the quality of data reported.

54. The Higher Education Funding Council for England's matching files which go back to 1994 are used to identify prior higher education experience. Due to data protection a "fuzzy matching" process is used to match individuals. The matching process is well designed and an effective method to identify those who have previously studied at higher education institutions.

55. The above change in methodology of the HEIPR means that from the 2007/08 academic year onwards rates are not explicitly comparable to previously published rates. The Department published comparisons for 2007/08 in the March 2009 Statistical First Release with recalculated rates under the new methodology.

56. The implication of the above changes has been fully explained in both the Statistical First Release and the 2009 DIUS Departmental Annual Report.