CfBT Education Trust

Data dictatorship and data democracy: understanding professional attitudes to the use of pupil performance data in English secondary schools

Research summary

Anthony Kelly
Christopher Downey
with
Willeke Rietdijk

Providing education for public benefit worldwide

UNIVERSITY OF Southampton
School of Education

Welcome to CfBT Education Trust

CfBT Education Trust is a top 50 UK charity providing education services for public benefit in the UK and internationally. Established 40 years ago, CfBT Education Trust now has an annual turnover exceeding £100 million and employs 2,300 staff worldwide who support educational reform, teach, advise, research and train.

Since we were founded, we have worked in more than 40 countries around the world. Our work involves teacher and leadership training, curriculum design and school improvement services. The majority of staff provide services direct to learners: in nurseries, schools and academies; through projects for excluded pupils; in young offender institutions and in advice and guidance centres for young people.

We have worked successfully to implement reform programmes for governments throughout the world. Government clients in the UK include the Department for Education (DfE), the Office for Standards in Education, Children's Services and Skills (Ofsted), and local authorities. Internationally, we work with educational ministries in Dubai, Abu Dhabi and Singapore among many others.

Surpluses generated by our operations are reinvested in educational research and development. Our research programme – Evidence for Education – aims to improve educational practice on the ground and widen access to research in the UK and overseas.

Visit www.cfbt.com for more information.

Welcome to the University of Southampton

The University of Southampton (www.southampton.ac.uk) is a leading UK teaching and research institution with a global reputation for leading-edge research and scholarship in engineering, science, social sciences, health, arts and humanities. With over 22,000 students, around 5,000 staff and an annual turnover of almost £400m, it is one of the top 100 universities in the world. A founding member of the Russell Group of research-intensive universities, it combines academic excellence with an innovative and entrepreneurial approach to research.

Acknowledgements

We would like to record our appreciation for the support we received from CfBT Education Trust – in particular from Karen Whitby – throughout the lifetime of this project.

The views and opinions expressed in this publication are those of the authors and do not necessarily represent the views of CfBT Education Trust.

© Copyright CfBT 2010

Contents

	About the authors	2
	About this report	3
	Summary of findings	3
1.	Introduction and background	5
2.	Sampling and methodology	7
3.	The extent of use of pupil data	11
4.	Satisfaction with level of use ('usage')	13
5.	Confidence in skills to access, utilise and interpret data	15
6.	Using pupil performance data to inform teaching and management	17
7.	How school staff rate their own understanding of pupil performance data	20
8.	Training and continuing professional development	23
9.	Own sources of pupil performance data	25
10.	The management, analysis and interpretation of data – who does what and who should do what in schools	27
11.	Availability of pupil performance data	29
12.	Access to RAISEonline	30
13.	Rationale for collecting performance data – what it is and what it should be	31
14.	Conclusion	38
	References	40

About the authors

Anthony Kelly

Anthony Kelly is Professor of School Improvement and Political Economy at the University of Southampton, researching in the areas of policy and improvement/effectiveness theory, innovative practice in educational management, governance and policy analysis, adapting capability and game theoretic concepts to education, and developing innovative quantitative approaches.

His most recent books are on the use of game theory in decision-making (Cambridge University Press), conceptualising a theory of intellectual capital for use in schools (Kluwer Academic Press), adapting Sen's capability theory to school choice (Palgrave Macmillan) and with his colleague Christopher Downey, the use of effectiveness data for school improvement (Routledge).

Professor Kelly worked previously at the University of Cambridge and before that as a headteacher in Ireland. His headship in Ireland coincided with some of the worst periods of political upheaval there and he was one of the leading figures in education in the border region, where he developed new governance structures. He initiated and led the first school in Ireland to be built and managed by a public-private finance partnership, and he served as the educational representative on the Committee for Peace and Reconciliation. He retains an involvement in British-Irish affairs to improve understanding of the conflict in Northern Ireland and of Anglo-Irish relations generally.

Professor Kelly is founding editor of the journal 'Education, Knowledge and Economy', and serves on the board of several other peer-reviewed journals and national steering groups. He is an elected Fellow of the Institute of Physics and the Institute of Mathematics, a Fellow of the Royal Statistical Society and the New York Academy of Sciences and a member of various national education research associations in Britain, the U.S.A. and Australia.

Christopher Downey

Christopher Downey is a Lecturer in Education at the University of Southampton, researching within the fields of School Effectiveness and Improvement. Chris has a keen interest in seeing educational research and practice informing each other. He works extensively with teachers, school and college leaders and local authority staff, supporting practitioners in their use of a wide range of data to inform the processes of self-evaluation and institutional development, and also helping them to get to grips with the intricacies of their school and pupil level data.

Chris has 12 years' experience working in secondary schools as a classroom teacher, Head of Department and member of a school Senior Leadership Team. He has also worked as a Researcher in Residence for a Local Authority Children's Services division in a two-year project focusing on the use of data for school improvement within the context of Every Child Matters. He serves on the board of the International Congress on School Effectiveness and Improvement (ICSEI) and is a member of education research associations in Britain and the U.S.A.

Willeke Rietdijk

Willeke Rietdijk is a Research Fellow at the School of Education, University of Southampton. After obtaining a Masters degree in Clinical Psychology in The Netherlands, Willeke worked as a research assistant in psychosocial oncology and as a secondary school careers adviser. She has also worked as a tutor of quantitative and qualitative research methods at the Faculty of Business Administration, Free University of Amsterdam.

About this report

This report presents findings from a nationwide survey of English secondary school teachers on their use of, and attitudes towards, pupil performance and progress data. Participants were drawn from the full range of teaching experience, level of responsibility and subject background, and from a range of schools. The project investigated, using a mixed methods approach, the extent to which staff in schools are satisfied with their level of understanding of data, whether they have sufficient time to engage with it, whether they require better training to interpret and utilise it, and the extent to which they think that the data tells them something 'they don't already know'. **This report is a summary designed to highlight the key findings of the survey. The full report is available from the CfBT website:** www.cfbt.com/evidenceforeducation

Summary of findings

Use of pupil attainment and progress data is widespread across the profession, but least so among classroom teachers. Schools with low raw attainment scores but positive CVA scores report the most frequent use; coasting schools and schools with negative CVA the least. There are no significant differences across the subjects and between genders, but NQTs and young teachers show the lowest extent of usage.

Satisfaction with usage is also relatively high throughout the profession. Schools with positive CVA report the highest level of satisfaction with use, but all schools have a substantial percentage of staff – highest in the case of National Challenge schools – who are dissatisfied or very dissatisfied with level of use. Almost 10% of heads are dissatisfied or very dissatisfied with level of use, but generally senior managers are more satisfied than classroom teachers, and more experienced staff are more likely to be satisfied with level of use.

Better understanding increases the utility value of performance data, but there are widespread issues relating to training and professional development: more time to develop better data skills; more one-to-one and school-specific help; more after-school/twilight sessions; better training as part of PGCE programmes; regular in-school forums to establish priorities and to dry-run data techniques; regular checks that interpretations are correct; and a greater use made (in training) of worked examples. A significant portion of staff, including senior and middle managers but mostly classroom teachers, report not having received any data-related training at all during the last five years. Generally, more widespread use, greater understanding and higher satisfaction are linked to more frequent training, and schools with positive CVA do best in all respects.

Most staff try to use pupil performance data in a practical way: to share targets with pupils and parents; to motivate pupils; to identify and evaluate groups for interventions; to compare pupil progress in different subjects; to select mixed ability groups in lessons and/or make 'strategic' seating arrangements within teaching groups; to allow students to evaluate own progress; to differentiate within lessons; to track attendance and punctuality; and to identify aspects of courses with which pupils struggle (or find easy). Schools with high raw attainment but low CVA, and coasting schools, use data least in a practical way, and older teachers do not use pupil data as much to inform how/what they teach. The most popular uses are pupil-focused, rather than teacher-focused or accountability-focused.

Most staff make regular or frequent use of *own pupil data* – class tests and continuous assessment – and most find this *more* useful. Generally, the longer teachers are teaching, the more regularly they use their own pupil data but the less they find such own data 'more useful' than external data. Those who use own pupil data indicate that they use it because: own data is more specific to subjects or topics; it better takes into account student motivation and effort (and personal factors affecting performance); it is more accurate, more consistent, more frequently updated, more immediate, more up-to-date, more user-friendly, more accessible, and easier to interpret.

Data management, analysis and interpretation is seldom widely delegated within schools, and is mostly done by one individual senior member of staff or by *a number of* senior members of staff; for example, only 5% of schools report that pupil performance data is analysed by class teachers and teachers in pastoral teams have little or no involvement in data analysis or data interpretation. The preferred approach overall within the profession is for heads of department to analyse pupil data, and for classroom teachers to interpret it (nearly half of all classroom teachers themselves feel that they should be responsible). Only a quarter of school staff have access to data via RAISEonline and within that, there appears to be a hierarchy of access (with very few classroom teachers having access).

Classroom teachers feel that ranking schools according to performance (and other 'external' reasons) is why the government collects pupil performance data, and there is considerable resentment about this because it is thought the government does not trust teachers to act professionally. There is a clear difference between what staff think are the reasons for collecting pupil performance data and what they think the reasons should be for collecting it: staff think it is collected for *external accountability* purposes, but that it *should be* collected for *internal improvement* purposes.

1. Introduction and background

The development of value-added measures has, by and large, been greeted favourably by teachers…

Over the past decade, various measures for gauging pupil attainment and progress in schools have been introduced in England: from simple threshold measures of raw academic attainment such as the percentage of pupils obtaining a particular set of examination grades,[1] through value-added (VA) models adjusting for prior attainment, to the latest relatively complex contextual value-added (CVA) models which take account of a wide range of factors deemed to be outside the control of schools. The development of value-added measures has, by and large, been greeted favourably by teachers (Saunders & Rudd, 1999) as a response to their call for metrics to be fairer than unadjusted threshold measures. The stated *aim* was to make schools 'data rich' (Miliband, 2003) and to foster a culture of 'intelligent accountability' (Miliband, 2004) among teachers; the implicit *assumption* was that such data can improve the quality of teaching and lead to improved outcomes for pupils.

Since their introduction, both raw attainment and value-added measures have been used to inform and focus school improvement through self-evaluation and pupil target setting, as well as being part of the UK government's accountability agenda for English schools (through the publication of school performance tables, the work of School Improvement Partners and the Ofsted inspection framework). Data has been presented in a variety of incarnations such as Performance and Assessment (PANDA) reports, the Pupil Achievement Tracker (PAT) and most recently via the sophisticated outputs produced by the web-based 'RAISEonline'.[2] Data flows to schools from a variety of sources: the government's Department for Education (DfE); Ofsted, the English schools inspectorate; the Fischer Family Trust's Data Analysis Project (FFT);[3] and through various collaborations such as the London Families and the Lancashire Schools projects. The ability to use performance data is now written into Performance Standards for teachers in England: from trainees seeking Qualified Teacher Status providing evidence that they can use it 'to evaluate the effectiveness of their teaching' (TDA, 2007a: 9), to the recently introduced category of 'Excellent Teacher' being able to use it to 'analyse' and 'evaluate the effectiveness of teaching and learning across the school' (TDA, 2007b; TDA, 2007c, TDA, 2007d: 7).[4]

The assumption by government in encouraging the availability and use of data is that it will improve performance at school, teacher and pupil levels, but this presupposes that school culture around its use can facilitate high-level professional enquiry and engagement, and that adequate management structures exist in schools to facilitate utilisation. Yet good management structures alone are not sufficient: there are other obstacles to the development of data-friendly cultures in schools:

- *the tension inherent in the fact that the same data is used for both improvement-evaluation and accountability-monitoring purposes.* The same yardstick used by teachers to improve their own performance may also be perceived as a stick used to 'beat' them; and
- *data literacy.* The terminology used to facilitate the professional dialogue needed when schools engage with data is based on complex statistical models and carries a context-specific lexicon whose terms and cognates, while being straightforward to those familiar with their provenance, have different shades of meaning in everyday life (Downey & Kelly, 2008, Kelly & Downey, 2007).

[1] Usually the percentage of pupils getting five or more C grades (or better) at GCSE, the school leaving examination taken by all 16-year olds in England.
[2] RAISE is an acronym for 'Reporting and Analysis for Improvement through School Self-Evaluation'.
[3] FFT is an independent (non-profit) registered charity involved in the development of education in England and Wales.
[4] The standards for 'Excellent Teachers' have been subsumed into those required for 'Advanced Skills Teachers' (TDA, 2007e) so that the two highest grades of classroom practitioner are now required to improve the practice of colleagues in the use of data and to extend their own focus beyond their curriculum specialism towards whole-school evaluation.

Alongside teachers themselves, 'data managers' are key to the development of statistical literacy in schools.

Previous research on developing a positive school culture around the use of data, drawing as it does almost exclusively on the practice and views of school *leaders* rather than school *teachers*, has not properly represented data culture as it affects classroom practice in respect of data. It is an under-researched area, yet there are few more important topics in the allied fields of school effectiveness and school improvement than how teachers use data to improve pupil learning and how schools build a supportive culture around this imperative. There are recognised 'top-down' issues regarding data usage[5] in schools (e.g. Stevens *et al.* 2005; Day *et al.*, 2008), but such a perspective must be balanced with the more important 'bottom-up' perspective of teachers. Value-added measures, though fairer, are little understood among teachers who express frustration that their 'good' work is not always reflected in measures of school performance (Bush *et al.*, 2005) and that the proper utilisation of externally supplied data needs both leadership from above and a sense of ownership among classroom users (Kirkup *et al.*, 2005). Previous research also suggests that some of the challenges associated with data usage relate to perceptions of trust, to the fact that the data is sometimes (perceived as) unreliable or untimely, to inherent difficulties in interpreting it for use in classrooms, and to the fact that schools need to be 'ready' (in terms of their developmental maturity) to derive benefit from it.

Alongside teachers themselves, 'data managers' are key to the development of statistical literacy in schools. The role – typically undertaken by a Deputy or an Assistant Head – is viewed by some as valuable in providing tailored outputs that obviate the need to learn complex systems, and by others as adding yet another layer to the data hierarchy (Kirkup *et al.*, 2005). Views and perceptions have been found to vary among managers and subject leaders; an important finding since the 'official' CVA model in England uses prior attainment only in the core subjects of mathematics, science and English as its main independent (predictor) variable.[6] If subject leaders in core subjects sometimes struggle to see the relevance of models, even when they are based on data from their own subject area, how must teachers of non-core subjects feel when the progress of their students is measured using prior attainment in other curriculum areas?

Literature on teacher attitudes to the use of data is sparse, though it is thought to depend on the way the data is presented and managed (Dudley, 1997; 1999a; 1999b): from an action-orientated view aimed at improvement, through passive acceptance/rejection, to active denial. Studies of teacher attitudes to sharing performance data in and between schools (e.g. Saunders, 2000) suggest a range of emotional and intellectual responses as teachers vary in their enthusiasm for the potential of the data to inform their teaching and learning, and in the extent to which they are willing to rely on data as a manifestation of pupils' ability.[7]

[5] In this report, we define 'usage' as *level of* use.

[6] Unlike the DfE/Ofsted CVA models, which exclusively use the results from national tests in English, mathematics and science for their KS2–4 progress indicators, the CVA measures provided by FFT incorporate teacher assessment data from both core *and non-core* subjects.

[7] Saunders (2000) suggests a 2x2 typology: the 'sceptical' view of data, resistant to its literal use but not rejecting it; the 'heuristic' view, perceiving data as valuable and using it to be strategic about pupil learning (but not to make judgements); 'technicist', accepting data at face value and relying on it; 'unengaged', viewing data as simply irrelevant.

2. Sampling and methodology

Sampling thresholds based on CVA were set to include all schools with a significantly high or significantly low score as indicated by the 95% confidence interval used in the 2008 School Performance Tables.[10]

The research was designed around schools with a range of pupil outcome measures in the most recently published (2008) Achievement and Attainment Tables (DCSF, 2008a), focusing both on:

- the ('raw') percentage of students obtaining five or more A*–C grades at GCSE (including English and mathematics); and
- school CVA scores.[8]

The lower sampling threshold for the 'raw' attainment measure was set at the 'National Challenge' floor target of 30% of students obtaining five or more A*–C grades at GCSE (including English and mathematics); the 'raw' upper threshold was set at 60% in line with one of the criteria used in 2007 to determine entry into the category of 'High Performing Specialist School' (Pricewaterhouse Coopers, 2008: 8).[9]

Sampling thresholds based on CVA were set to include all schools with a significantly high or significantly low score as indicated by the 95% confidence interval used in the 2008 School Performance Tables.[10]

Application of these sampling thresholds identified four school types with complementary and contrasting data pictures:

- 'Plus-Plus' (PP) schools in which 60% or more obtained five or more A*–C grades at GCSE (including English and mathematics) AND which had a significantly *positive*[11] school level CVA score (n=317 schools).
- 'Plus-Minus' (PM) schools in which 60% or more obtained five or more A*–C grades at GCSE (including English and mathematics) BUT which had a significantly *negative* school level CVA score (n=59 schools).
- 'Minus-Plus' (MP) schools in which less than 30% of students obtained five or more A*–C grades at GCSE (including English and mathematics) BUT which had a significantly *positive* school level CVA score (n=97 schools).
- 'Minus-Minus' (MM) schools in which less than 30% of students obtained five or more A*–C grades at GCSE (including English and mathematics) AND which had a significantly *negative* school level CVA score (n=194 schools).

The total number of schools identified in these four categories was 667 or just under 22% of the dataset (n=3,060 schools).

In 2008 an additional category of 'coasting' school was announced by Ed Balls, the then Secretary of State for Children, Schools and Families. It received widespread attention in the media although

[8] After excluding special schools, recently closed schools, newly opened schools and others with insufficient data available, the database consisted of 3,060 schools.

[9] This threshold has since been raised to 65% (DCSF, 2008b).

[10] While the practice of applying statistical confidence measures to this type of data is not without its critics – see Gorard (2007) and Hutchison & Schagen (2008) for a flavour of the debate – it is now widely embedded in the presentation of value-added data to schools by the two most widely used sources: DfE/Ofsted via RAISEonline; and data produced by FFT for Local Authorities.

[11] A significantly positive CVA measure is indicated by the lower limit of the 95% confidence interval of the school's CVA score being greater than the national average of 1000; a significantly negative CVA score by the upper limit of the 95% confidence interval of the school's CVA score being less than the national average.

The criteria for identifying coasting schools were more varied and complex than those for identifying National Challenge schools,[12]…

lists of schools were not made public as was the case with National Challenge schools. The criteria for identifying coasting schools were more varied and complex than those for identifying National Challenge schools,[12] but included the following school-level public indicators of performance (Balls, 2008):

- More than 30% of pupils achieving five or more good GCSEs (including English and mathematics) but *unimpressive* overall progress from KS2 to KS4.
- Little or no improvement in progression rates over several years.
- A CVA score significantly below average.

In light of these criteria, we identified a further two school categories:

- 'Coasting on CVA' (CC)[13] schools in which the percentage of students obtaining five or more A*–C GCSE grades (including English and mathematics) was between 30% and 50% (excl)[14] AND which had a significantly negative CVA score (n=394 schools).
- 'Coasting on Trend' (CT) schools in which the percentage of students obtaining five or more A*–C GCSE grades (including English and mathematics) was between 30% and 50% (excl) AND had a downward or static trend in this measure for the four years 2005 to 2008 (n=165 schools).

A final 'other' set of schools was added to the sample:

- 'Other National Challenge' (ON) schools in which less than 30% of students obtained five or more A*–C grades at GCSE (including English and mathematics) with a non-significant school level CVA score (n=157 schools).

This added an additional 716 schools to the sample, giving a total of 1,383 schools, or just over 45% of the dataset (see Figure 1 on page 9).

The 1,383 schools in the sample were contacted by telephone and an email invitation was sent inviting participation in the survey.[15] Twenty-five schools operated a policy of not participating in research, six were in the process of closing down and another six could not be reached by telephone after five attempts, so 1,346 invitations were sent out and these produced (following two reminders) 813 individual teacher responses from 178 different schools.

The final part of the online questionnaire asked participants to indicate their willingness to participate further in the project by leaving contact details. 220 participants (approximately 27%) agreed and a (10%) sample of these was later interviewed.[16]

Table 1 on page 9 gives an overview of the response by school type.

[12] These included the results of Ofsted inspections, evidence of differential effectiveness, and weak monitoring and assessment practices.

[13] We acknowledge the controversial nature of the designation 'coasting', but given the amount of media attention devoted to the identification of schools in both 'National Challenge' and 'Coasting' categories, they exemplify to an extent the tensions inherent in data being used both as a public accountability measure and as a source of evidence for school self-evaluation and improvement.

[14] Although no upper limit on the percentage of students obtaining 5+A*–C GCSE passes (including English and mathematics) was set by the Secretary of State in his criteria for the identification of coasting schools, the 30–50% figure was widely publicised/used in the national news media. See http://www.guardian.co.uk/politics/2008/nov/13/edballs-coasting-schools-gcses.

[15] The email contained a hyperlink to the online questionnaire and a request to the headteacher to make the link available to all members of the school's teaching staff.

[16] The participant quotes in this report come from these interviewees.

Figure 1: School dataset

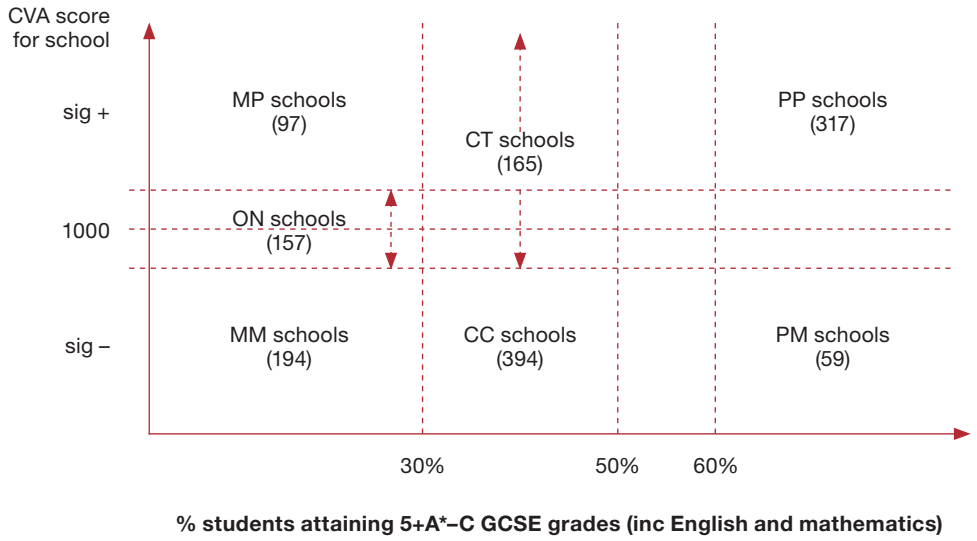


Table 1: Response by school type

School category	No. of invited schools	No. of responding schools	% response	No. of teachers responding	% response of total sample
PP	302	44	14.6	223	27.4
PM	59	11	18.6	60	7.4
MP	90	8	8.9	23	2.8
MM	187	28	15.0	100	12.3
CC	386	51	13.2	253	31.1
CT	164	23	14.0	118	14.5
ON	153	13	8.5	36	4.4
Total	**1,341**	**178**	**13.3%**	**813**	**100.0%**
Others		*26*		*53*	

Response across age, gender and teaching experience[17] was closely aligned with national profiles within the teaching profession. The response across the spread of responsibility in schools, broken down by gender, is shown in Table 2 on page 10. It is worth noting that of the responding males in the sample, 27.7% occupy senior leadership positions (assistant head, deputy head, head) while only 13.5% of responding females do. For the role of school-wide pastoral leader, we see the reverse pattern: 5.5% of responding females occupy this post compared to 2.8% of responding males. This is a marked difference, but again is broadly in line with the national profile.

[17] Half the sample had been teaching in current school for five years or less.

Table 2: Response across age, gender and teaching experience

	Class teacher	Subject leader	School-wide Key Stage leader	School-wide pastoral leader	Senior leadership position (H, DH or AH)	Other	TOTAL	% of total sample
Male	93 (32.2%)	90 (31.3%)	3 (1.0%)	8 (2.8%)	80 (27.7%)	15 (5.2%)	**289** (100%)	35.5%
Female	217 (42.5%)	165 (32.4%)	9 (1.8%)	28 (5.5%)	69 (13.5%)	22 (4.3%)	**510** (100%)	62.7%
Missing							***14***	*1.7%*
Total	**310**	**255**	**12**	**36**	**149**	**37**	**813**	**100%**

3. The extent of use of pupil data

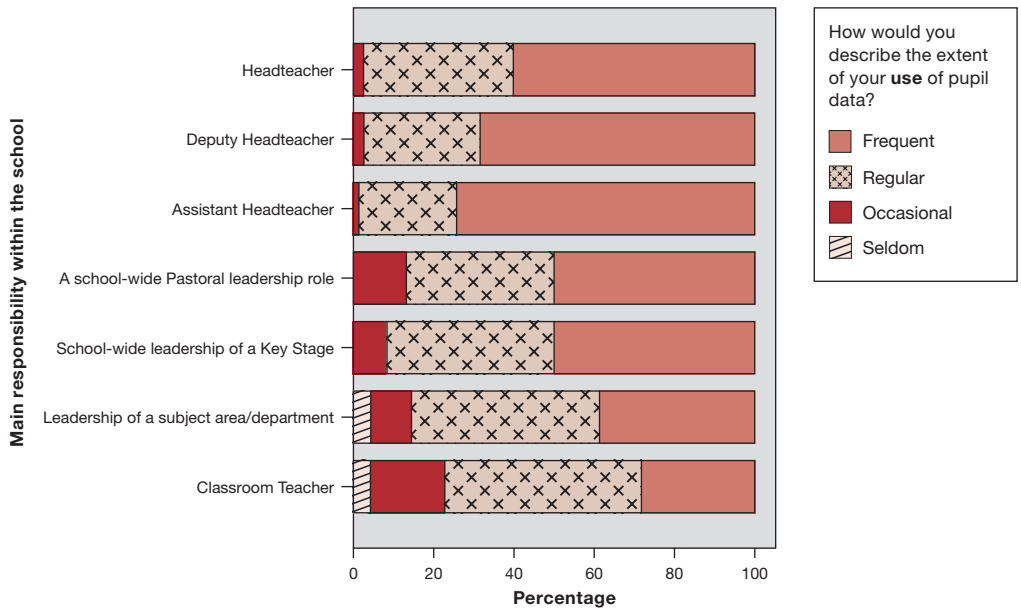
Descriptively, teachers in schools with significantly positive CVA have a modal response of 'frequent' whereas it is 'regular' for classroom teachers in the other school types.

The use of data is widespread across the profession – approximately 85% report using it regularly or more frequently than regularly (see Figure 2 below) – but it is least in use among classroom teachers, and there is a plateau effect at senior level (i.e. use does not increase with seniority within the senior management group (SMG)). Classification tree analysis[18] shows a significant association ($p<0.001$) between staff level of responsibility and frequency of data use. Heads appear to delegate the role of 'data manager' within SMG so that deputies and assistant heads report the highest extent of use.

Overall, schools with significantly positive CVA (PP and MP types) have higher levels of data use; and coasting schools (CC and CT) report significantly less frequent use. There is a significant association ($p<0.026$) between school type and the extent of use of data *by classroom teachers*, which may be indicative of a data culture that places particular value on the role data plays in self-evaluation and improvement. Descriptively, classroom teachers in schools with significantly positive CVA have a modal response of 'frequent' whereas it is 'regular' for teachers in the other school types. Similarly, teachers in schools with high raw attainment but negative CVA (PM type) have the highest proportion of responses in the 'occasional' and 'seldom' categories (27%).

When exploring school type as a moderator of the association between usage and level of responsibility, it becomes clear that *within* high-use school types (PP, MP), it is the assistant heads and those with school-wide pastoral responsibilities that report the highest levels of use, which may suggest greater delegation (but not down to the level of classroom teacher).

Figure 2: Extent of use of pupil data



[18] Outputs were computed using either the 'CHAID' (Chi-square Automatic Interaction Detector) or the 'exhaustive CHAID' algorithm (Kass, 1980).

A classification tree analysis of the moderating effect of responsibility and school type on satisfaction with usage reveals that assistant and deputy heads (the most likely 'data-managers') report the highest levels of satisfaction with use (nearly 90% 'very satisfied' or 'satisfied') and classroom teachers report the lowest levels (60% 'very satisfied' or 'satisfied'). School type is not significant for either of these groups, so in terms of satisfaction with extent of use, classroom teachers are more similar to their counterparts in other schools than they are to their more senior colleagues in the same school.

The spread of data usage across the age range is similar to that across the responsibility range, with newly qualified teachers (NQTs) showing the lowest extent of use. Use grows with length of service, but plateaus at the stage when (typically) senior management roles kick in. There are no significant differences in the use of data across subjects, nor is there a link between gender and usage. It is certainly not the case that data usage is a 'male exercise'.

4. Satisfaction with level of use ('usage')

Suddenly she felt confident and I find that amazing; the confidence that it can give to students.

Although 40% of school staff use data frequently, only 25% are very satisfied with that usage. Schools with a significantly positive CVA report the highest levels of satisfaction with usage; staff in schools with high raw attainment but negative CVA report the lowest levels of satisfaction (and the lowest usage). Generally, heads, deputies and assistant heads are more satisfied with level of use than classroom teachers, although heads are less satisfied than their senior colleagues. Again, gender and age have no effect. School leaders, especially those who are data managers, report facing delicate balancing issues when trying to devolve use to teaching staff:

> *'Some staff are a little worried that schools are – and our school is – becoming very data-driven and that we are forgetting the individual. But I think there is a happy medium and I wouldn't want my school or myself criticised for not providing enough information to staff.'*
>
> Deputy Head and Data Manager, PP school

School type produces significant levels of difference in satisfaction ($p<0.05$) only for heads and middle managers, for whom satisfaction with usage is tied to improving the outcomes and aspirations of pupils. **The first comment below refers to aspirations at the whole school level, while the second comment has tighter focus:**

> *'I find using pupil data in my teaching role very positive. I can see that as I am getting better at dealing with the data, results are improving greatly. I started a couple of years ago and at that time the results were 1% above average; last year it was 14% above average. So it has been hugely rewarding in that sense.'*
>
> Head of Department, CC school

> *'As an assistant headteacher, I think it really allows me to encourage students to consider just how able they are. When I spent some time with this student and we went through all her data and we looked through all her Fischer,[19] she could actually see visually that she was going to get a C grade in most things according to anyone who knew anything about her. Suddenly she felt confident and I find that amazing; the confidence that it can give to students. She went straight off and signed up to do her re-sit module. That's something I couldn't have done 10 years ago and I think that's brilliant. It's very powerful.'*
>
> Assistant Head and Data Manager, CT school

The correlation[20] between satisfaction and reported extent of use (0.539, $p<0.001$) suggests a significant positive association between usage and satisfaction, and analysis adjusting for the moderating effect of level of responsibility supports this finding. The interview data suggests that any tension in the relationship between usage and satisfaction stems from the perception that time spent on data detracts from other crucial elements of teaching. **Each of the following comments, made by participants across the range of positions of responsibility, refer to general use of a wide range of data types:**

> *'It takes away from the teaching. It would be better if students received a more rounded education. Now it is all about results and performance.'*
>
> Head of Department (science), CC school

[19] The Assistant Head is referring to FFT pupil estimate data which gives an indication of potential performance of students based on outcomes achieved by similar students in the previous year.

[20] Spearman's rank correlation coefficient (rho) was used.

I disagree that we should be spending so much time analysing data … to look at underachievement or overachievement.

'I disagree that we should be spending so much time analysing data … to look at underachievement or overachievement. You're spending a lot of time looking at the data and not enough time in the corridor checking what the children are doing on a day-to-day basis.'

Deputy Headteacher (and Data Manager), PP school

'It's time consuming…. There's a lot of data to go through. I don't know whether there is a novelty value in having all this stuff. We will get to a point where you actually become flooded with it. And I have had a conversation with one of the [Local] Authority data managers who said: 'because you've got it, use it'.'

School-wide pastoral leader (and SENCO), CC school

'That's the only major negative aspect of it I can see: it's easy to become too focused on the numbers and forget about the student themselves. My school loves it; absolutely adores it. … Still we have issues occasionally with the school being too data-focused and not taking everything into account; not taking a holistic view of what's going on.'

Classroom teacher (and Union Rep), CC school

Even data managers express frustration at the breadth and scale of the data and potential conflicts of purpose, particularly when school-level analysis by external agencies is given precedence over more fine-grained, pupil-level analysis:

'I cannot see how every single year, year-on-year, we can exceed our targets. It's nonsensical and it takes you away from the pupil level data, which should be what we're all about. When you have got to have SIP visits and have the data ready for that and you have got to do all of these things it takes you away from what you want to do, which is get the students the best grades they can possibly get. The problem is that you have no choice. You feel very much that things are imposed, and that's against your better judgement, your professional knowledge and your knowledge of the students.'

Assistant Head (and Data Manager), CT school

5. Confidence in skills to access, utilise and interpret data

There is no significant difference between school types, and classroom teachers and heads of department are on average only slightly less confident about their skills than those in other responsibility categories.

A large proportion of school staff (88%) report being confident with their skills to access, utilise and interpret pupil performance data. There is no significant difference between school types, and classroom teachers and heads of department are on average only slightly less confident about their skills than those in other responsibility categories. However, there is a significant difference in skills confidence depending on length of service and age: those in current post for less than 10 years and those in current post for longer than 25 years (but without senior management roles) are significantly less confident. Those lacking confidence in their own skills report:

- Technical/software aspects of processing and interpretation: there were repeated cries for 'someone to show me'.
- Frequent calls for more and better refresher/in-service training among those who have skills but lack confidence.
- Lack of training in the interpretation of data, particularly regarding CVA.
- Lack of time to develop better skills: it is widely accepted that greater understanding increases the usefulness of data for target-setting.
- Concerns that the available data lacks application to *individual* pupils and that there are problems regarding the aggregation of data.
- The jargon and acronyms associated with the field.
- Lack of help for those using RAISEonline and SIMS.[21]
- Linking data with aptitude, intervention and classroom practice.
- Lack of familiarity with what is available so that informed choices can be made as to the utility value of the various data sources.
- The tension between the metrics being too crude on the one hand and too complex on the other.
- Concerns about school size and subject-specific factors.

And in terms of *how* teachers would like their skills developed and improved, they suggested:

- More after-school/twilight sessions.
- More one-to-one help.
- More school-specific, in-school and subject-specific training, but if need be, training in local centres for generic aspects of data utilisation.
- NQTs are struggling to get on board and to keep up: data utilisation should form a larger part of initial teacher training courses.
- There is little resistance to data use among teachers, but there is a widespread perception that teachers lack opportunities to avail of training/updating.

[21] SIMS is an acronym for Schools Information Management System. For more information, see http://www.capitaes.co.uk/SIMS/sims.asp

- There should be regular in-school forums to establish priorities and update staff once skills are acquired.
- There should be regular opportunities to dry run/practise data techniques, and there should be a check that interpretations are correct through a greater use of worked examples in training.
- Policy makers should 'stop moving the goalposts'.

The issue of 'moving goalposts' was captured succinctly by the following interviewee, **who refers to data designed for both school level target setting and whole school evaluation**:

> *'I find it difficult when you have data sets, for example FFT, that are constantly changing or adapting, and when you can't anticipate what that change is going to be. For example CVA: when you can't calculate something because they are going to change their calculation year-on-year, that can be incredibly frustrating.'*
>
> Assistant Head (and Data Manager), CT school

6. Using pupil performance data to inform teaching and management

The most popular uses are pupil-focused, rather than teacher-focused or accountability-focused: to evaluate pupil performance and to set targets for pupils.

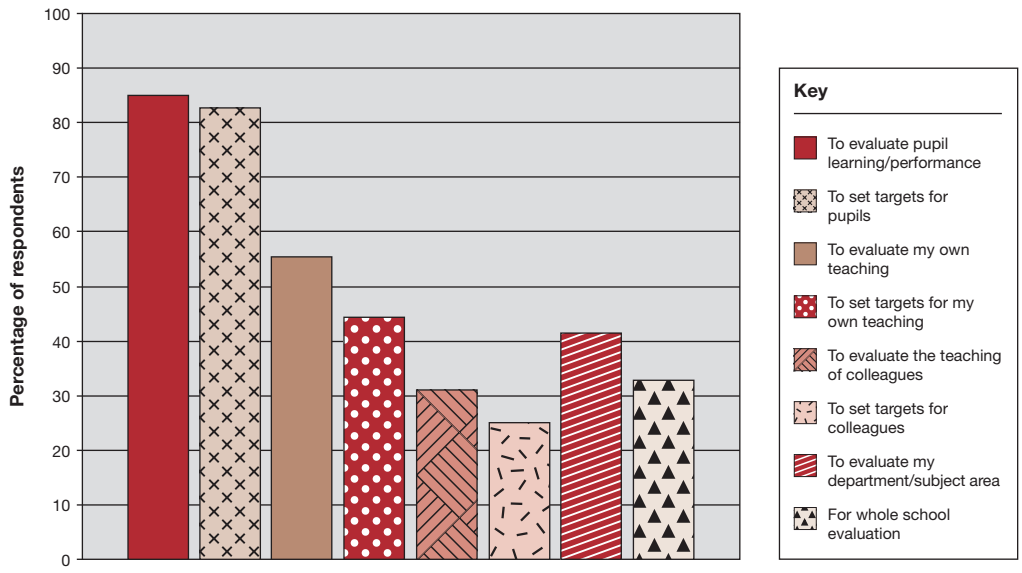
Most school staff (95%) report using pupil performance data in a practical way: to inform teaching and management. PM schools and coasting schools use data least in this way; assistant heads and Key Stage leaders use it most widely (in a practical way); older teachers generally use it less than younger teachers to inform how and what they teach.

Figure 3 (below) shows what staff do with pupil performance data. The most popular uses are pupil-focused, rather than teacher-focused or accountability-focused: *to evaluate pupil performance and to set targets for pupils*. About 50% use data *to evaluate own teaching* and a lower percentage (42%) use it *to set targets for own teaching.*

If use of data is examined in relation to school type, a similar response pattern is seen across the sample:

- The percentage of staff using pupil performance data to *evaluate pupil learning* in schools with low raw attainment and negative CVA (MM school type) is higher than in other school types. In MM schools there is also a significantly higher percentage (60%) reporting that they use pupil performance data *to set targets for own teaching.*
- A significantly lower percentage (39%) of staff in MP schools report using data *to evaluate own teaching* (in most other schools this is around 60%).

Figure 3: Main use of pupil performance data



Data does have a very positive effect on students' learning…

- In 'other' National Challenge schools (ON), pupil performance data is more often reported to be used *to set targets for colleagues* (42%) than in other schools (20–30%).
- In PP schools, using data to *evaluate own subject area* is more often indicated as a use.

The response pattern for the use of pupil data *for whole school evaluation* is varied: schools with low raw attainment but positive CVA scores (MP) have the highest such use (50%); coasting schools the lowest (25%). If use of data is examined in relation to level of responsibility in school, the response patterns are quite varied: at all responsibility levels, large percentages of staff report that they use data *to evaluate pupil learning and performance*, and *to set targets for pupils.*

> *'Data does have a very positive effect on students' learning… You can identify people who are just cruising and could do better (and you know that they could) so you can identify them easier. We are focusing on identifying those children who need extra time and extra resources to achieve the school targets.'*
>
> Classroom teacher (mathematics), PP school

> *'You become much more effective, and awareness is much more acute. There is no room for guess work now because you've got the data… It pinpoints exactly where the kids are. And I mean, you can then go and see what the kids [are] doing. What's the problem? Why is it happening? It's those sorts of conversations that you begin to have. It is transforming. Everything is moving forward and the data is, if you like, underpinning all that.'*
>
> School wide pastoral leader (and SENCO), CC school

Using **a range of evaluation and tracking** data, **at the pupil and pupil group level**, *to evaluate own teaching* and *to set targets for own teaching* is reported in larger percentages by deputies and assistant heads, possibly because of their frequently reported school-wide involvement with data analysis and interpretation, which they then can then apply to their own practice.

Using **a similar range of pupil and pupil group level** data to evaluate the teaching *of colleagues* and to set targets *for colleagues* is (unsurprisingly) reported much more by those with a senior leadership/management role, and department leaders use pupil data for these reasons much more often than classroom teachers.

> *'I'll target all the borderlines and look at people who are below target or below FFT(D) in terms of modular re-sits or redoing coursework. And also when it comes to analysing results, looking at how individual teachers have been performing and whether they need any help.'*
>
> Head of Department (science), CC school

> *'I agree very strongly with regular monitoring and comparing against targets. We need to look at it class-wise and teacher by teacher. There are teachers who are consistently overachieving with particular groups of students. We need to look at what they are doing so that we can spread it wider. And if there are teachers where groups of pupils consistently underachieve, then we need to make sure we put the support in place to make sure that it doesn't happen again. So it is a performance-management tool for staff as well.'*
>
> School-wide pastoral leader (and former Assistant Head), MM school

And if we identify that one practitioner is stronger on a certain topic or area, then we team-teach to share that good practice.

> *'It allows me to monitor the effectiveness of a team of staff to see how different teaching styles impact on results. And if we identify that one practitioner is stronger on a certain topic or area, then we team-teach to share that good practice.'*
>
> Head of Department, PP school

Generally, there was a similar pattern of data usage across all subjects and across length of teaching career, though there was a significantly lower use of data *to set own teaching targets* among NQTs and those with one to five years' teaching experience.

Those who use pupil data to inform teaching/management indicated that they were also using it to:

- share targets and current working levels *with pupils and parents*
- motivate pupils
- identify and evaluate groups for interventions or make plans for underachieving pupils, pupils with English as an Additional Language, pupils with special needs, gifted and talented pupils, and pupils from ethnic backgrounds
- track pupils (especially re attendance and punctuality) and write student references
- select mixed ability groups and/or make 'strategic' seating arrangements within teaching groups
- differentiate within lessons
- identify aspects of courses with which pupils struggle (or find easy).

7. How school staff rate their own understanding of pupil performance data

We can track our pupils easier as mathematicians than say history [teachers] because of the nature of our subject.

Teachers generally rate their understanding of pupil attainment data as good: 75% rate it 'good' or 'very good', and only a very small percentage (5%) rate it 'poor' or 'very poor'. When we look at how level of understanding varies across school type, we see that staff in PM and coasting schools rate their understanding lower than other school types. There are significant differences between levels of understanding across the range of responsibility in schools (see Figure 4 on page 21). Essentially, (self-rating of) understanding increases with role seniority – on average 60% of classroom teachers, 73% of heads of department and around 90% of senior management report a 'good' or 'very good' level of understanding – although there is a reversal between deputies and heads (and a dip for pastoral leaders), which may be explained by the fact that deputies are more often the 'gatekeepers' (i.e. those charged in the first instance with using it on behalf of the school) of pupil performance data.

There is no significant variation in understanding between male and female teachers or between full-time and part-time staff, and there are no significant differences across subjects after adjusting for level of responsibility, though a number of interviewees seem to perpetuate stereotypes based on the subject background:

> *'We can track our pupils easier as mathematicians than say history [teachers] because of the nature of our subject. Also, because we are not afraid of data. Most other teachers are anxious about the whole thing because they don't actually understand the numbers and yet they have the same targets. The fact that we are mathematicians makes it slightly different. We are more comfortable with it. Numbers are better for me. I think they are more objective.'*
>
> Classroom teacher, PP School, expressing a 'technicist' view

> *'If you speak to science and maths teachers they have always been, because of the nature of their subjects probably, a little bit better at doing data analysis and identifying an intervention.'*
>
> Head of Department (science), CC school

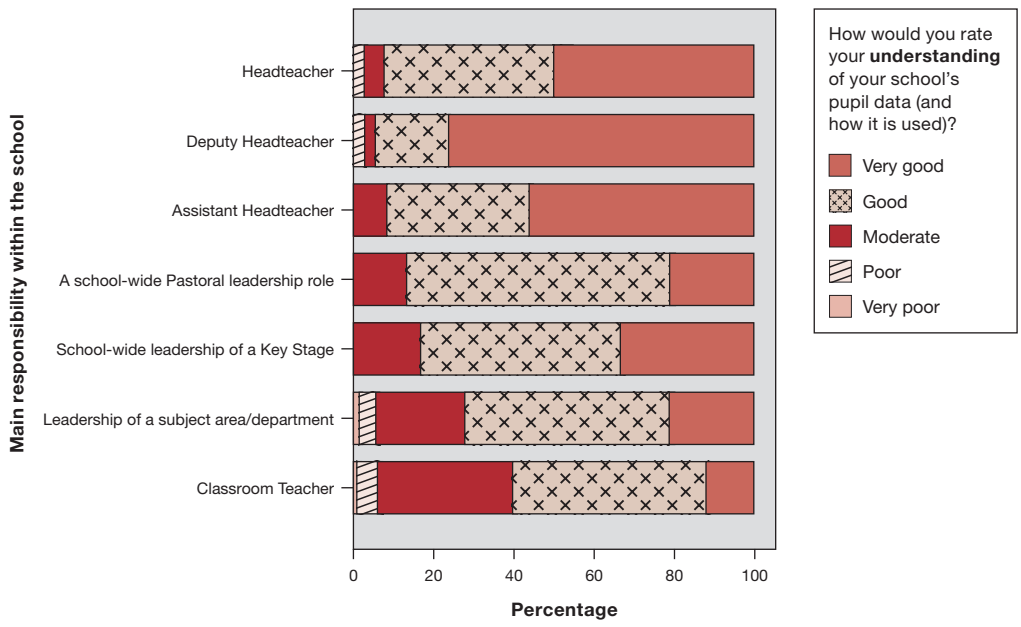
> *'I'm an English teacher and the thought of using data ten years ago was horrific because my brain switches off with numbers, but the school has had such a positive attitude to it and has shown me the difference it can make, the impact it can have and makes it easy for me to access it.'*
>
> Advanced Skills Teacher (English), PM school

The interviewees provide an insight into the complexity of the association between subject specialism and perceived data literacy, especially where teachers take a 'provisional' rather than 'literal' approach to data as a manifestation of pupils' ability:

> *'I don't know whether teachers in other subjects (like science and maths) feel that standardised tests give a more accurate picture, but in English, even a verbal reasoning test doesn't take you very far, because you need a bit of hard graft aswell – how clever the child is, is a very small part of the story because they need to be willing to apply themselves and draft and redraft their writing, and that is not measured by the tests.'*
>
> Classroom teacher (English), CC school

One of the situations that we get regularly is new teachers struggling to understand (a) what the data is for and (b) what the data is telling them.

Figure 4: Self-reported level of understanding of data



NQTs and teachers with one to five years of experience have the lowest reported levels of understanding of pupil performance data, which when taken together with other findings, may be indicative of minimal coverage of 'data analysis' content in initial teacher training courses.

> *'One of the situations that we get regularly is new teachers struggling to understand (a) what the data is for and (b) what the data is telling them. That can be a big issue because sometimes [school leaders] just expect teachers to handle the numbers thrown at them whereas they're not always sure what the numbers are telling them. It's a lack of training, not just in the school but also from a PGCE point of view. Obviously the main thing in the PGCE[22] is getting you into the classroom and getting you teaching, but they need to teach you all aspects [of school life] and data is one of the bigger ones now. This should be approached at a much earlier point of the training.'*
>
> Classroom teacher (also Union Rep), CC school

> *'I don't think we are supporting staff with training quickly enough … I feel that more training is needed for that and also that it should be part of teacher training. Because it isn't, either at PGCE or at NQT.'*
>
> School-wide pastoral leader, MM school

Staff *satisfaction with* level of understanding across school type and across the responsibility range follows the same pattern as level of understanding: schools and staff that report higher/lower *levels of understanding* also report higher/lower *levels of satisfaction* with understanding. Generally,

[22] The 'Post Graduate Certificate in Education' (PGCE) is the main teaching qualification in England. It is generally awarded after a one year full-time (or, rarely, a two year part-time) initial teacher training course.

I just wish that there was a bit more understanding about what the data actually shows…

15–20% of staff are 'dissatisfied' or 'very dissatisfied' with their level of understanding: 7–9% of senior leaders, 13% of subject leaders, 17% of Key Stage leaders and 18% of classroom teachers. **The following comment, referring to data used for both target setting and evaluation purposes, is a plea for greater understanding of the 'provisional' rather than 'literal' nature of data, from all stakeholders within and outside the school. It ends with a positive reflection on the way such understanding can develop within a school, even one with a challenging data profile**:

> *'I just wish that there was a bit more understanding about what the data actually shows, and the limitations of the data aswell because there is more to a child than simply his test results and I think with RAISE, FFT etc., we need to be taking that into account. … But we are now getting more sound about the way we set targets and I think there is a [growing] understanding amongst staff about how targets are set and what those actually mean.'*
>
> School-wide pastoral leader (and former Assistant Headteacher), MM school

8. Training and continuing professional development

Since these schools have higher than average CVA values, it suggests that higher use, understanding and satisfaction may be linked to more frequent training.

Overall, about 40% of school staff receive training/continuing professional development (CPD) in the area of data utilisation and interpretation at least annually. For another 40%, this is less frequently than annually and 18% have never received any training. Relative to other feedback in this survey and given the high volume of CPD in schools generally, this is not a positive picture. In terms of school type, staff in MP schools indicate a significantly more frequent pattern of training than staff in other schools, which matches the previously seen higher levels of use and *understanding* in MP schools, and also their *satisfaction* with level of understanding. Since these schools have higher than average CVA values, it suggests that higher use, understanding and satisfaction may be linked to more frequent training. Generally, staff in senior roles report more frequent CPD (assistant heads report the highest levels of training with more than 60% having received training annually or more frequently than annually) while classroom teachers and department heads report the lowest frequency of CPD (and the highest levels of never having received training). Interestingly, 11% of heads, 8% of deputy and assistant heads, 18% of middle managers and 27% of teachers report not having had any training over the past five years.

There is a significant association ($p<0.001$) between reported frequency of training and confidence in accessing, utilising and interpreting data, with a very clear drop in confidence among those who report not having received training at any time during the last five years. The association between confidence and frequency of training is potentially moderated by experience (in terms of length of service), so this additional factor was incorporated into the analysis. Although the association between length of service as a teacher and confidence in handling data is not itself significant ($p>0.4$), it seems that length of service acts as a moderating variable for the impact of frequency of training on confidence, although this is to some extent confounded by position of responsibility. The analysis shows that the impact of recent training, however infrequent, is appreciable, regardless of experience, and is slightly greater for those who are at an earlier stage in their teaching careers.

- *For classroom teachers*, there is an association between confidence and frequency of training ($p<0.1$). Analysis suggests that a way to raise confidence in data handling skills among classroom teachers is to receive some form of training, however infrequent.
- Frequency of training *for middle managers* has a strong association with confidence, which is almost certainly due to the additional responsibilities expected of teachers in roles like Head of Department. (A similar analysis for staff with school-wide Key Stage or pastoral responsibilities gives a non-significant association between frequency of training and confidence.) Although the proportion of Heads of Department who report not having received any training during the last five years was only 15% of the total, nearly half of those reported having no confidence in their skills to handle data.
- While the proportion of senior managers not having received training during the last five years was only 7% of the total, they reported significantly lower confidence ($p<0.001$) in their ability to handle data. Senior leaders are more likely than (say) classroom teachers to be able to arrange their own CPD, so it is unclear why members of this group, who report some of the highest levels of data use, should not be more engaged in training, though data from the interviews suggests it may be because they consider the training to be inappropriate or inadequate.

I know that somebody in my department has been sent on training, so I don't think the school is deliberately keeping this stuff secret…

The association between understanding (and satisfaction with understanding) and frequency of training is found to be moderated by the level of responsibility. Senior leaders divide into three significantly different groups ($p<0.001$): those reporting *annual* or *more frequent than annual* training were associated with the greatest level of understanding; those reporting *less frequent than annual* training gave the next highest level of reported understanding; and those reporting *not having received any training during the last five years* reported the lowest levels of understanding. A similar pattern was observed among middle managers, those with other whole-school responsibilities and classroom teachers. More detailed analysis, additionally accounting for school type, reveals that *for classroom teachers* the key appears to be receiving training on *at least* an annual basis to improve understanding and satisfaction with level of understanding; for those in middle or senior leadership positions, *any* frequency of training makes a significant impact on levels of satisfaction with their understanding of data.

For many, understanding complex statistical measures such as CVA requires considerable (in their view) effort to get beyond the 'black box' and to take ownership of the information in order to appreciate the contribution that data can make to professional practice:

> *'I know that somebody in my department has been sent on training, so I don't think the school is deliberately keeping this stuff secret, but I think it is quite hard work for teachers to be informed about the statistics and how they are created. And the other thing is: do we really have any influence or are these things put on us from the highest level? That is a frustration really.'*
>
> Classroom teacher (English), CC school

One interviewee described how the interplay of training and actual access to data is crucial to developing a school-wide approach:

> *'We did a lot of training last year with Heads of Department and Heads of Year, who have now trained Year Tutors… I think it is really important that we try to get absolutely every member of staff to be aware of how powerful data can be, and work with students on it. So yes, we've done a lot of training and we've spent a lot of time [on it], but really it's getting the data out there. There is no point in the data sitting on my desk. It's got to be out there with the students.'*
>
> Assistant Head (and Data Manager), CT school

9. Own sources of pupil performance data

Teachers of mathematics, science and languages make greater use of own pupil data than teachers of other subjects, as do teachers of pupils with specific learning difficulties.

Most staff make 'regular' or 'frequent' use of their own pupil data, and half of all staff find it more useful than external/official pupil performance data. A further 47% find their own data *as useful* as external data, so viewing own sources of data as more or equally useful is almost universal across the profession. This is a significant verdict on how teachers perceive the utility value of 'official' data and is a clear challenge for policy makers: to raise perception and levels of use for official data and to create a 'mixed economy' of data sources.

Senior management personnel, especially deputy heads, report a higher level of use of own data. Headteachers, possibly because they deal more with external sources of pupil data than other staff, and school-wide pastoral personnel, report the least frequent use. Teachers of mathematics, science and languages make greater use of own pupil data than teachers of other subjects, as do teachers of pupils with specific learning difficulties.

The longer teachers have been in the profession, the more frequently and regularly they use their own data, but curiously, the less they find own data 'more useful'. The pattern is the same for length of time teaching *in current school*, which suggests that more experienced teachers use their own data, but see it as only part of the picture as they get more familiar with alternative sources. Conversely, teachers with less experience, although they report making less use of their own data, claim more often that they find that data more useful.

Own data is used in a variety of ways and for a variety of reasons:

- Own data is more specific to subject and topics within subjects.
- Own data better takes into account student motivation and effort, and personal factors affecting performance.
- External data is about targets, whereas own pupil data is about where students are *with regard to* targets, making it easier to track progress and spot trends.
- Staff trust own data more than computer-generated data, believing it to be more accurate, more realistic and/or less inconsistent.
- Own pupil data is more immediate, up-to-date, user-friendly, accessible, and easier to adapt and interpret.
- External data does not take account of the *level of effort* pupils put in to their work.
- The removal of SATS[23] national tests suggests to many teachers that their judgements are now acknowledged as being of greater value than external data, enabling teachers to plan and differentiate lessons effectively and plan learning for individual students.
- External data cannot tell teachers what areas to concentrate on, and does not take into account cultural experience, behaviour or attitude to learning.
- Own data is more useful for tracking purposes; external data is more useful for standardisation, wider comparisons and setting expectations.
- There is a lack of confidence among secondary school staff regarding the quality of official assessment in primary schools, how it is performed and how pupils are 'prepped'. It is thought to create unreliable starting points for external data sources.

[23] 'Statutory Assessment Tests' or more formally 'National Curriculum Teacher Assessments and Key Stage Tests'.

- There is widespread dissatisfaction among non-core subject teachers that assessment in core subjects (mathematics, English and science) is used as a basis for predicting attainment in non-core subjects.
- Some teachers feel that external data is more useful for high achieving schools.
- Many staff say that both types of data (own and external) are complementary, feeding into each other, and that *both* have value.

10. The management, analysis and interpretation of data – who does what and who should do what in schools

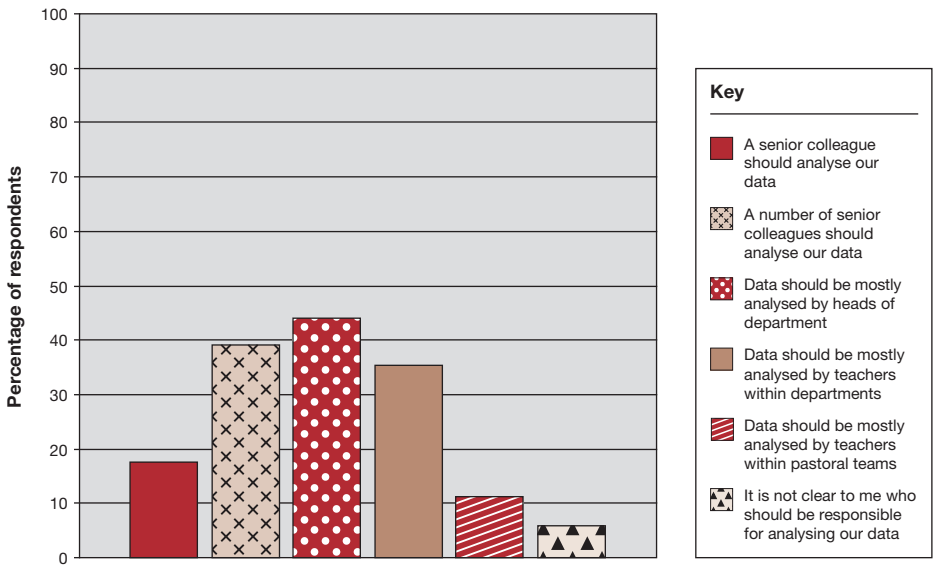
Generally, the number of teachers involved in data interpretation is twice the number involved in data analysis across all school types.

Data *management* is mostly done by one senior colleague (59%) or by a *number of* senior colleagues (28%). It is less often delegated than data *analysis* and data *interpretation*. There are no significant differences in who *manages* pupil data across the different school types, though in terms of data *analysis*, coasting schools report a significantly lower involvement of senior staff and PM schools the greatest engagement of classroom teachers. Generally, the number of teachers involved in data *interpretation* is twice the number involved in data *analysis* across all school types. In schools with the best raw scores, data *interpretation* is most often carried out by *a number of* senior colleagues, in coasting schools, it is done by *one* senior colleague and in all school types, staff in pastoral teams have little involvement with data analysis and interpretation.

Figure 5 (below) shows who staff think *should* be responsible for data *analysis*. The response for data *interpretation* is almost identical. The overall preferred approach – who *should* do it – is for heads of department or for a team of senior colleagues to analyse and interpret the data. Less than one fifth feel that data should be analysed and interpreted (not shown) by an individual senior colleague like a data manager or a deputy head, and more than one third feel that data should be analysed and interpreted (not shown) by classroom teachers within departments.

There is some variation between school types. In most schools, the preferred option is for heads of departments to analyse and interpret data, but in MP schools the preferred approach is for a number of senior colleagues to do it; and ON schools prefer classroom teachers to do it.

Figure 5: Preferred approaches to analysing pupil attainment data



If I were in charge I would make sure that [teachers] could actually understand what is going on, so that they would need training rather than just being told that these are the scores you have to achieve.

There are no significant differences across the responsibility range, though a strong opinion exists among Key Stage managers that classroom teachers (in both department and pastoral groups) should be the ones to *analyse* the data. One of the interviewees was unequivocal about the level of challenge that such a devolved approach can present:

> *'At the moment, teachers and heads of department are given a lot of raw data, which is fine. And [for] people like me who are scientists or mathematicians and the like, it's not a problem.. But there are a lot of people in the school who aren't like that and would like to see much more of the analysis done centrally and then passed to us to deal with the teaching and learning consequences. But the fact is that people are finding it difficult … getting to grips with the data, rather than the actual information that the data holds. There is a big difference between data and information and I don't think we have entirely grasped that.'*
>
> School-wide pastoral leader, MM school

The preferred approach to data *interpretation* differs from the preferred approach to data *analysis* in the extent to which teachers are considered to be the group that *should be* responsible: there is an even greater expectation that teachers should be responsible for data *interpretation*. It is also striking that most 'responsibility categories' prefer that *they themselves* are responsible for interpreting their school's pupil performance data, but they don't feel that way about data analysis. Most significantly perhaps, nearly half of all classroom teachers feel that it is teachers themselves who should be responsible.

> *'If I were in charge I would make sure that [teachers] could actually understand what is going on, so that they would need training rather than just being told that these are the scores you have to achieve.'*
>
> Classroom teacher (mathematics), PP school

There are no significant differences in who should *analyse* or *interpret* data across the range of subjects or across the age/experience range, though NQTs have a strong preference for it being done by classroom teachers. Additionally, there was some concern expressed about pupils' and parents' lack of engagement with, and lack of access to, pupil attainment data:

> *'Re parents: I think their involvement in understanding the data collected about their children and how they can assist with the progress of their child is crucial. Access to data online might be useful here, with an improved dialogue at secondary level; i.e. a partnership approach.'*
>
> [Comment on questionnaire]

> *'It seems to me that we hold most of the pupil data – say 60% of it – and allow the kids to see maybe 20–30%, but nobody else. Maybe a social worker or external agencies – they might get to see some of it – but we don't share that much with parents, apart from maybe one grade in end-of-year reports and at parents' evenings.'*
>
> [Comment on questionnaire]

11. Availability of pupil performance data

The headteacher is very [pause] well, he likes to hold on to these things, you know.

Pupil performance data is widely and readily available in schools. Almost 60% of staff can access pupil data *and* carry out own analysis and interpretation; 20% indicate that it is accessible only to staff with a management position in the school or is given to others (by management) pre-interpreted.

In terms of school type, data is least widely available in coasting schools and schools with negative CVA (PM and MM). Teachers can access data *and* carry out their own analysis and interpretation most in MP schools, and least in coasting schools. All school types give pre-interpreted data to teachers in a top-down way, which is the cause of some frustration, **particularly with pupil estimates data designed to inform individual and group level target setting**:

> *'The headteacher is very [pause] well, he likes to hold on to these things, you know. He likes his secrets and data is one of his things. That's what he does. So sometimes it's difficult to find out where all the data has come from; what the background is. He is giving me a figure that a kid is to get by the end of the year. Well, where have you got that from? What have you included and what have you not?'*
>
> Classroom teacher (and Union Rep), CC school

However, there are practical ways to change data culture in schools and to facilitate a more devolved approach:

> *'I have suggested this year that we put the information onto flash drives so that instead of constantly producing paper copies for people, we can actually hand things out to heads of department. The whole approach has been centred around sharing the data so that people are aware of it. It previously used to be held by one person who would tell you the one fact you needed to know; you know, the one target you were aiming for as a department.'*
>
> Assistant Head (and Data Manager), CT school

Data is least widely available to classroom teachers and heads of department, and most widely available to deputies, assistant heads and Key Stage managers. Generally, the more senior the role, the greater the access to data and the greater the facility to carry out own analysis and interpretation. Classroom teachers and heads – perhaps unsurprisingly, but for different reasons – are given pre-interpreted data more than other staff. Classroom teachers and heads of department are also the categories most likely to be able to access *only own subject data*, which may be important in light of a range of international school effectiveness research studies, which show that even after adjusting for prior attainment and a range of contextual factors, most of the variation in pupil outcomes lies *within* (rather than *between*) schools.[24]

[24] For an overview of insights gained from school effectiveness research, see for example Sammons (2007).

12. Access to RAISEonline

Generally, with the exception of pastoral leaders, senior staff in schools have greater access to RAISEonline so there appears to be (not for the first time in this research) a hierarchy of access to data.

Only 27% of staff claim to have access to pupil data via RAISEonline. Staff in MP schools have greatest access (which coincides with them also reporting greatest use, best understanding of pupil data and most frequent training). Generally, with the exception of pastoral leaders, senior staff in schools have greater access to RAISEonline so there appears to be (not for the first time in this research) a hierarchy of access to data. The lack of access among classroom teachers (95% have none!) to this most common 'external' source of pupil performance data is extreme,[25] and perhaps not helped by the fact that Ofsted/DfE (formerly DCSF) (who are responsible for RAISEonline) appear less than committed to a policy of providing direct access for teachers:

> *'Access details have been sent to the headteacher of all maintained primary and secondary schools. Ofsted/DfE have provided schools with an administrator account which allows them to create further users for their school. Please contact the headteacher for your school to identify who has been assigned the RAISEonline administrator role. The creation of additional accounts is the responsibility of the school and Ofsted/DfE will not be able to respond to direct requests for access.'*[26]

[25] This is likely to be a mix of those who have no access and those who have access but who are unaware of it.
[26] Source: https://www.raiseonline.org/helpLoggingIn.aspx (accessed on 03.12.09)

13. Rationale for collecting performance data – what it is and what it should be

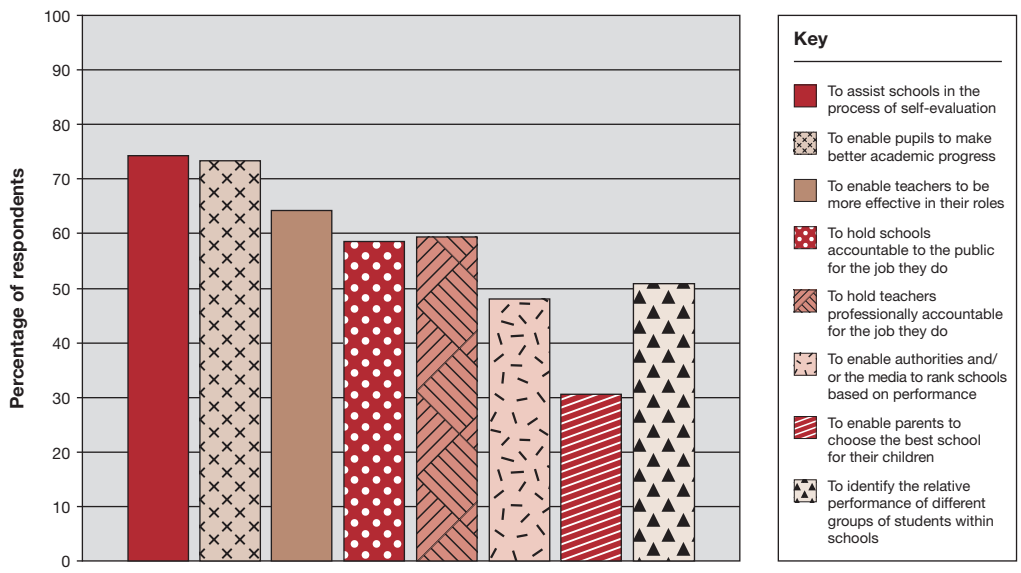
The two reasons most often chosen as current reasons for collecting pupil performance data are 'to assist schools in the process of self-evaluation' and 'to enable pupils to make better academic progress'…

Staff were asked to choose (from eight options) what they felt were the current reasons for collecting pupil performance data, and in a supplementary question, what they felt *should* be the reasons for collecting it. Figure 6 (below) shows the range of responses: the first four (on the left) are reasons *internal* to the school; the second set of four (on the right) are reasons *external* to the school.

The two reasons most often chosen as current reasons for collecting pupil performance data are *'to assist schools in the process of self-evaluation'* and *'to enable pupils to make better academic progress'*, but more importantly, it is noticeable that internal reasons are more often chosen than external reasons. There is little to differentiate by school type here and there is no significant relationship between what school staff believe are the current reasons for collecting data and length of time teaching, though NQTs more often feel that the purpose is *'to enable parents to choose the best school for their children'*. Deputies and Key Stage leaders also stand out: 100% of the former feel that pupil performance data is collected 'to assist schools in the process of self-evaluation'; 100% of the latter think that it is done *'to enable students to make better progress'*. By comparison, classroom teachers and heads of department feel that *'ranking schools according to performance'* is the main reason for collecting the data.

There is considerable negative feeling around current reasons for collecting pupil performance data, which includes: 'to tick a box' and 'to satisfy Ofsted and statisticians'; to be 'used as a

Figure 6: Main reasons currently for collecting pupil attainment data, in opinion of respondents



There is considerable negative feeling around current reasons for collecting pupil performance data…

stick to beat teachers and schools'; to set 'ever-increasing targets'; and to 'encourage absurd competition' between schools. Others think that official pupil performance data lacks reliability ('teachers often enter the same grade as last time'), that less well-off pupils are disadvantaged by it, that it is done because 'the government doesn't trust teachers to be professional', that 'parents don't understand data well enough anyway to be able use it to choose the best school' and that over-reliance on it detracts from other more important issues in education ('turning schools into factories in a forlorn attempt to measure the immeasurable'):[27]

> *'I don't think the children end up being better mathematicians because their grades are better. They just know the techniques, and techniques are easily forgotten. Data helps to achieve the school target – we all play this game – but I think the children end up not being as good at maths as they could have been. I actually think that ten years ago, my students were better mathematicians, when we didn't use so much data.'*
>
> Classroom teacher (mathematics), PP school, **referring to data used to inform target setting**

Others suggested that teachers play games with data and that the system rewards such behaviour. Teachers say they are a 'compliant profession', but reluctantly so in the case of data usage because there are fundamental issues that are left unclear and unresolved:

> *'You do feel that it is very much a political game and you are having to put a spin on your data and use it to show the school in the best light, and really sometimes to me that works against trying to find where you need to develop your capacity to improve.'*
>
> Assistant Head (and Data Manager), CT school, **referring to school level evaluation data**

However, many teachers have positive reasons for collecting pupil performance data:

> *'If we didn't have to [collect data] it would give us a bit more time, but for the majority of students – I'd say probably for about 70% of them – it's vital. It's really important information and they pay attention to it.'*
>
> Classroom teacher (and Union Rep), CC school

> *'In terms of prior attainment data I find it very useful. I use internally set targets as well to set aspirational challenges for my students. I think that the Fischer data is very useful in setting a baseline, and obviously there's your own marking that you do, so there's your own setting of targets and trying to get students to build upon their levels as they make progress towards GCSE. In general, I find it very helpful.'*
>
> Assistant Head (and Data Manager), CT school

And where teachers are critical, they are pragmatic rather than resentful, **as the following comments, referring to evaluation data, illustrate**:

> *'I do not need external reward to make me feel good (or bad) about how well I am doing. I can evaluate this for myself and data gathering assists this process.'* [Online questionnaire comment]
> *'I do not think data is deliberately used to hold teachers professionally accountable, but it seems to be the inevitable consequence of data use. I think this is a negative way forward, creating the same problems as seen in the health service.'* [Online questionnaire comment]

[27] These views were expressed many times by a wide cross-section of respondents.

Attainment data is one more piece of information about a child.

Not all teachers view the use of data to hold teachers accountable in negative terms:

> *'I think data can be used to put pressure on teachers. It is used to show where value-added is happening and where it isn't happening. And that is unavoidable when you're looking at data, so I think certain teachers do feel under pressure but I am not sure that that is a bad thing. I think it is a positive thing because if using data is flagging up where a teacher is consistently getting negative value-added, then that teacher needs to be aware of it, rather than just ignoring it and pretending that things are OK when they're not.'*
>
> Advanced Skills Teacher (English), PM school

The need to view pupil performance data in the wider context of the child – a 'provisional' approach to data ***of all types*** – was widely echoed in the interviews:

> *'Attainment data is one more piece of information about a child. It doesn't tell you everything and you need to remember that you are talking about a human being as well, rather than numbers. But the numbers are another useful piece of information about that child; particularly at the start of the year when perhaps you don't know the kids as well.'*
>
> School-wide pastoral leader, MM school

> *'I think the key is more accurate data plus less emphasis on the data alone. League tables have meant that the target becomes everything: teaching is to targets and children lose independence as they become more spoon-fed. In other words, data is important but not as reliable as people think. Children become less, not more, motivated at the lower ability end.'*
>
> [Comment on questionnaire]

More than half of all staff accept that collecting performance data is a necessary feature of their lives as educators; 19% feel it is desirable; 17% feel irritated and resentful; and only 4% feel rewarded as a result. Teachers in National Challenge schools feel the least irritated and the most positive about pupil performance data.

> *'We're a Challenge school, so obviously the pressure is on as far as GCSE is concerned. That has influenced hugely the way we use target data. Before that happened, it was very ad hoc and some departments used it well and some did not. It is now much more consistent across the school.'*
>
> School-wide pastoral leader, MM school, **referring to the way school level evaluation data can influence the way data is used to track progress and inform target setting at the individual pupil level**

Two of the interviewees summed up something of the overall pragmatic view as follows:

> *'I think all schools are data-driven now. They have to be because of the government and their own targets, and … the fact that the LA comes and says you have to set your targets and challenges, and then you're always working to those the government sets the LA.'*
>
> School-wide pastoral leader (and SENCO), CC school

> *'As long as my pay is measured by what level my students achieve, I will try to swing my levels as high as I can manage, by whatever means possible. Accurate data, which is meaningful to both student and teacher, must rest on teachers' professional judgement to be of any use. Yet my professional judgement is always going to be called into question if my pay depends on it.'*
>
> [Comment on questionnaire]

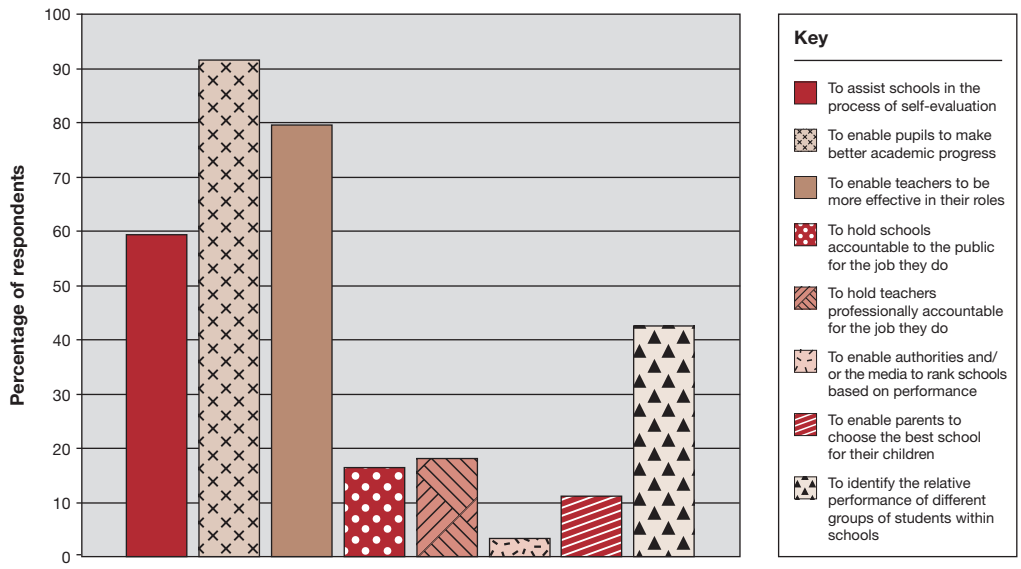
Accurate data, which is meaningful to both student and teacher, must rest on teachers' professional judgement to be of any use.

When asked what the reasons for collecting pupil performance data *should be* (offering the same answer options as previously), the responses (see Figure 7 below) were markedly different to those in Figure 6. There is clearly a huge difference between what staff think are the *existing* reasons for collecting pupil data and what they think they *should be*. More than 90% feel that pupil performance data *should be* collected primarily 'to enable pupils to make better academic progress' (up 20% on what they think of this as the *existing* reason); about 80% think that it *should be* primarily to 'enable teachers to be more effective' (up about 15%). All the other (six) answers are significantly down on what staff thought of them as *existing* reasons (c.f. Figure 6), most noticeably with the four 'external' reasons (on the right hand side of Fig. 6 and Fig. 7): to hold schools accountable; to hold teachers accountable; to rank schools according to performance; and to enable parents to choose the best school. What is quite clear is that teachers and school managers think that the current reasons for collecting pupil data are primarily 'external' (i.e. for accountability and public use), but that it *should be* collected primarily for 'internal' reasons (i.e. for self-evaluation, and pupil and teacher improvement).

The interviews highlighted further the frustration teachers feel at (what they see as) the inappropriate use of data for external accountability purposes; what might be termed examples of 'unintelligent accountability' on the part of external agencies such as local authorities, Ofsted and Government:

> *'I feel that there are mixed messages from governments about this. For example, our last year's FFT(D) which put us in the top 25% of schools in the country for value-added, says we should get 28% of our kids 5 or more A*–C GCSE grades including English and maths, but as a National Challenge school you have to get 30%. And we were beaten up as a rubbish school because we didn't get 30%. But we're in the top 25% of schools nationally and we've only got 28%! And both those figures, both those sets of demands, have come from the same government! It's not joined-up thinking and it's a crude use of data.'*
>
> School-wide pastoral leader, MM school

Figure 7: Preferred main aims for collecting pupil attainment data



I think our use of data is driven very much by external pressure…

This respondent refers to both school level evaluation data and data used to inform target setting (including Fischer Family Trust estimates data, which is in fact not produced by the government). The fact that the National Challenge attainment floor target and progress estimates based on value added statistical models can give rise to such different views of the challenge for this school is clearly difficult to reconcile in the eyes of this respondent. It illustrates the tensions that can arise for schools with challenging data profiles.

Others were concerned that the over-emphasis on external school-level accountability detracts from a more focused use of data to evaluate pupil progress:

> *'I think our use of data is driven very much by external pressure … I think if we weren't asked constantly by these external people for data, data use would be much more specific and much better aimed at the individual student.'*
>
> Classroom teacher (and Union Rep), CC school

School-wide leaders working in coasting schools suggest that they focus on using **school level evaluation** data more to prove a point than to improve outcomes:

> *'Trying to analyse our value-added and work out where we have negative and positive residuals (and what that will show us) should be about looking at our capacity to improve, but instead we are just trying to prove that we should still be a viable institution, and I find that quite scary really.'*
>
> Assistant Head (and Data Manager), CT school

> *'The school is based in a … poor metropolitan area so we tend to be towards the bottom anyway, nationally, as a group. We've got huge pockets of deprivation. The kids, in the great scheme of things, are making progress, but if you look at more affluent areas like the 'shire counties', you're not going to make the same gains that are expected by government. It is just not going to happen because the social impacts are too great.'*
>
> School-wide pastoral leader (and SENCO), CC school

Not everyone views external pressures as negative. A key question seems to be where the balance lies in terms of the accountability-improvement tension. **The following response suggests that the accountability agenda may both inform and dictate that schools take a sophisticated approach to the tracking of pupil attainment and progress using a blend of data sources to inform expectations of individuals and groups of pupils**:

> *'Use of data is influenced by external pressures. I think because of the national agenda and Ofsted's new Section 8 criteria,[28] we are looking increasingly at specific groups of students who are underachieving, and data is invaluable to us in helping to identify where that is happening. It prevents these groups who seem to be trailing off at the bottom end of the results tables from underachieving. If we can intervene fast and see that they are actually not getting the scores that the data tells us they should be getting, then we know that we can help them.'*
>
> Advanced Skills Teacher (English), PM school

[28] Inspections of schools placed in special measures are carried out under section 8 of the Education Act 2005, but Her Majesty's Chief Inspector (HMCI) may elect to treat them as 'section 5 inspections' using powers under section 8 of the Act. The statutory guidance is available at www.standards.dfes.gov.uk/sie/si/SCC.

We get these arbitrary targets and I don't know exactly how they have been created, but I don't feel that they are very accurate.

Some classroom teachers, however, question the de-professionalisation that may result from data being used by their senior colleagues to make retrospective judgements of them as classroom teachers and to set what they perceive to be artificial or contrived expectations of pupil progress. **The following comments refer to both evaluation data at the pupil level as well as pupil estimates data used to inform target setting**:

> *'This year, after our GCSE results, we received spreadsheets with profile targets for each of our Year 11 pupils and we'd never seen that data before. Some outside national agency had looked at the data and decided on the basis of that and their social class and where we are in the country that that individual pupil should have attained such and such a grade. And that is very demoralising for teachers because they are the ones who know the pupils and how well they have been doing in previous years and really it's how the pupils have been working in schools that makes the biggest difference in the grade they achieve; not what somebody else fixes with a standardised test.'*
>
> [Comment on questionnaire]

> *'We get these arbitrary targets and I don't know exactly how they have been created, but I don't feel that they are very accurate. And they seem to get worse every year; they seem to set absurdly high targets which we then know we'll fail to reach. And they don't really explain how they get to these targets. I feel that somebody ought to be protesting about this because we get beaten with that stick.'*
>
> [Comment on questionnaire]

> *'I think teachers generally want to set stretching targets for their pupils so I think we should be trusted to do that. I think there is a little bit of an obsession with the science of standardised testing, certainly in English, which is my field. I think it is absurd. I strongly disagree with imposing targets that are created out of only standardised test results. I think I would much prefer a system where teachers were trusted.'*
>
> Classroom teacher (English), CC school

Generally teachers are positive about using data 'to enable pupils to make better academic progress' and 'to enable teachers to be more effective', but are negative about **pupil level evaluation** data being used to hold them to account, even in schools that have positive data pictures, as this comment illustrates:

> *'You do have this pressure and I think the data has made it more difficult for teachers to do the job. What if you are not achieving so well or if you are below some average that is artificially put? What happens then? Do you lose your job? It certainly does put pressure on teachers and it may influence the retention of teachers.'*
>
> Classroom teacher (mathematics), PP school

Overall, concern was expressed that a reliance on pupil attainment data detracts from an holistic approach to education and that there is an emerging over-emphasis on 'official' data:

> *'As a teacher I collect data all the time but none of it can be expressed as a number or letter. Some of it is acted upon immediately in the classroom. We are supposed to call this 'Assessment for Learning', but what it actually is, is a teacher setting a task, watching what happens and then giving individuals feedback and advice. This is what I was trained to do and this is what I do all day, every day. Some of the data I collect is stored as a memory and acted upon later: a memo to a colleague; a phone call to a parent; a change to the way I present a task/skill/concept next time I teach it.'*
>
> [Comment on questionnaire]

I really like teaching but I despair at the state of our education system and the degree to which we are now driven by targets and data and learning objectives…

'I really like teaching but I despair at the state of our education system and the degree to which we are now driven by targets and data and learning objectives and learning outcomes and lesson objectives and WILF and TIB and all the rest of the nonsense that we have to deal with. I try to be a good teacher – I reckon I am a good teacher – and the kids in my classes behave well, work hard, and leave the room feeling that they have achieved something. They feel safe in my room and they enjoy what we are doing. I never put learning objectives on the board and never will. I want them to learn the stuff, not just know what I am supposed to be teaching them without actually learning it!'

[Comment on questionnaire]

'I hope that I will still be around when the education system realises how wrong it has been and once again allows teachers to do what they do best!'

[Comment on questionnaire]

14. Conclusion

There are clear and persistent patterns of difference in the responses given by those in senior management, and middle managers and classroom teachers.

The utilisation of pupil attainment and progress data is a key element of the professional practice of all teachers. The results of this study show that teachers make regular use of such data, have the necessary skills for the task, and are broadly satisfied with their level of use. The responses to open questions and telephone interviews are consistent with this positive view although a number of responses were more equivocal about the place, purpose and value of the data.

It is interesting that schools with significantly high CVA scores reported the highest extent of use of data and the highest level of satisfaction with use. This may be indicative of a developed culture in these schools around the use of data at the pupil level and at the school level. The school level CVA score is dependent on the *degree of progress* made by every pupil in a cohort, whereas threshold measures simply count the proportion of pupils who manage to get 'over the bar'. Improving the school-level CVA score is not easily achieved by targeting a focus group of students, whereas threshold measures (such as the percentage 5+A*–C at GCSE) tend to focus on a narrower set of 'borderline' pupils. Thus it may be that schools with a significantly high CVA are focusing on the progress of a wider range of students which requires the use of data to be more devolved to make the task manageable. More in-depth research in schools with a variety of data profiles regarding the use of effectiveness data specifically for improvement purposes could shed light on whether this is indeed the case.

The significant association between training and improved understanding (of data) has clear CPD implications. The positive news is that training makes a difference both to teachers' understanding and their satisfaction with that level of understanding. Classroom teachers need to have training at least on an annual basis, but less frequent training can still have a significant impact for senior leaders.

There are clear and persistent patterns of difference in the responses given by those in senior management, and by middle managers and classroom teachers. This is understandable as data is often a key tool in monitoring progress and benchmarking performance against other schools operating in similar contexts, but there is a clear hierarchy of data use within schools. Responsibility for the management, analysis and interpretation of data lies overwhelmingly within the senior management group and while this approach may be expedient in terms of management (given the volume of effectiveness data coming through to schools), it tends to lock-up access and expertise within a narrow set of staff acting as 'gatekeepers'. The fact that a large proportion of teachers would prefer to have data analysed and interpreted by teams of senior teachers or within departments suggests that schools may need to become more 'democratic' with their data to keep staff 'on board'. Such a democratisation would require wider access than currently exists to sources such as RAISEonline, which this research suggests would be a major challenge. The qualitative data from the interviews and the comment boxes suggests a continuum of how 'democratic' schools are with data, and whether school structures constructed around data management serve or hinder the development of positive data-cultures. Table 3 on page 41 shows some identifying features of the extreme positions across a number of criteria related to the use of pupil attainment and progress data. Clearly most schools lie somewhere in the middle and share characteristics, but the typology serves as a starting point for future school self-evaluation.

Table 3: School data-culture: extreme positions across a number of criteria related to the use of pupil attainment and progress data

Data dictatorship	Data democracy
Led by 'data gatekeepers'	Led by 'data advocates'
Deficit view of colleagues	Developmental view of colleagues
Data manager: views self as 'data expert'	Data manager: views self as 'data facilitator'
Need to control	Need to support
Teachers get what they are given	Teachers given appropriate access
Pre-digested data-bytes	Undigested data sets
Prevented from exploring further	Encouraged to explore further
Colleagues de-skilled	Colleagues up-skilled
Stilted self-evaluation	Wide-ranging self-evaluation

References

Balls, E. (2008) 'Gaining Ground – Improving progress in coasting secondary schools', letter to all Local Authority Directors Children's Services [online] accessed on 12th February 2009 at: http://www.standards.dcsf.gov.uk/sie/documents/sos.pdf

Bush, A., Edwards, L., Hopwood Road, F. and Lewis, M. (2005) 'Why here? Report of Qualitative Work with Teachers Working in Schools Above and Below the Floor Targets'. *DfES Research Report RR666*. Nottingham: DfES Publications.

Day, C., Sammons, P., Hopkins, D., Harris, A., Leithwood, K., Gui, Q., Penlington, C., Mehta, P. and Kington, A. (2008) 'The Impact of School Leadership on Pupil Outcomes'. *DCSF Research Report RR018*. Nottingham: DfES Publications.

DCSF (2008a) 'Achievement and Attainment tables 2008: Secondary School (GCSE and equivalent)', [online] accessed during February 2009 at: http://www.dcsf.gov.uk/performancetables/schools_08.shtml

DCSF (2008b) 'Part Five System Wide Reform: Opportunities For High-Performing Specialist Schools (HPSS)' [online] accessed on 12th November 2009 at: http://www.standards.dcsf.gov.uk/local/word/part5hpss0309.doc

Downey, C. and Kelly, A. (2008) 'Utilising value-added progress data in the context of Every Child Matters'. Paper presented at the International Congress for School Effectiveness and Improvement (ICSEI) Auckland, New Zealand, 9th January.

Dudley, P. (1997) 'How teachers respond to pupil data', paper presented at the BERA Annual Conference. York, 10–14 September.

Dudley, P. (1999a) 'Primary schools and pupil data', in: Southworth, G. and Lincoln, P. (Eds) *Supporting Improving Primary Schools: the Role of Heads and LEAs in Raising Standards*. London: Falmer Press.

Dudley, P. (1999b) 'Using data to drive up standards: statistics or psychology?', in: Conner, C. (Ed.) *Assessment in Action in the Primary School*. London: Falmer.

Hutchison, D. and Schagen, I. (2008) 'Concorde and discord: the art of multi-level modelling', *International Journal of Research & Method in Education*, 31(1), 11–18.

Kass, G. (1980) 'An Exploratory Technique for Investigating Large Quantities of Categorical Data', *Journal of Applied Statistics*, 29(2), 119–27.

Kelly, A. and Downey, C. (2007) 'Are value-added scores getting the measure of school performance in the UK?'. Paper presented at the International Congress for School Effectiveness and Improvement (ICSEI) Potorož, Slovenia, 6th January.

Kirkup, C., Sizmur, J., Sturman, L. and Lewis, K. (2005) 'Schools' Use of Data in Teaching and Learning'. *DfES Research Report RR671*. Nottingham: DfES.

Miliband, D. (2003) 'The Annual Leadership Lecture 2003'. Nottingham: National College of School Leadership. October.

Miliband, D. (2004) 'Personalised Learning: Building a new relationship with schools'. Paper delivered at the North of England Education Conference. Belfast, January.

Pricewaterhouse Coopers (2008) 'High Performing Specialist Schools: Interim Evaluation'. *DCSF Research Report RW034*. Nottingham: DCSF.

Sammons, P. (2007) 'School effectiveness and equity: making connections'. Reading, CfBT Education Trust.

Saunders, L. (2000) 'Understanding schools' use of 'value added' data: the psychology and sociology of numbers'. *Research Papers in Education*, 15(3), 241–58.

Saunders, L. and Rudd, P. (1999) 'Schools' use of 'value added' data: a science in the service of an art?'. Paper delivered at the British Educational Research Association Conference (BERA). Brighton, September.

Stevens, J., Brown, J., Knibbs, S. and Smith, J. (2005) 'Follow-Up Research into the State of School Leadership in England'. *DfES Research Report RR633*. Nottingham: DfES Publications.

TDA (2007a) *Professional Standards for Teachers – Qualified Teacher Status*. London: Training and Development Agency for Schools.

TDA (2007b) *Professional Standards for Teachers – Core*. London: Training and Development Agency for Schools.

TDA (2007c) *Professional Standards for Teachers – Post Threshold*. London: Training and Development Agency for Schools.

TDA (2007d) *Professional Standards for Teachers – Excellent Teachers*. London: Training and Development Agency for Schools.

TDA (2007e) *Professional Standards for Teachers – Advanced Skills Teachers*. London: Training and Development Agency for Schools.

CfBT Education Trust
60 Queens Road
Reading
Berkshire
RG1 4BS

0118 902 1000

www.cfbt.com

PMS 5417 09/10 ISBN 978-1-907496-21-9