An investigation of Headteachers' and teachers' views towards science-specific CPD

Helen Everett
Shona MacLeod
Nalia Thurgood

April 2013

Table of Contents

Executive summary

Report brief

This report presents the findings from an investigation into the views of senior staff with responsibility for determining continuing professional development (CPD) strategy (CPD leaders), within schools and further education colleges (FE colleges). In particular, it explores the views of these staff towards science-specific CPD. The research was commissioned by Myscience and was carried out by a team at the National Foundation for Educational Research (NFER). The research employed both qualitative and quantitative methods, and this report draws on research findings from:

- a computer assisted telephone interview (CATI) survey of 400 CPD leaders in a variety of primary and secondary schools, and FE colleges in England. This survey was conducted between August and October 2012.

- follow-up interviews with 19 CPD leaders who had participated in the CATI survey. These interviews were conducted between January and March 2013.

- two face-to-face focus groups which were conducted with Heads of Science and aspiring Heads of Science (HoS) who were attending a residential course at the National Science Learning Centre (NSLC) in January 2013.

Aims of the research

The main aim of this research is to investigate the views of senior staff, with responsibility for leading CPD strategy, within schools and FE colleges towards science-specific CPD. Myscience intend that this research will provide insights which can help to inform strategies to support and encourage further participation in science-specific CPD at the National and Regional Science Learning Centre/s.

The research explores CPD leaders' views on a wide range of aspects of science-specific CPD, and how CPD is evaluated within schools and FE colleges. The views of Heads of Science are also explored in order that views on science-specific CPD can be contextualised and further insights can be gained by comparing and contrasting the responses given by the two groups of participants. The questions explored in this research include:

- What science-specific CPD is undertaken and what form does it take?

- What is the value of engaging in science-specific CPD and what are the expected outcomes?

- What prevents science staff from undertaking science-specific CPD?

- To what extent, and how, is science-specific CPD evaluated?

Key findings and recommendations

Science-Specific CPD

The current landscape of CPD in schools

- There is an enormous variation in the amount of science-specific CPD undertaken in schools and FE colleges and the ratio of science-specific CPD to non science-specific CPD also shows a large variation.

- The type of CPD undertaken depends on the school's, or college's, priorities and needs. Schools in which the whole school needs are less pressing tend to engage in a higher proportion of science-specific CPD.

- The type of CPD in which schools most frequently engage is related to aspects of general teaching and learning. For example, the use of open questions and facilitating group work.

The value of CPD

- CPD leaders consider the value of CPD for the school to be that it promotes consistency in practice. CPD is of value to both the individual and the school in that staff are able to update and improve their knowledge and skills.

- Heads of Science primarily regard CPD as being of value to the individual, and to a lesser extent the school, in that it allows for updating and improving of knowledge and skills.

CPD in schools

- Heads of Science want CPD to be relevant, up to date and to be in a form which can be immediately applied to their subject teaching.

- CPD leaders believe that the aims and value of CPD for the school are clearly communicated to the staff. Science staff commonly did not perceive this to be the case.

- CPD leaders regard internal CPD as the most effective form as it can be tailored to the needs of the school and the effects can be ongoing. Science staff favour external CPD over internal CPD.

- CPD is perceived to be most effective if it takes into consideration the views and needs of staff e.g. if it evolves from the ground up rather than being imposed, and if it is undertaken over an extended period of time rather than being a one off activity. This view is held by both CPD leaders and Heads of Science.

- Internal CPD is increasingly schools' or FE colleges' first choice of CPD provision. The data indicated that this is partially due to financial constraints, but also an increasing recognition of the expertise available within the school or college

Barriers to science-specific CPD

- The main barrier to school staff undertaking science-specific CPD is the financial burden of accessing CPD. Other barriers include course location, and low awareness of the science-specific, or specialised, courses available.

- The Enthuse Award is considered invaluable in enabling science teachers to take up opportunities to undertake science-specific CPD.

Evaluation of CPD

The extent to which CPD is evaluated

- Most schools are evaluating CPD, although this occurs to a varying extent across schools and there is generally an absence of a systematic approach to evaluation.

- There is a misconception amongst some interviewees about the distinction between evaluation and dissemination.

- The typical aspects of CPD being evaluated are staff satisfaction, value for money and impacts on teaching practice. There is limited evidence of evaluation relating to the impacts of CPD on pupils.

How is CPD evaluated

- Evaluation forms are the most common method of evaluating CPD and the evaluation process mainly occurs through performance reviews/staff appraisals, lesson observations and learning walks, and through informal discussions/ peer-to-peer support.

- Evaluations are conducted by a variety of people within the school and FE college, including CPD leaders, members of the Senior Management Team, line managers and Heads of Departments. The people involved depend on the evaluation method used.

Outcomes being evaluated

- According to CPD leaders, who participated in the study, the main CPD outcome being evaluated is impact on teaching practice, primarily through an assessment of increases in teacher confidence and skills.

- Where limited attempts have been made to evaluate pupil outcomes, this is primarily evidenced through improved teacher practice and a perceived 'knock-on' effect on pupils.

- There is a widespread lack of understanding on how to approach the evaluation of the impact of CPD on pupils.

Conclusions

The uptake of CPD in any form is widespread across schools and FE college. However, the amount of science-specific CPD undertaken varies from institution to institution and is related to a school's, or FE college's, assessment of what wider improvements are considered necessary across the whole institution.

CPD leaders and Heads of Science hold different perspectives on the management of CPD provision within their school or FE college particularly in relation to the clarity with which the aims and value of CPD are communicated. According to CPD leaders, and some Heads of Science, CPD is most effective when it is based on a 'bottom-up' approach to the identification of CPD needs. However, these two groups differ on the most effective location for the provision of CPD.

Staff participation in CPD is evaluated to varying degrees and the evidence highlights an absence of a systematic approach to evaluation, across schools and FE colleges. Misconceptions of the distinction between evaluation and dissemination are frequent and these terms are often used interchangeably. This is likely to become an increasingly urgent issue to address in future given recent changes to the Ofsted Framework which emphasise the importance of the links between CPD to performance management, teaching and pupil attainment. Where CPD is evaluated, evidence is most commonly captured through the performance management system and typically focuses on aspects of teaching practice. Evaluation evidence of the impact of CPD on pupils is very scarce and progress in this area is urgently required to enable schools and FE colleges to demonstrate the impact of CPD on learners' behaviour, progress and quality of learning, an explicit requirement introduced by the recently revised Ofsted Framework.

Recommendations

For the Myscience and the National and Regional Science Learning Centres

- Provide continued support for schools and FE colleges to ensure that internal/on-site CPD is of a high quality, relevant to science teachers and is focused on maximising outcomes and impacts for pupils.

- Provide guidance to help CPD leaders and teachers to recognise existing, and potential, ways of collecting valid and robust evidence of impact from CPD within their school and assessing the impact of CPD on pupils' learning.

- Recognise that schools and colleges have similar attitudes towards the value placed on science-specific CPD, and towards prioritising CPD in one curriculum area over another, irrespective of previous levels of engagement with the network of SLCs.

For schools and colleges

- *CPD leaders* could usefully consider how to incorporate a more 'bottom-up' approach to the identification of CPD needs within their current CPD planning processes. *Heads of Science* could encourage their staff to share identified CPD needs, but also good practice in the area of evaluating the impact of CPD on pupils' achievement.

- *CPD leaders* need to consider how to articulate the vision for, and purpose of, CPD at a number of different levels within their school or FE college.

- *CPD leaders* should provide examples of how attendance at subject-specific CPD can be evaluated, what kinds of evidence should be collected and what kinds of impact on pupils' achievement can be expected as a result. *Heads of Science* should provide teachers with opportunities to share their views about pupils' achievement, and their incremental improvements, on a more frequent basis.

1. Introduction

1.1 The aims of the project

The aim of this research is to explore the views of senior staff with responsibility for determining continuing professional development (CPD) strategy within schools and further education colleges (FE colleges). In particular, it explores the views of these staff towards science-specific CPD. The responsibility for CPD differs between schools and FE colleges; sometimes this role is overseen by the headteacher, but often it is the responsibility of a deputy or assistant headteacher. The term 'CPD leader' is therefore used to encompass this diversity.

Science-specific CPD falls within the wider context of a school's, or FE college's, approach to CPD (such as the focus of CPD and who can access it) and decision making will almost certainly involve other members of staff in addition to CPD leaders. In order to understand decision making and issues related to science-specific CPD, it is necessary for the research to take an approach which is broader than solely focusing on CPD leaders' views of science-specific CPD. Therefore, although the research is primarily interested in the views of CPD leaders, the perspectives of Heads of Science have also been sought. This allows a greater understanding of CPD in schools and FE colleges to be gained. For example, it enables any differences which may exist between the CPD leaders' understandings and aspirations, and what occurs at a practical level, to be highlighted. As a result, throughout this report CPD leaders' views are compared and contrasted with those of new and aspiring Heads of Science (hereafter referred to as Heads of Science and occasionally HoS) where appropriate.

In addition, it is necessary to elicit respondents' views on general CPD, and not merely science-specific CPD, to enable us to greater understand the value placed on science-specific CPD, and to elucidate the factors underlying decisions relating specifically to science-specific CPD

The specific questions explored in this research include:

- What science-specific CPD is undertaken and what form does it take?
- What is the value of engaging in science-specific CPD and what are the expected outcomes?
- What prevents science staff from undertaking science-specific CPD?
- To what extent and how is science-specific CPD evaluated?

The report consists of two main findings chapters: the first covering the CPD leaders' views on science-specific CPD, and the second focusing on how CPD is evaluated. Both of these chapters start with a brief review of the literature relevant to the

section. The report concludes with recommendations for the schools and teachers, but also for Myscience and the National and Regional Science Learning Centres in order that they can enhance their CPD programmes and products, and the marketing of these.

1.2 The context for this research

There have been a number of recent changes to the context for undertaking CPD in schools and FE colleges. There are two particular factors which are currently likely to be having an effect or will soon affect the ways in which schools and FE colleges, select and engage with CPD. These are

- the current economic climate.
- recent changes to the Ofsted Framework.

The economic climate

The current economic climate is widely regarded as increasing pressure on educational budgets in general (Chowdry and Sibieta, 2011). CPD budgets are unlikely to be immune, or protected from any reductions in spending that a school or FE college may have to make.

The Ofsted Framework:

The provision of CPD in schools has increasingly become more formalised and it is now a recognised part of a teacher's role and a school's responsibility (Bishop and Denlag, 2006). But the latest Ofsted Framework makes a further change to the CPD environment by at various points linking professional development, performance management, teaching and pupil attainment.

Within the framework where mention of the evaluation of teaching is made it states:

> *... a connection should be made to the **impact** it has on learners' behaviour, progress, and the quality of learning, making specific reference to different groups of learners wherever possible* [1].

An emphasis is also put on the link between professional development and performance management with the framework, stating that inspectors now have to consider the extent to which school leaders and managers:

> *ensure that all teaching staff benefit from appropriate professional development and that performance is rigorously managed.*[2]

In addition the School Inspection Handbook[3] highlights that one inspection criterion will be how effectively senior leaders use performance management and the school's

---

[1] OFSTED new Guidance on the Use of Evidence Forms (for inspectors) Jan 2013

[2] Ofsted Framework December 2012 http://www.ofsted.gov.uk/resources/framework-for-school-inspection section 59

self-evaluation to focus CPD. A range of ways that this can be demonstrated is given and these include:

- analysis of the impact of CPD on teaching.
- scrutinising the school's records on CPD and the evaluations of CPD.

The subject-specific guidance[4] also emphasises the need for subject leaders to ensure that CPD is well targeted, and that it is evaluated for its impact. Staff professional development should enable teachers to help maximise their pupils' achievement and success.

1.3 Research design and methods

This research employs a mixed methods design (using both qualitative and quantitative methods) and includes a rapid review of the literature, a CATI (computer assisted telephone interview) survey, in-depth telephone interviews and focus groups. This section discusses the methodology and the sample. A more detailed profile of the sample can be found in Appendix 2.

At the beginning of the research, a rapid literature review was undertaken of the existing evidence pertaining to the main research questions. This covered an in-depth review of 22 sources of literature which informed the design of the research instruments and provided a basis for contextualising and interpreting the findings.

The views of CPD leaders were obtained in two ways. The first was through a short 10 minute CATI survey, which was conducted with 400 CPD leaders in the autumn term of 2012 (August 2012-October 2012). The sample included schools and FE colleges which had varying levels of engagement with science-specific CPD. The sample also included CPD leaders from a cross-section of schools and colleges in terms of socio-economic status (percentage of free school meals being used as a proxy indicator of levels of deprivation) and school locations (rural/urban).

---

[3] Ofsted School Inspection Handbook January 2013 http://www.ofsted.gov.uk/resources/school-inspection-handbook p14/15, section 57.

[4] OFSTED Science survey visits: Generic grade descriptors and supplementary subject-specific guidance for inspectors on making judgements during visits to schools (Oct. 2012) Grade descriptors – quality of leadership in, and management of, science p.10

Table 1.1 Types of schools in the CPD leaders' CATI survey sample

Phase of education	Number of schools
Primary	137
Secondary	183
FE College	80

A total of 400 respondents.
Source: CPD Leaders CATI survey 2012

To select the sample of schools and FE colleges which would be invited to participate in the CATI survey a dataset was initially obtained from the National Science Learning Centre. This included schools and colleges which had engaged with NSLC, and the extent of the engagement. This dataset was matched with NFER's Register of Schools to ensure that the sample included non-engaged schools/colleges and to increase the number of FE colleges in the dataset. A sample of 2,500 schools and FE colleges was then selected. This comprised of 300 FE colleges, 1,350 secondary schools and 850 primary schools. Within each of these 3 phases, schools and colleges were selected which covered a mix of engagement levels. The successfully completed interviews were monitored to ensure that the achieved sample approximately included 150 primary schools, 150 secondary schools and 100 FE colleges.

The CATI survey consisted of sixteen questions including four open questions. At the end of the survey CPD leaders were also asked whether they would be willing to participate in a follow-up interview or focus group which would take place in January/February 2013 (see Appendix 3 for the CATI survey instrument). Semi-structured telephone interviews, conducted in January and February 2013, explored the views of CPD leaders in more depth. Whilst again focusing on the main research questions, the interviews also explored some of the issues emerging from the CATI survey. Participants were initially invited to participate in focus groups; however low uptake led to most participants being interviewed by telephone. The interviews lasted about 30 minutes and the participants were drawn from those undertaking the CATI survey who indicated that they would be willing to participate in further research. Participants again covered every phase of education and different levels of engagement with science-specific CPD. As Table 1.2 below shows, a total of 19 interviews were conducted with CPD leaders.

Table 1.2 Number of CPD leaders' interviews conducted in each phase of education

Phase of education	Number of interviews
Primary	8
Secondary	6
FE College	5

A total of 19 respondents.
Source: CPD Leaders' interviews 2013

In addition, in order that a comparison could be made between the CPD leaders and science teachers themselves, two face to face focus groups were conducted in January 2013. These were held at the National Science Learning Centre and consisted of 17 current Heads of Science or aspiring Heads of Science who were attending a residential course at the NSLC.

2. Science-Specific CPD

Key Findings

The current landscape of CPD in schools

- There is an enormous variation in the amount of science-specific CPD undertaken in schools and FE colleges and the ratio of science-specific CPD to non science-specific CPD also shows a large variation.

- The type of CPD undertaken depends on the school's or college's priorities and needs. Schools in which the whole school needs are less pressing tend to engage in a higher proportion of science-specific CPD.

- The type of CPD in which schools most frequently engage relates to general teaching and learning. For example, the use of open questions and facilitating group work.

The value of CPD

- CPD leaders consider the value of CPD for the school to be that it promotes consistency in practice. CPD is of value to both the individual, and to a lesser extent the school in that staff are able to update and improve their knowledge and skills.

- Heads of Science primarily regard CPD as being of value to the individual, and the school, in that it allows for updating and improving of knowledge and skills.

CPD in schools

- Science staff want CPD to be relevant and up-to-date, and in a form which can be immediately applied to their subject teaching.

- CPD leaders believe that the aims and value of CPD for the school are clearly communicated to the staff. Heads of Science commonly do not perceive this to be the case.

- CPD leaders regard internal CPD as the most effective form as it can be tailored to the needs of the school and the effects can be ongoing. Science staff favour external CPD over internal CPD.

- CPD is perceived to be most effective if it takes into consideration the views and needs of staff e.g. if it evolves from the ground up rather than being imposed, and if it is undertaken over an extended period of time rather than being a one off activity. This view is held by both CPD leaders and Heads of Science.

- Internal CPD is increasingly schools' or FE colleges' first choice of CPD provision. The data indicated that this is partially due to financial constraints, but also an increasing recognition of the expertise available within the school or college.

Barriers to science-specific CPD

- The main barrier to school staff undertaking science-specific CPD is the financial burden of accessing CPD. Other barriers include course location, and low awareness of the science-specific, or specialised courses available.

- The Enthuse Award is considered invaluable in enabling science teachers' to take up the opportunity to undertake science-specific CPD.

2.1 Introduction

This chapter focuses on what CPD is being undertaken within the schools and FE colleges and specifically focuses on science-specific CPD. It is divided into four sub-sections:

- the current landscape of CPD in schools.
- the value of CPD.
- CPD undertaken in schools.
- barriers to science-specific CPD.

These findings draw on the data obtained from the CPD leaders' survey and the focus groups with Heads of Science as well as the interviews with CPD leaders. The CPD leaders' survey data was analysed so that comparisons could be made between education phases (primary, secondary and FE), but also by the extent of schools' and FE colleges' engagement with science-specific CPD (low, medium and high) (see Appendix 1 for more details). As set out in the sections below significant differences can be detected across the phases of education, but no significant differences were found between schools and FE colleges with different levels of engagement[5].

Where appropriate, the sub-sections begin with a short review of the evidence gathered from a rapid review of the literature relating to current understandings and practice around CPD and specifically, where possible, science-specific CPD.

2.2 The current landscape of CPD in schools and FE colleges

The diagram (Figure 2.1) below outlines the key findings from the rapid literature review in relation to the current landscape of CPD. (The letters in brackets relate to the references which are given at the end of the chapter).

---

[5] In this report differences are labelled as significant refer to differences which are statistical significant usually at the 1%, and occasionally at the 5% level.

Figure 2.1 Review of the current evidence on the landscape of CPD in schools and FE colleges.

Decisions around undertaking CPD

There is no consistent approach among schools on who makes decisions on undertaking CPD (A).

Individual CPD needs are most commonly identified through Performance Management Reviews. (B)

Areas in which CPD is undertaken predominantly relate to school development plans and national developments (including curriculum changes) (C)

Forms of CPD

Many forms of CPD are often not recognised as constituting CPD (D)

Much CPD which takes place is quite informal (E)

There was some reported (increasing) use of coaching and mentoring, but this form of CPD is considered to be under used (F).

Teachers view internal CPD to be of lower quality and use than external CPD (G).

The use of internal CPD is increasing, as it is seen as being more cost effective (H)

The Landscape of CPD

Effective CPD

CPD was more effective if it was sustained, being conducted over an extended period of time rather than being a one off 'hit and run' session (I)

CPD which encourages and uses collaborative learning methods is also considered to be effective (J).

People also need to feel ownership of their CPD [2] and that which was imposed top down is seen as less effective with teachers more sceptical about this form of CPD (K).

Science-specific CPD

Science teachers in research reported that Science-specific CPD was undervalued by senior leadership teams (SLT) (L)

Science teachers considered that the atitude, or support of the SLT is important in enabling staff to undertake science specific CPD (L).

Little science-specific CPD appears to be being undertaken: Bishop cited research which suggeststhat only 15% of science teachers engage in science-specific CPD in a year; the Wellcome Trust report maintained that half of secondary science teachers had not had any science-specific CPD in the last five years (M).

2.2.1 Participation in all forms of CPD

The respondents to the survey conducted with CPD leaders report that in almost all the schools and colleges (over 90 per cent) CPD (in any form) is frequently being undertaken in relation to general aspects of teaching and learning across all subject areas (Figure 2.2). For example, the use of open questioning and facilitating group work. The respondents in the interviews and focus groups also report that CPD is a regular part of their working experience (here no distinction is made between general CPD and science/subject-specific CPD).

Some differences can be observed in the focus of CPD across the different phases of education (Figure 2.2). For example, responses from the CPD leaders' survey indicate that staff in FE colleges are significantly more likely than staff in primary or secondary schools to undertake CPD in behaviour management. This contrasts with the trend in primary and secondary schools where the focus is more likely to be on developing leadership.

Figure 2.2 The most important areas for CPD
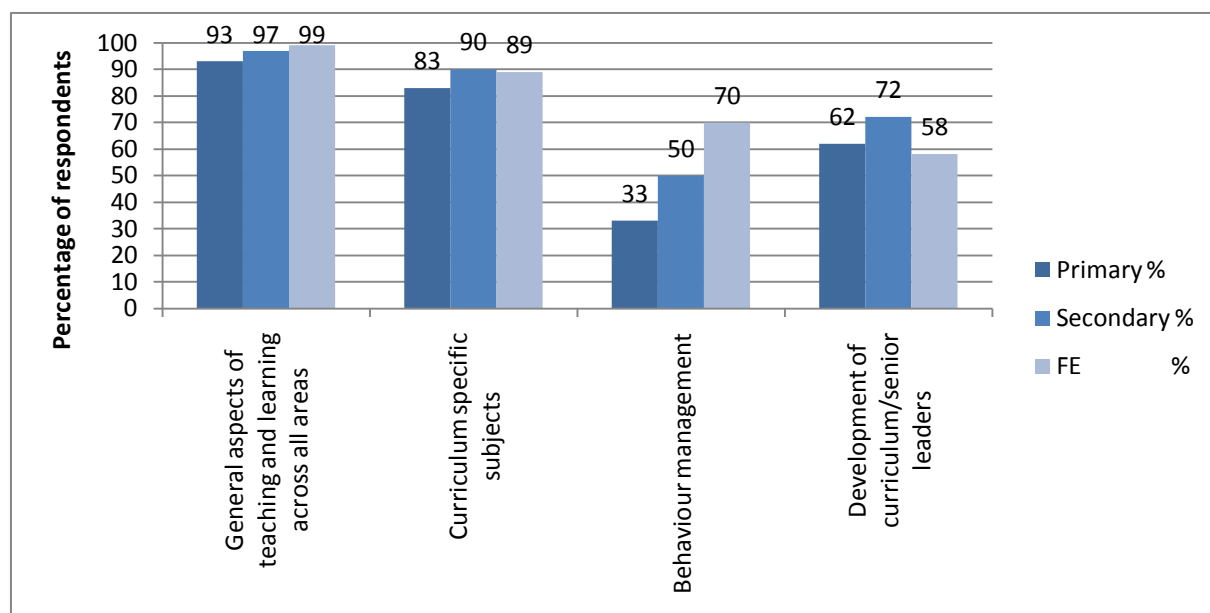
A total of 400 respondents.
Source: CPD Leaders CATI survey 2012 Q2

Evidence from the interviews and focus groups highlights that there is no specific pattern in relation to when CPD is usually undertaken. Both CPD leaders and Heads of Science report that various arrangements exist for when general CPD is undertaken in schools. Some schools have whole days of INSET, whereas others have regular twilight sessions. These twilight sessions can occur weekly or fortnightly, or can be longer sessions held every half term.

16

2.2.2 Participation in science-specific CPD

Respondents in the CPD leaders' survey (Table 2.1) report that their school or college prioritises CPD in one curriculum subject if this is considered necessary (84 per cent). This is significantly more likely to occur in primary schools (97 per cent).

Table 2.1 Percentage of Schools/FE Colleges which would prioritise CPD in one area of the curriculum over another

Response	Phase of education			
	Primary %	Secondary %	FE %	Average %
Yes	97	83	65	84

A total of 400 respondents.
Source: CPD Leaders CATI survey Q4a

According to CPD leaders, the main reason for prioritising CPD in a specific curriculum area (over another) is when examination scores identify a weakness (55 per cent, 49 per cent and 42 per cent of CPD leaders from secondary and primary schools, and FE colleges, respectively). Figure 2.3 below shows that the other commonly cited reasons include responding to government initiatives (22 per cent) or Ofsted recommendations (22 per cent), something which is again significantly more likely in primary schools (29 per cent).

The 'other' responses category for this question is large (40 per cent). These responses are primarily related to issues around identification of weaknesses, either through internal data analysis or lesson observations and internal audits, rather than the two categories identified on the questionnaire. Other responses in this 'other' category included specific staff issues, such as shortages or the needs of new staff, and the school undertaking a new initiative, such as changing schemes of work or exam boards.

Figure 2.3 Reasons for prioritising one curriculum area over another
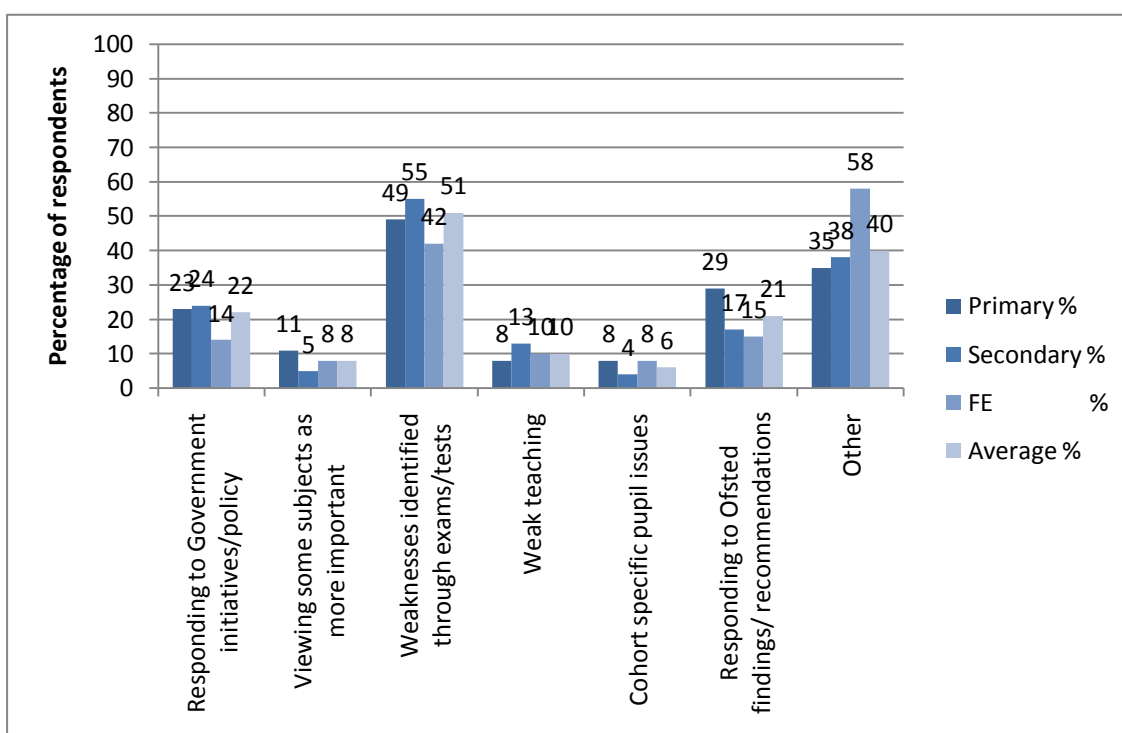
A total of 400 respondents.
Source: CPD Leaders CATI survey 2012 Q4c

As shown in Table 2.2, below, those schools and colleges which had low levels of engagement with CPD at the NSLC were slightly more likely than those with medium and high levels of engagement to consider prioritising CPD in one area of the curriculum over another, but these differences were not statistically significant (high: 80 per cent, medium: 82 per cent and low: 87 per cent).

Table 2.2 Percentage of schools/FE colleges which would prioritise CPD in one area of the curriculum over another (by school's or college's level of engagement with NSLC)

Response	Level of engagement		
	Low %	Medium %	High %
Yes	87	82	80

A total of 400 respondents.
Source: CPD Leaders CATI survey Q4a

Across all the levels of engagement CPD is most likely to be undertaken in order to improve an area where tests or examinations have shown there to be a weakness (low: 47 per cent, medium: 57 per cent, high: 47 per cent) (see Figure 2.4). Schools and colleges with low engagement with the NSLC are more likely to prioritise one subject over another when responding to government initiatives than schools or colleges with a high level of engagement (low: 26 per cent and high: 18 per cent; this difference is not significant).

Figure 2.4 Reasons for prioritising one curriculum area over another (by school's or college's level of engagement with NSLC)
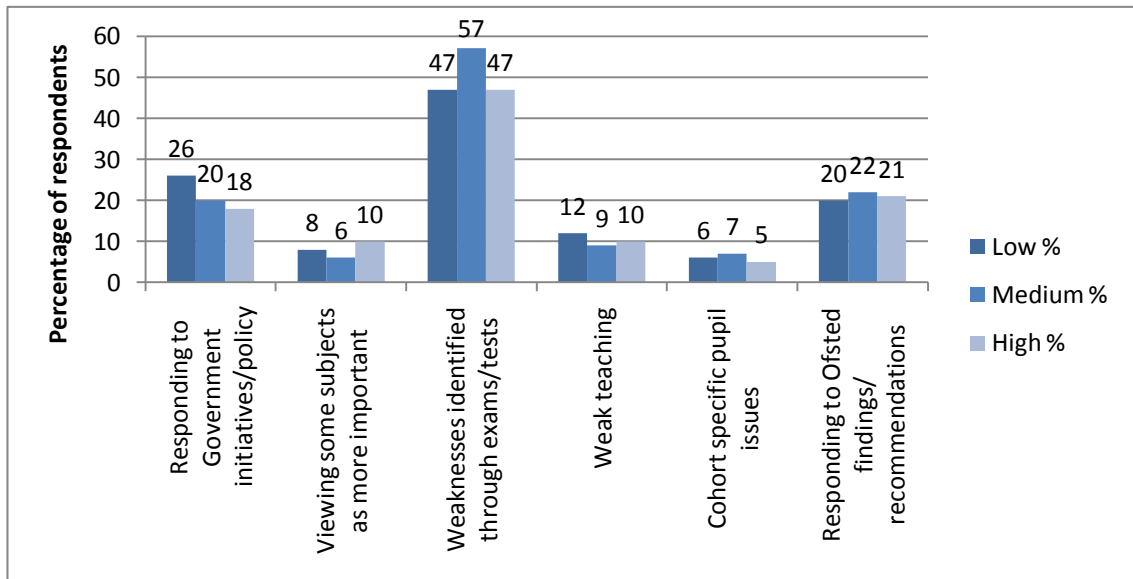
A total of 400 respondents.
Source: CPD Leaders CATI survey 2012 Q4c

The majority of respondents in the CPD leaders' survey (87 per cent) report that staff frequently engage in CPD in teaching and learning in specific curriculum subjects, and this is consistent across all phases of education (primary, secondary and FE) . When specifically considering science-specific CPD, the majority of CPD leaders report that at least one member of staff had engaged in science-specific CPD in the last 12 months (Figure 2.5).

Figure 2.5 Percentage of CPD leaders reporting that at least one member of staff had engaged in science-specific CPD in the last 12 months
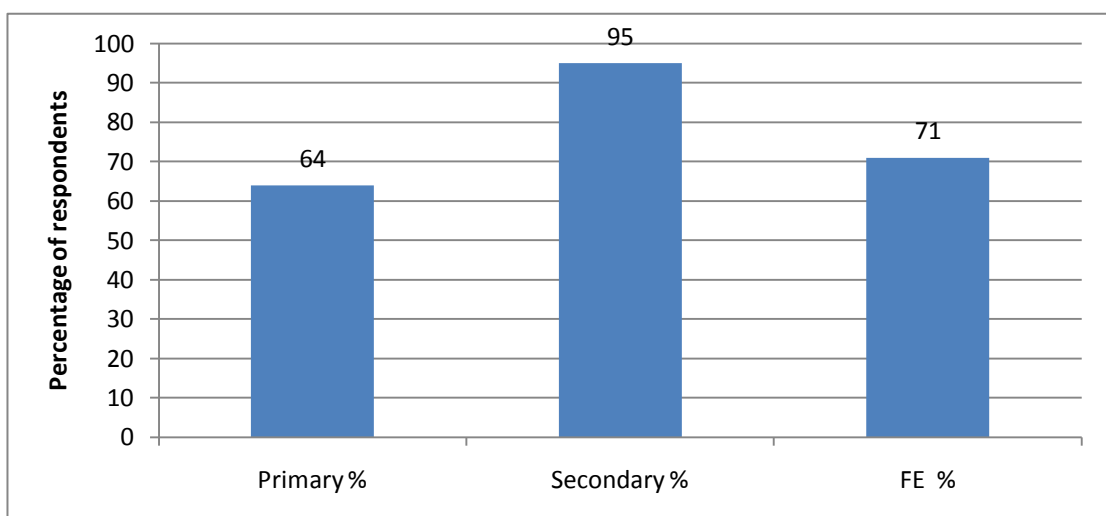
A total of 400 respondents.
Source: CPD Leaders CATI survey 2012 Q7a

The evidence from the interview and focus group responses does not fully support this view, although the question in the survey only asked respondents whether at least one member of staff had engaged in science-specific CPD in the last 12 months, which could partially account for the differences noted. Overall, the interviews and focus group responses indicate that the balance is mainly towards non subject-specific/whole school CPD. However, the amount of time spent on subject-specific CPD varies greatly between schools ranging from ratios of 70:30 (subject-specific to non subject-specific CPD) to virtually no subject-specific CPD, with the focus being all on whole-school CPD. The findings from the interviews and focus groups are consistent with other studies which have also found low levels of engagement with science-specific CPD (Bishop and Denlag, 2006; Wellcome Trust, 2006),

Although this low focus on subject-specific, particularly science-specific CPD, is noted by respondents from all educational phases, it is particularly consistent in the primary phase. All the primary CPD leaders interviewed refer to an imperative to focus on teaching and learning in English and mathematics as these are the basis for their floor targets. From their perspective, a failure to reach these targets would have negative consequences for the school. Although science is still a core subject, they explain that the emphasis on English and mathematics (combined with the fact there are now no longer Key Stage 2 (KS2) tests in science, only teacher assessment) means that staff have taken their 'eye off the ball' with all the time and resources being put into these two subjects. CPD leaders perceive that this is certainly an issue which has got worse in recent years. For example, a CPD leader in one primary school notes that science CPD is now being 'squeezed'. Two other CPD leaders describe this view, common to CPD leaders from the primary schools, in some detail, as follows:

> [When I started teaching 14 years ago] *every subject seemed to be covered. You'd be going on a course for geography, you'd certainly be going on a course for science, art. Like I was the subject co-ordinator for art and I'd always be going on courses at the Tate. [.........]* [CPD has] *just changed dramatically [....] and then they brought in the literacy and numeracy strategy and it just dwindled down and then when the focus went off science and they no longer looked upon the KS2 SATS in terms of science, it's just teacher assessment.. there again things slip off the agenda because it is not seen as a priority. The priority has been English and maths for many years and particularly now with Michael Gove that's all that's on the agenda really.*
> (CPD leader: primary)

> [The amount of science-specific CPD undertaken] *is probably lesser at the moment. I think, and it does sound dreadful, at the moment because the year 6's are not tested for science , the science, although we do teach it, the assessment and everything has dropped from everyone's main priority. It's not an area that Ofsted homes in on at the moment and I think you will find if they did you will would find a lot more people needing and wanting more science CPD.*
> (CPD leader: primary)

If schools and FE colleges are categorised by their level of engagement with the NSLC then from Table 2.3 it can be seen that in schools and FE colleges where there is a high level of engagement a significantly higher proportion of the CPD leaders report that at least one member of staff has engaged in science-specific CPD in the last 12 months than is reported in schools with medium and low levels of engagement (low: 77 per cent, medium: 77 per cent, high: 89 per cent). Although the difference between high and low engagement schools and colleges is not surprising, it is perhaps interesting to note that there is no difference between the uptake in low and medium engagement schools.

Table 2.3 Percentage of CPD leaders reporting that at least one member of staff had engaged in science-specific CPD in the last 12 months (by level of engagement with NSLC)

Response	Level of engagement		
	Low %	Medium %	High %
Yes	77	77	89

A total of 400 respondents.
Source: CPD Leaders CATI survey 2012 Q7a

2.2.3 Priority placed on science-specific CPD

From the survey responses (as detailed in section 2.2.2) it became clear that in many schools whole school/non subject-specific CPD is more common than subject-specific. Two further points can be made here.

Evidence from the interviews across all phases of education, and from those both with Heads of Science and CPD leaders, clearly identifies that there is a hierarchy of needs in respect of undertaking CPD. Where there is a whole school need this takes precedence, and only if the school is on an 'even keel' can they take a broader approach and start considering subject-specific CPD. This is particularly evident in interviews with respondents from schools which are in challenging circumstances (in this research these were primarily schools in the primary phase). For example, a CPD leader from an intensive support school explains that the focus has been on the core priority of English and mathematics:

> *But now we are starting to improve, getting on an even keel so we are asking* [the science coordinator] *to start thinking about the science curriculum more and get it back on the agenda in a big way.*
>
> (CPD leader: primary)

Another CPD leader, also from a school in challenging circumstances, echoes this:

> *Once you've got HMI on your back then there isn't much time to do anything, but what they monitor and what they say. And there won't be for the next few years until you get another Ofsted.*
>
> (CPD leader: primary)

A CPD leader from a grammar school reports that because there are no major issues in the school the school can spend more time on subject-specific CPD.

The support of the school's, or FE college's, senior management or senior leadership team (SMT/SLT) is regarded by the Head of Science as a crucial factor in respect of whether staff can engage with subject-specific CPD. Rarely did the Heads of Science feel that SMT/SLT are actively against subject-specific CPD, rather they do not encourage it or enable time to be given to it. As two Heads of Science comment:

> *I think if you've got a middle manager who is not bothered about CPD then they don't get that time. We have to do battle constantly to get the time to do it.*
>
> (HoS focus group)

> *Over the year it's* [science-specific CPD time] *the thing that gets taken away, used for other things.*
>
> *(*HoS focus group)

Additionally, most of the Head of Science (who are all from secondary schools) reported that if a department wants to undertake science-specific CPD, particularly as a whole department, then it often has to be done in the teachers' own time and relies on the goodwill of the staff to stay behind after school:

> *... but my staff had to agree to stay an extra 1.5 hours on top of the meeting time that they had agreed in order to make that* [science-specific CPD] *a meaningful session.*
>
> (HoS focus group)

2.2.5 Decisions about attending CPD

The number, and roles, of people involved in the decisions regarding a member of staff attending science-specific CPD vary between schools. The responses from the CPD leaders' survey (Figure 2.6) indicate that science coordinators and subject leaders are the most likely people to request science-specific CPD in primary and secondary schools. In FE colleges this is significantly more likely to be individual staff or line managers. According to CPD leaders, little CPD is requested from science technicians (23 per cent in secondary school and 17per cent in FE colleges).
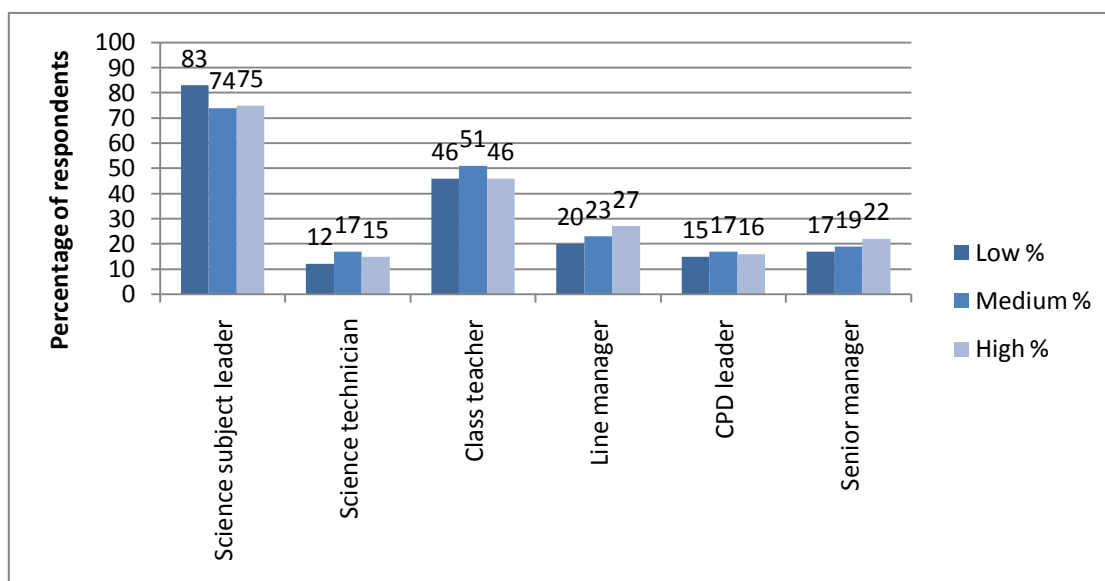
Figure 2.6 People responsible for making a request for a member of staff to undertake science-specific CPD
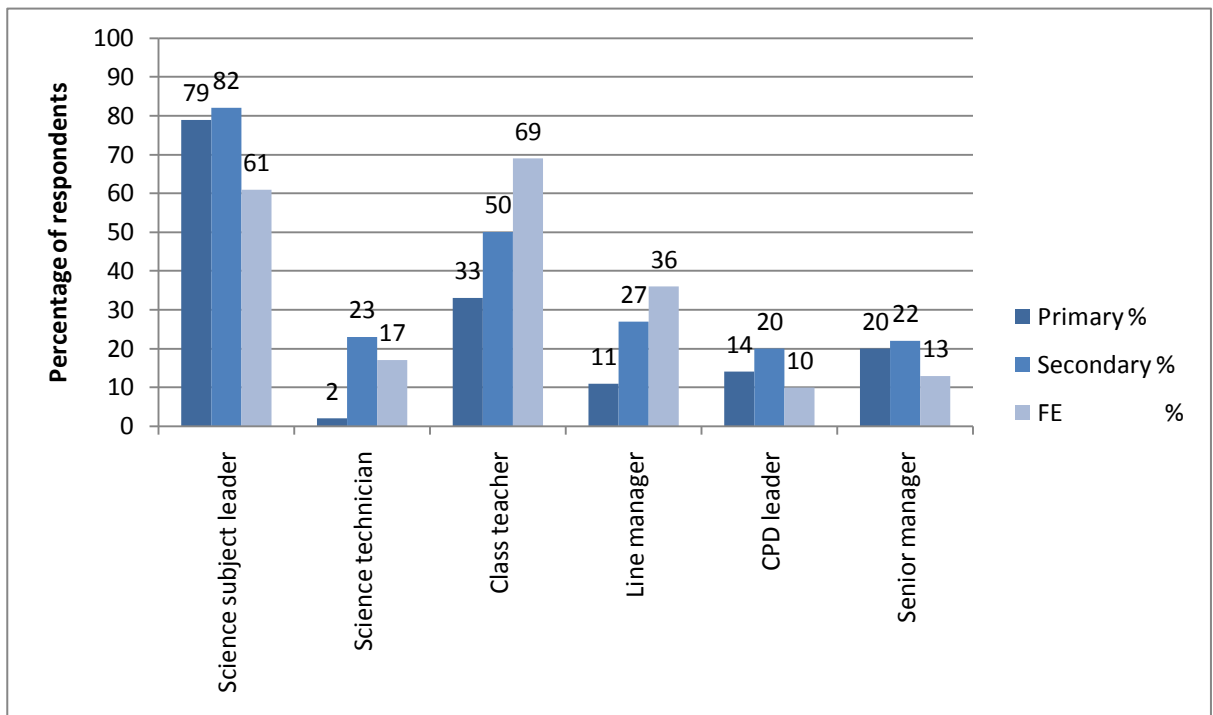
A total of 374 respondents. Respondents filtered by those who answered yes to Q7: Have any of your staff undertaken science-specific CPD in the last 12 months?
Source: CPD Leaders CATI survey 2012 Q8

There are very few variations in the person responsible for requesting science-specific CPD between schools and colleges with different levels of engagement with the NSLC , and none of the differences are significant (Figure 2.7). Slight variations can be seen. The science subject leader is more likely to request science-specific CPD in schools and colleges where there is low engagement (83 per cent) compared to schools where there is medium or high engagement (medium: 74 per cent and high: 75 per cent). In the medium engaged schools and colleges the class teacher is more likely to request science specific CPD than they are in low and high engaged schools (low: 46 per cent, medium: 51 per cent and high: 46 per cent). Requests for science-specific CPD are more likely to be made by line managers in schools with a high level of engagement than in those where there are low or medium levels of engagement (low: 20 per cent, medium 23 per cent and high: 27 percent).

Figure 2.7 People responsible for making a request for a member of staff to undertake science-specific CPD (by level of engagement with NSLC)

A total of 374 respondents. Respondents filtered by those who answered yes to Q7: Have any of your staff undertaken science-specific CPD in the last 12 months?
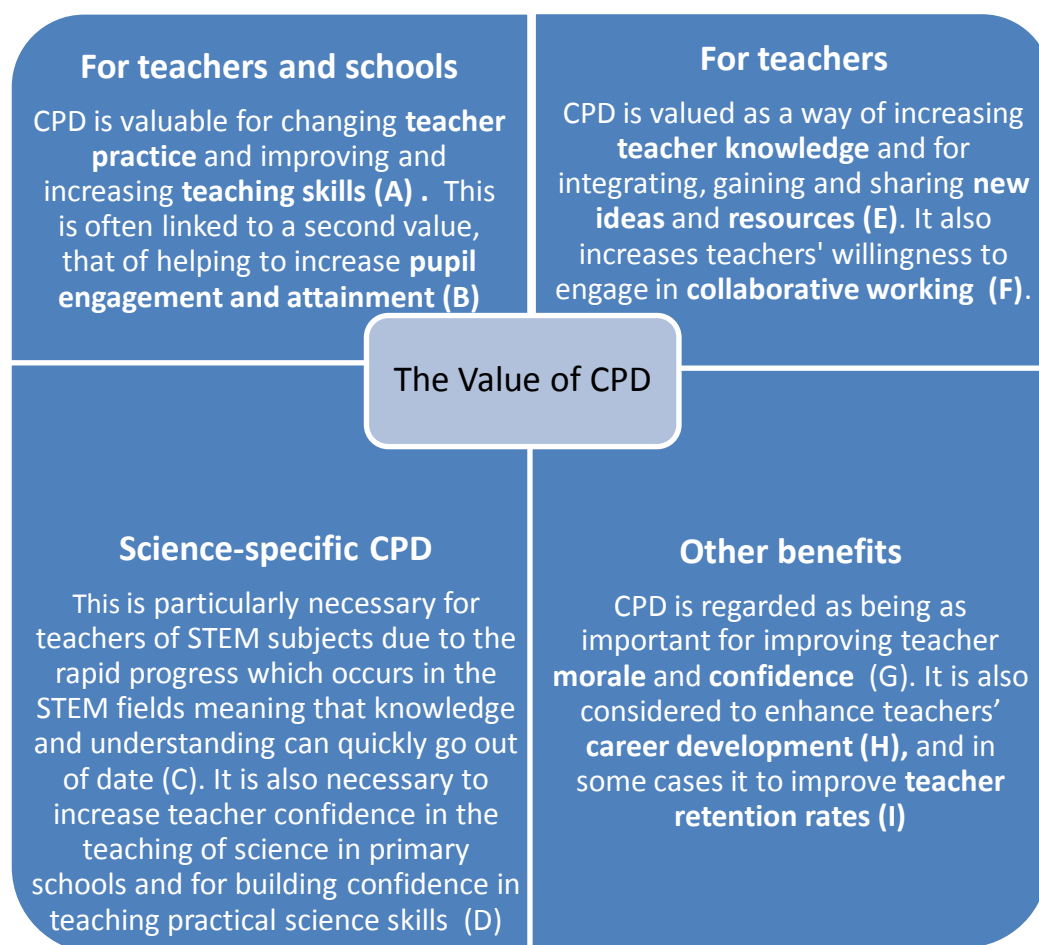*Source: CPD Leaders CATI survey 2012 Q8*

Almost all of the participants in the focus groups and the CPD leaders interviews indicate that decisions about engaging in CPD are often linked to performance management targets, which themselves are linked to the school development plan or school priorities. Although the requirement to link CPD and performance management is given in the Ofsted inspection framework, only on two occasions did CPD leaders, or Heads of Science, who participated in interviews or focus groups, make any reference to this link.

2.3 The value of CPD and science-specific CPD

This sub-section explores the value of undertaking CPD for both the school and the individual. It compares and contrasts the views of CPD leaders with those of Heads of Science and draws on evidence from the Heads of Science focus groups as well as the interviews with, and survey of, CPD leaders.

The sub-section begins with a summary of the evidence identified in the rapid review which relates to perceptions of the value of CPD. This is presented in the diagram below (Figure 2.8). (The letters in brackets relate to the references which are given at the end of the chapter).

Figure 2.8 Review of the current evidence on the value of CPD from schools and FE colleges

<table>
<tr>
<td>

For teachers and schools

CPD is valuable for changing **teacher practice** and improving and increasing **teaching skills (A)** . This is often linked to a second value, that of helping to increase **pupil engagement and attainment (B)**

</td>
<td>

For teachers

CPD is valued as a way of increasing **teacher knowledge** and for integrating, gaining and sharing **new ideas** and **resources (E)**. It also increases teachers' willingness to engage in **collaborative working (F)**.

</td>
</tr>
<tr>
<td colspan="2" align="center">The Value of CPD</td>
</tr>
<tr>
<td>

Science-specific CPD

This is particularly necessary for teachers of STEM subjects due to the rapid progress which occurs in the STEM fields meaning that knowledge and understanding can quickly go out of date (C). It is also necessary to increase teacher confidence in the teaching of science in primary schools and for building confidence in teaching practical science skills (D)

</td>
<td>

Other benefits

CPD is regarded as being as important for improving teacher **morale** and **confidence** (G). It is also considered to enhance teachers' **career development (H),** and in some cases it to improve **teacher retention rates (I)**

</td>
</tr>
</table>

2.3.1   The Value of CPD

Although there are common areas of understanding about the value of CPD for individuals and schools between CPD leaders and Heads of Science, nevertheless, there are definite differences in emphasis between these two groups.

Both Heads of Science and CPD leaders talk about the value in **updating and improving teachers' knowledge and skills,** and learning about **new innovations**. For the individual this is primarily subject related, whereas when considering the whole school respondents include wider government initiatives, Ofsted guidance and teaching and learning more generally. Heads of Science are more likely than CPD leaders to emphasise the importance of CPD for **career development** and for **building teacher confidence**.

For the CPD leaders the two most important reasons for undertaking CPD are, as has just been mentioned, **updating skills**, but also to **achieve consistency in practice** across the school. One CPD leader from an FE college encapsulates this value as: *'singing from the same hymn sheet'*. The value of using CPD to achieve

consistency in practice is highlighted in about half of the CPD leaders' interviews and yet is not mentioned by Heads of Science. Some CPD leaders refer to both consistency and improving knowledge and skills. But those CPD leaders who value consistency the most are very definite in this view and it is often the sole value of CPD to which they refer. One CPD leader explains that the value of CPD is that it:

> *enables the school to establish consistency....... what I mean by that is that we have a vision as to what outstanding teaching and learning looks like in our school and* [this] *enables me in particular understands that so I can disseminate that.* [My] *core accountability really to ensure that everyone understands what teaching and learning looks like in the school.*

(CPD leader: secondary)

2.3.2 The value of science-specific CPD

Figure 2.9 shows that the CPD leaders' survey respondents consider that the most important reasons for a teacher to undertake science-specific CPD are to improve teaching and skills (on average 74 per cent of respondents identified this reason) and to make lessons more fun (on average 69 per cent identified this reason). In FE colleges CPD is viewed as particularly important for improving and refreshing science knowledge and skills.

Figure 2.9 Reasons given by CPD leaders for staff in their school to engage in science-specific CPD
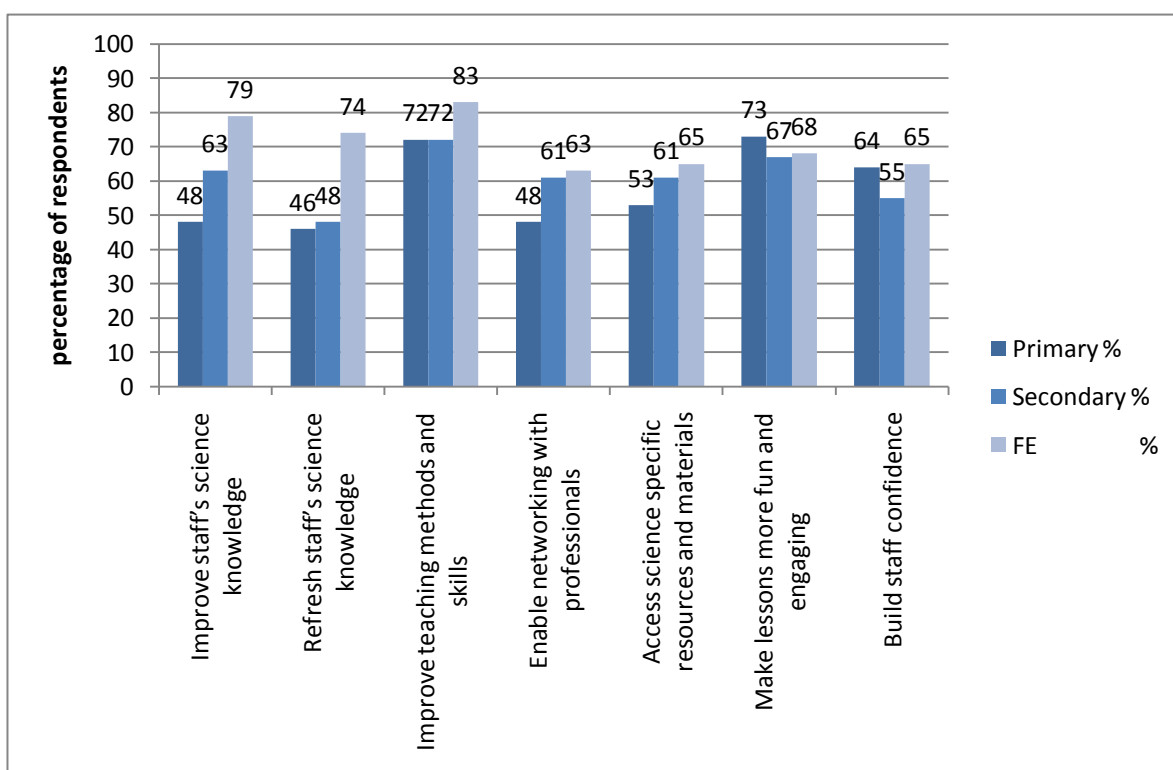
A total of 400 respondents.
Source: CPD Leaders CATI survey 2012 Q7b

These findings are broadly in line with the views of Heads of Science gathered in the focus groups and with the views of the CPD leaders who were interviewed. Common to both of these groups is an understanding that the value of science-specific CPD is related to improving teacher practice in addition to updating and extending knowledge. From the perspective of Heads of Science, engaging in subject-specific CPD is also seen as beneficial in that it gives the teacher time to reflect on their own practice and provides an opportunity for science teachers to network and learn from each other:

> *....you hear of other things happening in other schools.*
>
> (HoS focus group)

> *.....you always pick up new ideas don't you from various things people are doing, contacts they've got, ideas about coursework, assessment, exam boards, all sorts of stuff.*
>
> (HoS focus group)

Heads of Science regard their need for subject-specific CPD to be closely related to updating their knowledge and skills in a constantly changing environment. As one CPD leader comments science-specific CPD is more necessary 'simply because the boundaries are moving all the time –aren't they?' According to one Head of Science the science department is: 'not like other departments'. However, the precise ways in which they differ from other departments are not articulated clearly in the focus group responses. Most Heads of Science report that SLT/CPD leaders do not appreciate this issue which they consider to be unique to the science department. One Head of Science comments: '*I think [SLT] don't understand science*'. In contrast, the interviews with CPD leaders indicate that many of them are aware of differences and sympathetic to the particular needs of the science department in respect of CPD Many CPD leaders recognise that teachers in other subjects do not have to keep updating their knowledge and skills to the same extent as science teachers do in order for them to remain abreast of the latest scientific discoveries and technology. For example, one CPD leader explained that he used to think that scientists were able to teach all the sciences but that he is:

> *...coming to understand that when a biologist says that they need support to teach chemistry they really do need support.*
>
> (CPD leader: secondary)

The reasons given by CPD leaders in the survey about why their staff engaged in science-specific CPD showed no significant variation across the various levels of the schools' or colleges' engagement with the NSLC (Figure 2.10). Undertaking CPD to make lessons more fun and engaging, and to refresh their staff's science knowledge, is slightly more likely to occur in schools with high levels of engagement than those where the engagement level is low (lessons fun: low and medium: 66 per cent and high: 78 per cent; refresh knowledge: low and medium: 50 per cent and high: 58 per cent). Medium engaged schools are slightly more likely than schools with low and high levels of engagement to undertake CPD to enable networking (low: 57 per cent,

medium: 61 per cent and high: 54 per cent) and to access specific science resources (low: 56 per cent, medium: 63 per cent and high: 59 per cent).

Figure 2.10 Reasons given by CPD leaders for staff in their school to engage in science-specific CPD (by level of engagement with NSLC)
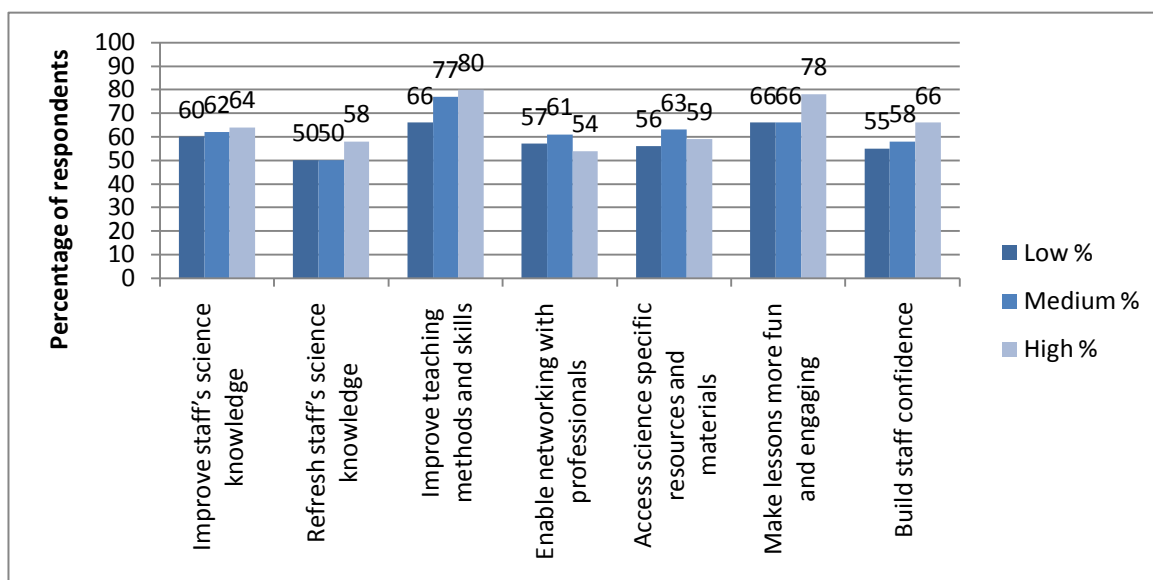
A total of 400 respondents.
Source: CPD Leaders CATI survey 2012 Q7b

2.4 Delivery of CPD in schools

This section starts by briefly considering whether the value and aims of CPD are clearly understood and communicated to staff. It then explores the different ways that CPD is delivered in schools and colleges and includes examples of what is perceived by teachers and CPD leaders to be effective and good practice.

2.4.1 Communicating the value of CPD
Most of the CPD leaders interviewed (14 respondents) consider that what the school aims to achieve through CPD, and the value of CPD, is being clearly communicated to the staff within the school and college. The Heads of Science are much less clear on the message being given by their school in this regard, although a few identify the link between CPD and the school's development:

> [CPD] *has to be linked to departmental priorities or the school's priorities.*
> (HoS focus group)

The Heads of Science' responses do not, on the whole, indicate that schools are clearly communicating the aims of CPD, or what they see are the values associated with CPD, to them.

2.4.2 The most effective form of science-specific CPD for science teachers

One of the strongest messages emerging from the responses of Heads of Science is that whatever form CPD takes it should be relevant, up to date and tailored to their individual or departmental needs. Another important criterion is that it should be able to be directly and quickly applied to science teaching. For Heads of Science non subject-specific CPD is worthwhile if time is allowed for departments to consider how it can be made relevant to them. Many of the Heads of Science and CPD leaders hold the view that staff are less willing to engage in non subject-specific than subject-specific CPD:

> *Members of staff in my department tend to be more cynical when they go along to things which aren't science-specific. If it is science-specific and they know that going into it they tend to be a lot more positive.*
>
> (HoS focus group)

2.4.3 Modes of CPD Delivery

The interviews and focus groups highlight three general ways, or modes, by which CPD can be undertaken, as follows:

- **external CPD**: where participants go out on courses run by external agencies.
- **internal (external) CPD**: in which a speaker is brought into the school, or perhaps where a visit is made to another school.
- **internal (in-house) CPD:** in which case the whole of the CPD is delivered by staff and resources within the school.

Opinions on the 'best' mode of delivery differ between CPD leaders and Heads of Science. Schools and FE colleges display a range of responses, but no patterns in the responses are found when schools and colleges are categorised either by educational phase or by level of engagement with the NSLC

External CPD

External CPD is almost universally seen as the 'best' mode of CPD by the Heads of Science who participated in the focus groups. Whilst they all have high praise for the courses run by the NSLC and regional centres, they do acknowledge that there are variations in the quality of external CPD. Most of the external CPD that they attend is science-specific and they see this mode of CPD as being relevant, up-to-date, and something which can usually be directly applied. As one Head of Science explains:

> *You don't have to spend that time putting it into context it's already there.*
>
> (HoS focus group)

In contrast, CPD leaders are less keen on this mode of CPD, although most see the value and necessity of this mode in some instances. On this point the CPD leaders made no distinction between general and science-specific CPD. In addition to the cost of the courses, some CPD leaders consider that the insights and understandings gained from this form of CPD often stay with the person, or possibly the department, and that the benefits rarely extend to others in the school. One CPD leader, from a secondary school, comments that often insights from external CPD courses: *'tend to go into a black hole and stay there'*. The low incidence of extending insights gained from CPD to others in a school could be related to another finding from this research, the absence of a rigorous system of CPD evaluation (discussed in Section 3.2).

Internal CPD

This is the mode of CPD most preferred by CPD leaders. This is not solely because of the cost, although according to a CPD leader in a secondary school cost is '*quite a limit*[ing factor]' for some schools. Several CPD leaders and Heads of Science comment that internal CPD has become much more common than it was a few years ago and, in many schools and FE colleges, it is now the predominant mode of CPD. As one CPD leader explains:

> *When we first opened* [the school seven years ago] *we used about an 80:20 split external to internal and we have just gone away from it and we are more and more convinced that the more internal we do and help to share good practice the better we get*
>
> (CPD leader: secondary)

Internal CPD, which integrates some external aspects of provision, such as the use of external speakers, is acceptable to both CPD leaders and Heads of Science. However, both comment on the variable quality of this mode. In all schools greater use is being made of peer-to-peer support including teachers visiting other schools to see good practice. This is generally regarded as being a productive activity. Primary schools in particular, are making greater use of CPD in clusters with a speaker being brought in and shared between several schools. This is not only employed as a cost-minimising measure, but also enables peer-to-peer support.

Internal CPD, which is delivered entirely in-house is generally regarded by the Heads of Science as being of poor quality; badly delivered; irrelevant; stale; and as being a cost cutting measure on the part of the school. One Head of Science described internal CPD as:

> *a waste of time'* and *'it is literally ticking a box. We have to do some training on x, therefore we will deliver it in that hour, cover everybody. Let's tick that box-done. I don't think there's enough thinking as to what the impact will be.*
>
> (HoS focus group)

Heads of Science also consider that internal CPD courses are generally perceived by teachers to be non subject-specific and therefore staff are generally less enthusiastic about participating in such CPD unless they are perceived to be of high quality. CPD

leaders appear to be less aware of this issue, and only one CPD leader comments on it in his interview. One Head of Science explains that staff in his school are*:

> *more open to science-specific [CPD], but as a long as the non-science-specific* [CPD] *is of a decent enough quality then they* [staff] *will often engage with it.*
>
> (HoS focus group)

Heads of Science are more complimentary of internal (in-house) CPD which incorporates time for departments to discuss how it can be made relevant to their subject. The importance of this is also recognised by one of the CPD leaders. In his interview, this CPD leader explained that the incorporation of subject time into internal CPD effectively overcomes any antipathy of science staff towards non subject-specific CPD.

CPD leaders perceive there is value in drawing on skills and expertise within the school, particularly in primary schools, but also feel that the CPD in this internal form can engage with the particular school's, or FE college's, needs and specific organisational context.

The fact that internal CPD is a shared experience within the school is also seen to encourage the continuation of conversations after the actual CPD and thus has longer lasting effects:

> *Not just having someone do a course... here's a handout, but what does this look like in school, on the ground. And I think it's more effective to have someone in that's in house, be working alongside. Even if it's a case of being able to phone a consultant, right I just need you to come in and work this through with me and talk to you about what we were planning on doing.*
>
> (CPD leader: primary)

In primary schools and FE colleges increasing use is being made of peer-to-peer mentoring and support and lesson study and this is seen as effective. This form of CPD is much less reported in secondary schools. In the CPD leaders' interviews seven out of eight primary school respondents and four out of five FE college respondents discussed engaging in this form of CPD, whereas only three out of six respondents from secondary schools did so. Several suggestions can be made regarding why this might be the situation, although these are not based on research findings. The first is that peer-to-peer mentoring is not regularly occurring in this educational phase. Another is that this type of interaction is occurring, but is not being recognised as CPD, possibly because in a department, such as a science department, much of this type of sharing of knowledge and skill is undertaken on an informal, ad hoc basis.

CPD in the form of peer-to-peer mentoring and support

The inclusion of peer-to-peer mentoring and support as a form of CPD is referred to in a number of the CPD leaders' interviews, particularly in primary schools and FE colleges. This type of CPD takes various forms and some examples of the way that this is being used are given below.

Example 1: Voluntary peer-to-peer coaching in a secondary school

In one secondary school the CPD leader described a peer to peer coaching programme which had been running almost continuously since the school opened seven years ago. The scheme is voluntary and is for people who are interested in improving their own teaching or progression. The CPD leader explains that the staff are paired up and

> they look at their [formal lesson] observations, they get the suggestions that have been made from their [formal lesson] observations and they set targets with that person who then observes them teach, and then they discuss the lesson and how to improve.

He goes on to say that

> The whole point of coaching is that you find the answer yourself. You are trying to get that person to see for themselves and become self-critical and self-evaluative.

He comments that it is not necessarily the outstanding teachers who make the best coaches.

Example 2: Voluntary subject learning coaches in an FE college

In an FE college the peer coaching scheme has been so successful that they have shared their expertise with other local FE colleges who have established a similar scheme. This scheme like the one describe above is voluntary, but is led by members of staff who have received coaching training. These subject learning coaches work with other members of staff, sometimes in small groups, to help them to generate ideas and to conduct their own action research project which will ultimately improve their teaching and their pupils' learning. One of the whole staff INSET days includes an opportunity for staff to inform others of their research.

Example 3: Mandatory peer coaching in a primary school

One CPD leader reports that in her school all staff are required to receive peer mentoring, but that much of it is informal in nature. Every teacher is assigned a coach who is either a member of SMT or an experienced teacher. The CPD leader explains:

> From the [official] lesson observations you might think this is what I have got to focus on, and so this is what I will work with my coach on. Or this year all of us have been given a coach for writing as that's on the development plan.

The respondent was very positive about the whole experience.

Examples of effective and good practice

Example 1: Engaging teachers in identification of CPD needs

CPD is considered to be most effective when it engages teachers and they feel some form of ownership. CPD which is commissioned without any consultation with staff is perceived to be imposed on them and less effective than CPD which originates from need(s) derived from the staff themselves (or where there is some iterative or consultative element to the design of the CPD e.g. a feedback loop). As one CPD leader explains:

> *Effective CPD is when needs are identified at grassroots level in the classroom and then we address that in what we think is the best way.*
>
> (CPD leader: secondary)

A CPD leader describes a time when the CPD priorities were decided by the CPD leader and the Headteacher as an example of the lack of effectiveness of such an approach:

> *But teachers felt it was being done to them and they didn't have as much say in it.... but unless teachers have got ownership of it, or unless they are passionate about it then they are not going to really engage. 'But if the teachers are involved in the process and are deciding where we need to go then that is hugely beneficial. That seems to be working more with the lesson study model that we are employing.*
>
> (CPD leader: primary)

Example 2: The sustainability of a programme of ongoing CPD

Teachers are aware of and sympathetic to the current financial climate and the tensions that this is bringing to schools', and FE colleges', budgets. They therefore accept to some extent the need for more CPD to be internal. Both Heads of Science and CPD leaders emphasise that CPD (both internal and external) which takes place over an extended period, and has an ongoing aspect, is better than one-off CPD. The time to apply what has been learnt, reflect on it and then revisit it is seen as very important. One-off CPD can be easily shelved due to other pressures and despite good intentions never returned to.

> *I think it's less effective if people just go out for a day. [....] Things get put to one side, oh that was brilliant, put the papers in a filing tray and that's it really.*
>
> (CPD leader: primary)

Example 3: Mixed-mode CPD

CPD which involves a mixture of modes is also seen as effective. In one primary school a project to increase the uptake and enjoyment of singing in schools employs this approach and appears to be being very well received. This programme involves a member of school undertaking external CPD combined with some on-site CPD delivery. The CPD leader explains that, in addition to the external CPD:

> *...at the same time one of their practitioners comes into school and she has done about three staff meetings sort of singing sessions, but then she has also gone into class and seen how we are delivering the programme, so it's a bit of a mixture really....'a three pronged approach.*
>
> (CPD leader: primary)

2.5 Issues around accessing science-specific CPD

In this section the barriers and issues around accessing science-specific CPD, and in some instances more general subject-specific CPD, are discussed. Almost all of the data in this section comes from the Heads of Science focus groups and interviews with CPD leaders.

The box below (Figure 2.11) outlines the key findings from the rapid literature review in relation to the barriers to accessing CPD.

Figure 2.11 Review of the current evidence on barriers to accessing CPD

> **Barriers to accessing CPD**
>
> The main barrier to accessing CPD, identified by several studies, is a **financial** one (Hustler *et al.,* 2003; Bolam and Weindling, 2006; Day *et al.,* 2006; Wellcome Trust, 2006; Varga-Atkins *et al.*, 2009; Bennett *et al.*, 2010; Lowden *et al.,* 2011; Science and Engineering Education Advisory Group, 2012).
>
> The second major issue is the **lack of time** available for undertaking CPD (Wellcome Trust, 2006; Hanley *et al.*, 2008; Varga-Atkins *et al.,* 2009; Walker *et al.*, 2011; Science and Engineering Education Advisory Group, 2012). Closely related to this, some studies highlight that teachers' heavy **workloads** often make attending courses difficult (Hustler *et al.*, 2003; Bolam and Weindling, 2006).
>
> Several studies report that teachers are **unaware of CPD opportunities** (Bolam *et al.*, 2006; Day *et al.*, 2006) or consider that the number and range of courses available are limited (Bishop and Denleg, 2006; Ofsted, 2006; Lowden *et al.*, 2011) (this finding does not solely relate to science-specific CPD). In some cases, the lack of CPD availability in certain areas is an issue which means that teachers have to travel considerable distances to attend courses (Hustler *et al.*, 2003; Bolam and Weindling, 2006). Other barriers include: the unwillingness of staff to attend CPD (Bolam and Weindling, 2006); concerns over value for money (Wellcome Trust, 2006); and the quality of the CPD courses on offer (Science and Engineering Education Advisory Group, 2012).

2.5.1 Financial Considerations

The most commonly reported, and key, barrier to accessing science-specific CPD is the **financial cost.** This is identified by both Heads of Science and CPD leaders, with many of the respondents reporting that this has recently become more acute. As two CPD leaders report:

Budgets are really stretched now.

(CPD leader: primary)

We've got to do more with less money.

(CPD leader: FE)

In many schools external CPD can only be undertaken if it is funded, as one Head of Science explains:

Unless it's funded it has to be internal.

(HoS focus group)

Heads of Science and CPD leaders both explain that in the current financial climate the **Enthuse Award** means that science staff have opportunities for undertaking science-specific CPD which other teachers do not (see additional section on the importance of this award below).

We're about the only department to go out because there is this [ENTHUSE Award]... no other department [goes out] all the rest [of the CPD] is in school.

(HoS focus group)

About a quarter of the CPD leaders interviewed were unaware of the ENTHUSE Award, with three others saying that they had heard of it, but not used it.

2.5.2 Other Barriers

The evidence highlights a number of other barriers to engaging in science-specific, or subject-specific CPD more generally. These are explored below.

- **Location:** some schools report that they are a long distance away from where courses are delivered making it difficult to attend. Due to the location of the school some external CPD providers are not always able, or willing, to deliver CPD on-site.

- **Time and need:** a lack of time means that in most of the school people can only attend subject-specific CPD courses if the course is closely related to a school need or a target highlighted in an individual's performance management review (which is itself usually related to the school development plan). As one teacher explains when discussing CPD needs: *'ultimately* [it is] *about raising the achievement of the pupils. Gone are the days when I can go and do macramé.'* (CPD leader primary).

- Some schools strictly allocate a set amount of time for CPD, but more flexibility is reported in others. As has been discussed already, Heads of Science feel that the time allocation for CPD means that lots of science-specific CPD needs to be

conducted in the staff's own time, a problem also recognised by some CPD leaders.

- **Information and availability**: CPD leaders in some schools, particularly primary schools, perceive there is a lack of information about science-specific CPD courses and opportunities, and are not aware of the range of science-specific CPD available. In primary schools this is often linked to the lack of time available to find out about the courses

> *We tend to go for the courses for* [the North of our region] *and they tend to be quite limited. [...] probably because they are the ones that are sent to us [....]Unless something comes through the post we haven't got time to go looking for it really.*
>
> (CPD leader: primary)

Two CPD leaders from primary schools perceive that this problem arose when the local authority science adviser role was abolished (due to budget cuts) as the advisers previously highlighted opportunities to schools as well as delivering CPD courses. Although in the quotation below the CPD leader is initially discussing science subjects, he explains that this problem relates to all subjects:

> *If I go back 10 years this local authority would have had an adviser for every subject. And if I had wanted say something in PE I could have been on the phone and it would have been organised, whether it was someone coming to do demonstrations or any of the CPD, now there is nobody.*
>
> (CPD leader: primary)

Both primary and secondary schools' CPD leaders comment that there seems to be less choice/availability of providers for science-specific CPD compared to other subjects. The Heads of Science did not raise this as an issue.

- **Individual staff:** both Heads of Science and CPD leaders indicate that some staff are generally unwilling to attend CPD courses. A number of personal and family commitments mean that long days, once travel time is factored in, or residential courses, can also make it difficult for staff to attend external courses.

2.5.3 Tensions

The need, and the pressure for schools and individual staff, to demonstrate high quality teaching and learning within their schools is evident in both the Heads of Science focus groups and the CPD leaders' interviews. The way that CPD is used to achieve and support this leads to very different approaches within the schools, which can become a source of tension between Heads of Science and CPD leaders/ the SLT.

For example, in two schools the Heads of Science reported that only the departments which are perceived as successful are allowed to attend external CPD, which means that staff in these departments can further improve themselves. Heads of Science from these schools perceive that if a department is doing well there is less necessity for the staff to be in the classroom all the time, and they can be released. In these

schools, staff from departments deemed as **less successful** are **restricted from undertaking the external CPD** that they see as integral to improving their results. The common justification for this is that their time will more effectively be spent working on improving results by physically being in the classroom. As two Heads of Science comment:

> *The better the results the more they get.*
>
> (HoS focus group)

> *A successful department breeds success you know . You go and ask for something from a position of power in a sense.*
>
> (HoS focus group)

In direct contrast Heads of Science from other schools report that being a **successful department** means that they are **prevented from undertaking external CPD** because they are considered not to need it, despite the fact that they would argue that the reason for their success is linked to keeping up to date. As one Head of Science explains:

> *I've only had* [refusals to go out on CPD courses] *this year and that is because the department is doing very well and they don't want anyone from my department to go on CPD because clearly we don't need it. Whereas chemistry and physics do need it but they refuse to go on it.* [The biology department needs to keep up- to- date] *that is why we are doing so well, because we are doing all this training.*
>
> (HoS focus group)

¹ **References**

Figure 2.1 Review of the current evidence on the landscape of CPD in schools and FE colleges.

(A) (Bennett *et al.*, 2010)

(B) (Hustler *et* al., 2003; Bolam and Weindling, 2006)

(C) (Hustler *et al.*, 2003; Bishop and Denleg, 2006; Bolam and Weindling, 2006; Jones *et al.*, 2008; Robinson *et al.*, 2008; Bennett *et al.*, 2010; Science and Engineering Education Advisory Group, 2012)

(D) (Hustler *et al.*, 2003; Bolam and Weindling, 2006; Day *et al.*, 2006; Martin, 2006)

(E) (Burn *et al.*, 2007)

(F) (Ofsted, 2006; Walker *et al.*, 2011)

(G) (Hustler *et al.*, 2003)

(H) (Bolam and Weindling, 2006)

(I) (Gray and Bryce, 2006; Ofsted, 2006; Burn *et al.*, 2007, Hanley *et al.*, 2008; Varga-Atkins *et al.*, 2009)

(J) (Bolam and Weindling, 2006; Day *et al.*, 2006; Gray and Bryce, 2006; Ofsted, 2006; Burghes and Robinson, 2009)

(K) (Hustler *et al.*, 2003; Bolam and Weindling, 2006; Ofsted, 2006; Varga-Atkins *et al.*, 2009)

(L) (Bishop and Denlag, 2006; Bolam and Weindling, 2006; Wellcome Trust, 2006)

(M) (Bishop and Denleg, 2006; Wellcome Trust, 2006)

Figure 2.6 Review of the current evidence on the value of CPD from schools and FE colleges

(A) (Hustler *et al.*, 2003; Bolam and Weindling, 2006; Gray and Bryce, 2006; Ofsted, 2006; Murphy *et al.*, 2007; Varga-Atkins *et al.*, 2009; Bennett *et al.*, 2010; McGregor and Woodhouse, 2010; Lowden *et al.*, 2011; Walker *et al.*, 2011)

(B) (Hustler *et al.*, 2003; Bolam and Weindling, 2006; Martin, 2006; Ofsted, 2006; Murphy *et al.*, 2007; Jones *et al.*, 2008; Varga-Atkins *et al.*, 2009; Bennett *et al.*, 2010; McGregor and Woodhouse, 2010; Walker *et al.*, 2011)

(C) (McGregor and Woodhouse, 2010; Science and Engineering Education Advisory Group, 2012)

(D) (Murphy *et al.*, 2007; Jones *et al.*, 2008; Bennett *et al.*, 2010)

(E) (Burghes and Robinson, 2009; McGregor and Woodhouse, 2010; Science and Engineering Education Advisory Group, 2012)

(F) (Bolam and Weindling, 2006; Gray and Bryce, 2006; Burghes and Robinson, 2009)

(G) (Hustler *et al.*, 2003; Martin, 2006; Ofsted, 2006; Murphy *et al.*, 2007; Jones *et al.*, 2008; Joubert *et al.*, 2008; Burghes and Robinson, 2009; Varga-Atkins *et al.*, 2009; Bennett *et al.*, 2010; McGregor and Woodhouse, 2010; Lowden *et al.*, 2011)

(H) (Lowden *et al.*, 2011; Wellcome Trust, 2006; Hustler *et al.,* 2003; Burghes and Robinson, 2009)

(I) (Bishop and Denleg, 2006; Bolam and Weindling, 2006; Ofsted, 2006)

3. Evaluation of CPD

Key findings

The extent to which CPD is evaluated
- Most schools are evaluating CPD, although this occurs to varying extent across schools and there is generally an absence of a systematic approach to evaluation.
- There is a misconception amongst some interviewees on the distinction between evaluation and dissemination.
- The typical aspects of CPD being evaluated are staff satisfaction, value for money and impacts on teaching practice. There is limited evidence of evaluation relating to the impacts of CPD on pupils.

How is CPD evaluated
- Evaluation forms are the most common method of evaluating CPD and the evaluation process mainly occurs through performance reviews/staff appraisals, lesson observations and learning walks and through informal discussions/ peer-to-peer support.
- Evaluations are conducted by a variety of people within the school and FE college, including CPD leaders, members of the Senior Management Team, line managers and Heads of Departments. The people involved depend on the evaluation method used.

Outcomes being evaluated
- The main CPD outcome being evaluated is impact on teaching practice, primarily through an assessment of increases in teacher confidence and skills.
- Where limited attempts have been made to evaluate pupil outcomes, this is primarily evidenced through improved teacher practice and a perceived 'knock-on' effect on pupils.
- There is a widespread lack of understanding on how to approach the evaluation of the impact of CPD on pupils.

3.1 Introduction

This chapter begins with a short review of the evidence gathered from a rapid review of the literature relating to current understandings and practice around the extent to which schools evaluate CPD, how evaluation is conducted and what is being evaluated (Figure 3.1). It also draws on the CPD leaders' CATI survey data in addition to data gathered via focus groups and interviews with headteachers and teachers which explored the extent to which schools are evaluating CPD, the approaches they are using and the outcomes that are being evaluated.

Figure 3.1 Review of the current evidence on the evaluation of CPD in schools and FE colleges

Evaluating CPD

Very little research has been conducted in the area of evaluating CPD and consequently there is a paucity of literature in this area. The evaluation of CPD is an area which is perceived to be poorly developed and in which training for both staff and CPD leaders is needed (Hustler *et al.,* 2003; Bolam and Weindling, 2006; Ofsted, 2006). The Ofsted report (2006) highlights a failure of schools to identify intended outcomes and suitable evaluation methods at the planning stage and Bolam and Weindlings' (2006) review of key messages from research into teacher CPD highlights that within schools, dissemination is often confused with evaluation. Evidence about the extent to which CPD is evaluated within schools is contradictory with some research reporting that CPD is often evaluated (Robinson *et al.*, 2008; Walker, 2011), whereas other studies have found evaluation to be rarely taking place (Science and Engineering Education Advisory Group, 2012), particularly in the area of pupil achievement (Ofsted, 2006, Thurgood *et al.* 2013).

What is being evaluated?

Very little research has focussed on what is being evaluated. Bolam and Weindling (2006) find three main outcomes being evaluated; value for money, staff satisfaction with the course and the use of the new knowledge and learning obtained from the course. Some research (Robinson *et al.*, 2008; Walker, 2011) does report that schools are evaluating CPD in terms of pupil impact and there is a suggestion that this has increased over time (Robinson *et al.,* 2008). However, teacher impact is considered to be easier to evaluate than pupil impact and the latter is less frequently shown to be an outcome which was evaluated (Bolam and Weindling, 2006).

How is it being evaluated?

Three methods of evaluation are most frequently reported as being used within schools; questionnaires (Bolam and Weindling, 2006; Martin, 2006), peer observations (Martin, 2006; Ofsted, 2006) and Performance Management Reviews,   with staff reflecting on the impact CPD has made primarily on practice (Robinson *et al.*, 2008; Walker *et al.*, 2011). Other methods mentioned include the development of portfolios and discussions (Martin, 2006).

3.2 The extent to which CPD is evaluated

Most headteachers and teachers responding to the CPD leader CATI survey indicate that they are *always* **evaluating the impact of CPD**, as illustrated in Figure 3.2 below. Similarly, focus groups and telephone interviews with CPD leaders also suggest that many schools are actively engaged in evaluating the impact of CPD, although this has occurred to varying extent across schools. This is reflected by over a third (37 per cent) of survey participants who indicate that they only evaluate CPD *sometimes.*

Figure 3.2 Frequency with which schools and colleges evaluate the impact of CPD
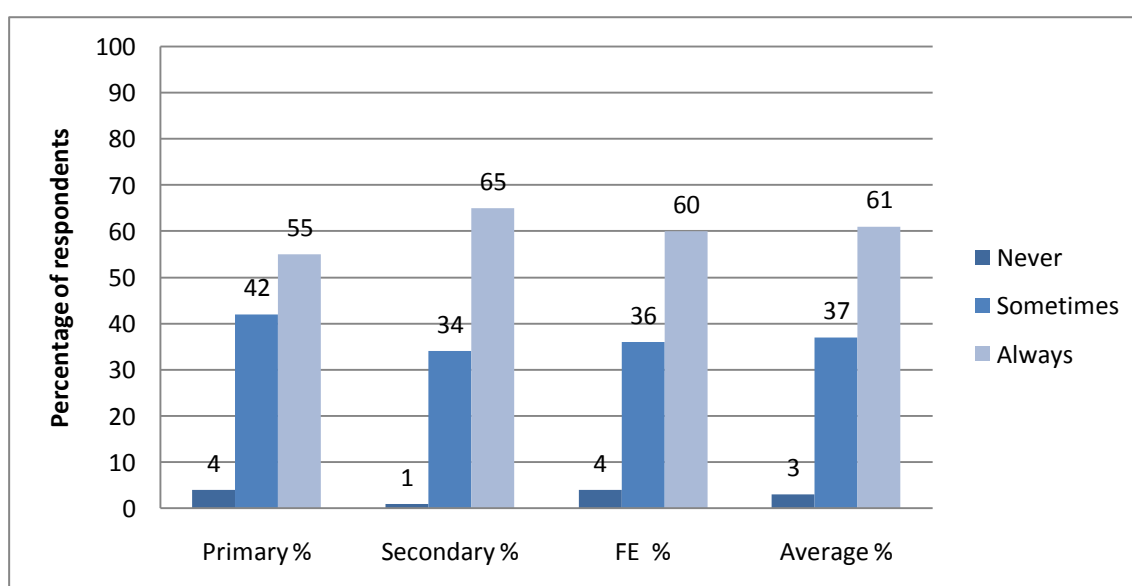
 A total of 400 respondents.
Source: CPD Leaders CATI survey 2012 Q6

The responses from the CPD leaders' survey, shown in Table 3.1 below, indicate that schools and FE colleges with low levels engagement with the NSLC are less likely to always evaluate CPD than schools and colleges with high and medium levels of engagement, although this difference is not significant (low: 55 per cent, medium: 65 per cent, high: 62 per cent).

Table 3.1 Frequency with which schools and colleges evaluate the impact of CPD

Response	Level of engagement		
	Low %	Medium %	High %
Always	55	65	62
Sometimes	42	32	37
Never	3	3	2

A total of 400 respondents.
Source: CPD Leaders CATI survey 2012 Q6

Interviews with CPD leaders suggest that the lack of a systematic approach to evaluating CPD appears to be due to a misconception amongst some interviewees between **evaluation and dissemination**. Where this distinction is not being made, the evaluation of CPD in some schools is being approached as a dissemination exercise related to sharing good practice with colleagues. For example, one interviewee explains that '*the extent of that evaluation becomes very conversational in that it is about how useful* [CPD] *was'* [CPD leader: secondary]. While dissemination of good practice represents an important aspect assessed within evaluations, the evidence suggests that in some cases, the priority given to dissemination is preventing some schools from adopting a more critical and systematic approach to evaluating outcomes and scrutinising the impact of CPD on teachers and pupils.

3.3 How is CPD evaluated?

Schools are employing a range of methods to evaluate CPD, and similar methods are highlighted across both the survey and interview data. Interviewees report that overall, school-wide approaches to evaluating CPD are being adopted. However, some interviewees comment that different approaches are being taken across departments, particularly in relation to the evaluation of subject-specific CPD.

As shown in Table 3.2 below, the most common frequently occurring method of evaluation is either through performance management or informal meetings and discussions.

Table 3.2 Methods used to evaluate impact

Method	Phase of education			
	Primary %	Secondary %	FE %	Average %
During performance management	89	89	78	87
Through informal meetings and discussions	83	81	82	82
As part of performance review (support staff)	74	77	81	77
During departmental/curriculum meetings	65	85	79	77
Through gathering student/pupil views on staff practice	42	53	61	51
Other	15	24	17	18

Due to rounding, percentages may not sum to 100
A total of 390 respondents. Responses filtered by those answering frequently or sometimes to Q6 (Does your school/college evaluate the impact of CPD?)
Source: CPD Leaders CATI survey 2012 Q6b

As Figure 3.3 shows, the school or college's level of engagement with the NSLC makes little difference to the method used by the school or college to evaluate the impact of CPD and none of these differences are significant. Departmental meetings are less likely to be used to evaluate impact in high engagement schools and colleges compared to low and medium engagement schools and colleges (low: 77 per cent, medium: 82 per cent, high: 71 per cent), and informal discussions and meetings are more likely to be used in schools and colleges with low engagement (86 per cent) than in those with high or medium levels of engagement (medium: 70 per cent and high: 78 per cent).

Figure 3.3 Methods used to evaluate impact
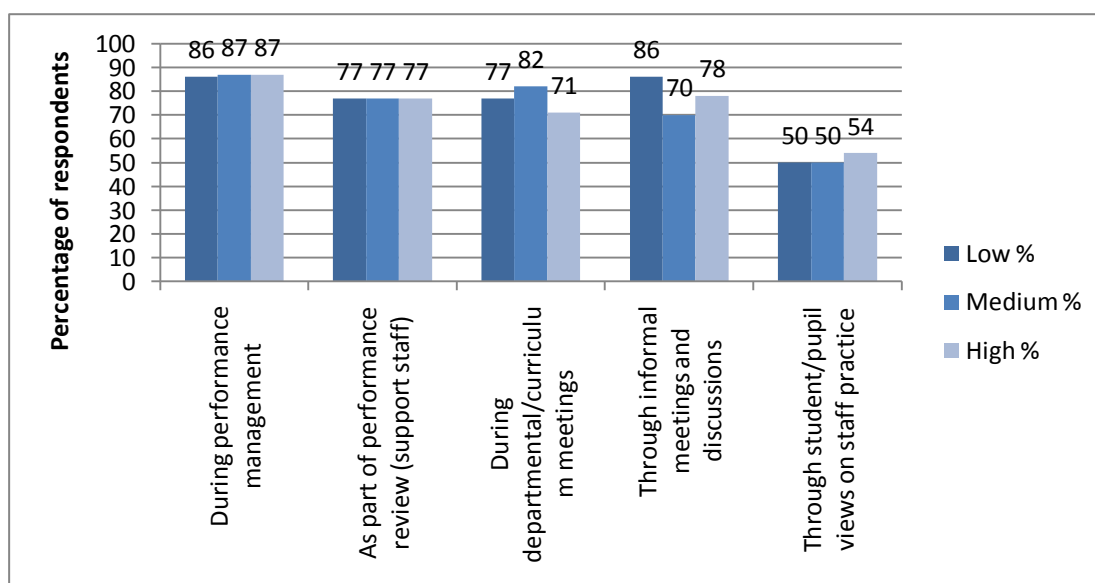
Due to rounding, percentages may not sum to 100
A total of 390 respondents. Responses filtered by those answering frequently or sometimes to Q6 (Does your school/college evaluate the impact of CPD?)
Source: CPD Leaders CATI survey 2012 Q6b

CPD evaluations are conducted by a variety of people and precisiely who is involved varies between schools and FE colleges. The people involved depend on the evaluation method used, and can include CPD leaders, members of the Senior Management Team, line managers and Heads of Departments.

A large majority of interviewees report using **evaluation forms** to assess and evaluate both staff satisfaction with CPD and teachers' experiences of CPD. Teachers are typically required to complete forms both before and after attending training, initially to register interest in a particular course or outline their CPD objectives, and later to feed back on their experiences. In some schools, interviewees report that evaluation forms are comprehensively completed, provide a good record of training, highlight the values and drawbacks of courses, and support the evaluation of CPD on teaching outcomes. Other interviewees comment that the forms sometimes contain one word answers, are not well-completed, or are seen as

'tick-box' and 'paper exercises', which are infrequently followed up. The comments below from two interviewees highlight evaluation approaches that are less effective:

> *In terms of satisfying the school you will find a form in your pigeonhole and you fill it in, say what you thought of the course and what your next steps are, but no-one is going to check that you have done that.*
>
> (CPD leader: secondary)

> *We fill in these forms but I don't think anything happens from there.*
>
> (HoS focus group)

Many schools are also using **teacher appraisals and reviews** to discuss and evidence the impact of CPD on teaching outcomes, a finding also reflected in the survey data. Some schools report visiting CPD objectives through performance management with staff at least termly, in order to evaluate impact. In one school, staff are required to link their CPD objectives with their performance management targets in order to attend training: *'any training needs to be linked back to one of their PM targets and if they can't do that then it is not approved'* [CPD leader: FE]. A staff development officer outlines some of the typical questions staff are asked during appraisals in order to evaluate training, such as how staff feel CPD has changed their practice and how this has affected pupils.

Lesson observations, **learning walks** and **lesson study** exercises are being undertaken in some schools to evaluate the impact of CPD on teaching practice. These involve colleagues observing and feeding back on each other's classroom practice in order to identify changes in practice and the extent to which new resources or ideas are being incorporated into schemes of work following course attendance. Some interviewees report using these approaches as a way of identifying strong teaching practice and the features of outstanding lessons, which are then shared with other staff.

Informal discussions with colleagues and **peer-to-peer support**, through mentoring or coaching are reported as useful methods for ongoing evaluation of teaching practice, particularly for internal CPD. This is also the second most frequently cited process of evaluation highlighted in the CATI survey. A Deputy Headteacher outlines one schools approach:

> *If there's something that comes through about how to be a better Head of Department, that's not best done on a one day course, it's much better done buddying them up with a mentor in another school or the same school, getting them to shadow and be coached...it doesn't produce an instant change but the change in confidence over time is better.*
>
> (CPD leader: secondary)

3.4 What outcomes are being evaluated?

Where schools are going further than dissemination and are evaluating CPD, there is some variation in the aspects of CPD that are being evaluated. Most interviewees are frequently evaluating course content and resources, staff satisfaction and the value for money aspect of CPD. In their interviews CPD leaders report that the evaluation of teaching outcomes is being undertaken less frequently than other forms of evaluation. Nevertheless over half of interviewees have made some attempts to evaluate teaching practice..Evaluating the impact on pupils is felt to be more challenging and most schools are not directly measuring pupil outcomes. Interviewees expect improvements in teaching outcomes to have a 'knock-on' effect on pupil outcomes, and it is their view that any positive impacts on teaching practice will eventually impact on improvements in pupil performance. This is further explained by a Deputy Headteacher:

> *Pupils performance impact wouldn't be about 'all my grade C's have suddenly become grade A's', because obviously that takes too long to prove and you could never link it to just the impact of one course, because it won't just be that that does the trick, it will be a whole load of other things. It would be largely change in teaching practice which then obviously does impact on results eventually.*
>
> (CPD leader: secondary)

> *Teaching and learning is at the heart of everything and we believe that our results come from that. But it boils down to results at the end which is how are we going to enrich* [the students]…*we believe the best way to do that is through outstanding teaching.*
>
> (CPD leader: secondary)

The findings from the CPD leaders' survey do not fully support the findings from the CPD leaders' interviews. As can be seen in Table 3.3, below, in the survey a large majority of CPD leaders report **that they are evaluating impact on pupils/students.** The survey and interview data do not necessarily contradict each other and it is likely that, as explained previously, pupil outcomes are being evidenced through impacts on teacher outcomes.

Table 3.3 The CPD outcome being evaluated

Outcome evaluated	Phase of education			
	Primary %	Secondary %	FE %	Average %
Impact on pupils/students	89	87	83	87
Impact on staff practice	80	88	83	84
Knowledge and skills of staff	67	71	83	72
Staff satisfaction	43	42	60	46
Other	5	16	7	10

Due to rounding, percentages may not sum to 100
A total of 390 respondents. Responses filtered by those answering frequently or sometimes to Q6 (Does your school/college evaluate the impact of CPD?)
Source: CPD leader CATI survey 2012 Q6c

Which CPD outcome is being evaluated varies little with the schools' or colleges' level of engagement with NSLC. As is shown in Table 3.4 below, there are minimal variations between the levels of engagement and the proportion of schools evaluating the outcomes, none of which are significant.

Table 3.4 The CPD outcome being evaluated (by level of engagement with NSLC)

Outcome evaluated	Level of engagement		
	Low %	Medium %	High %
Impact on pupils/students	85	81	86
Impact on staff practice	71	72	72
Knowledge and skills of staff	90	85	86
Staff satisfaction	48	48	49
Other	9	12	9

Due to rounding, percentages may not sum to 100
A total of 390 respondents. Responses filtered by those answering frequently or sometimes to Q6 (Does your school/college evaluate the impact of CPD?)
Source: CPD leader CATI survey 2012 Q6c

Interviewees report that most CPD outcomes are likely to be qualitative and therefore difficult to measure, but are however, easily recognised in the context of changes to individual teacher performance. One primary school CPD leader emphasises the fact that evidence on outcomes following CPD could be, but not limited to, changes in data, practice, learning environments, effective questioning, pupils becoming more autonomous in the classroom, or the use of different resources, all of which were said to be '*ultimately about raising the achievement of pupils'.*

Interestingly, many interviewees report that schools do not always expect to evaluate the outcomes of all CPD courses undertaken, and that evaluation approaches are dependent on the type of CPD undertaken. For example, where non subject-specific CPD, such as leadership courses are undertaken, staff do not expect to see discernible impacts on teachers or pupils. The extent to which the effects of improvements to senior leaders' leadership skills are evidenced is said to vary across individuals and their specific objectives. One interviewee further explains: '*I talk to individuals about…what changes are you expecting to notice in your own practice…I wouldn't want to say that everything ought to be measured in the same terms because it does vary very much'* (CPD leader: secondary).

3.4.1 Impacts on teaching outcomes

Increased confidence
The most frequently identified impact of CPD on teaching outcomes is **increased teacher confidence**. Interviewees consider that the positive effect of CPD on teachers' confidence is sometimes a longer-term impact, but one which tends to have a positive effect on practice, and therefore teaching delivery, as outlined below by the comment below:

If you've got a teacher who isn't particularly confident, I'm thinking specifically about a physics teacher who is teaching maths, who we sent to another school to look at maths teaching. Just so that he could actually think, no I'm OK; I'm alright as a maths teacher. And that's a longer impact, it's slower burn but well worth doing.

(CPD leader: secondary)

Longer-term outcomes, such as increased confidence, are being tracked through staff appraisals, and some interviewees report the related benefits of positive shifts in teachers' thinking and a more proactive approach to their subject.

Increased skills

Around half of interviewees report using lesson observations and learning walks as a way of assessing and evaluating **increased skills** following CPD. This approach incorporates peer-to-peer discussion, and a minority of schools also report using this method to support teachers in moving from the delivery of 'good' to 'outstanding' lessons. Interviewees comment that following CPD, the impact and progress towards specific skills, such as improved questioning techniques, can be evidenced in the short term, and teachers are able to draw visibly improved results from pupils. The examples below demonstrate how two teachers approach the evaluation of these outcomes.

Some of the courses my staff have been on have been about total participation techniques, engaging learners, open questioning. So then we will have done learning walks to see if this is happening in practice. Looking at schemes of learning – are these activities being included in schemes of learning?

(HoS focus group)

When I walk into the room, is everything there that we have agreed that is conducive to good learning, can I see it in evidence, can I see effective evidence and planning? When I do observations am I seeing good and outstanding lessons?

(CPD leader: primary)

3.4.2 Impacts on pupil outcomes

As previously discussed, a systematic approach is not being taken to evaluating pupil outcomes and there is a widespread lack of understanding and awareness amongst interviewees in relation to how to measure pupil impact. One interviewee explains that, despite having to demonstrate that subject-specific CPD undertaken within their science department has had an impact on pupil attainment, no guidance has been provided on how to approach this:

I haven't worked out how on earth I am going to do it. I've been given no advice as to how to do it. I have been told that I have to show that CPD is improving pupil attainment in my department.

(HoS focus group)

A Headteacher explains that their school has attempted to evidence outcomes on pupil attainment by '*looking at year 7 and comparing it to year 7 last year – has there been an increase in 5c and above?*' The interviewee does not elaborate on how any improvements in pupil attainment will then be linked to a particular CPD course, or intervention, which is one of the primary challenges in evaluating pupil outcomes acknowledged by interviewees.

The following example outlines the approach of one school to evaluating pupil outcomes following school-wide phonics CPD.

> ### *Improved pupil outcomes in phonics*
> Phonics was highlighted by Ofsted as an area of weakness within a three-form entry primary school. Following the identification of gaps in teaching practice, school-wide CPD was undertaken by all teaching staff. As a result of CPD, there has been an improvement in teachers' knowledge and delivery of phonics, which is being demonstrated and observed through teaching practice. Evidence of changes in pupil outcomes is being observed across the school through improved attitudes to learning, an increase in understanding and awareness of phonics amongst pupils, and improved individual results. The school also plan to use evidence from their next Ofsted report as part of the evaluation of CPD.

Despite schools not actively collecting evidence on pupil outcomes, the interviews suggest an increasing awareness amongst some interviewees that there will be an increased requirement for schools to evidence this within the new Ofsted framework, suggesting that schools require further clarity on how to approach the evaluation of CPD.

4. Conclusions and Recommendations

4.1 Conclusions

Overall, this research has found that, while the uptake of CPD is widespread across schools and FE colleges, the amount of science-specific CPD undertaken varies from institution to institution. The proportion of CPD which is science-specific depends on a school's, or FE college's, assessment of what wider improvements are considered necessary across the whole institution.

Our findings suggest that CPD leaders and Heads of Science hold different perspectives on the management of CPD provision within their school or FE college. For example, CPD leaders consider communications about the aims and value of CPD within their school or FE college to be clear. However, Heads of Science commonly express a need for a clarification of the messages regarding the strategy for CPD in their institution.

According to CPD leaders, and to some extent Heads of Science, CPD is most effective when it is based on a 'bottom-up' approach to the identification of CPD needs and is shaped by consultation with teaching staff. However, different views were reported on the most effective *location* for the provision of CPD. CPD leaders interviewed for this research consider internal CPD to be the most effective form, as it is bespoke to the school or college needs, and this is increasingly schools'/colleges' first choice of CPD provision. In contrast, Heads of Science regard external CPD as the most effective type of provision and emphasise its value in relation to their need for CPD which has a direct and immediate application to their specific subject teaching.

Staff participation in CPD is evaluated to varying degrees and the evidence highlights an absence of a systematic approach to evaluation, across both schools and FE colleges. This is likely to become an increasingly urgent issue to address in future given recent changes to the Ofsted Framework which emphasise the importance of the links between CPD to performance management, teaching and pupil attainment.

Misconceptions of the distinction between evaluation and dissemination are frequent and these terms are often used interchangeably. Where CPD is evaluated, evidence is most commonly captured through the performance management system. To a lesser degree, schools and FE colleges use lesson observations and learning walks, peer-to-peer support and informal discussions. Typically, evaluation of CPD focuses on aspects of teaching practice, particularly increases in teacher confidence and skills. Evaluation evidence of the impact of CPD on pupils is very scarce and there is a corresponding lack of understanding (among both CPD leaders and Heads of Science) of what approaches can be used to assess the impact of CPD on pupils. Progress in this area is urgently required to enable schools and FE colleges to

demonstrate the impact of CPD on learners' behaviour, progress and quality of learning, an explicit requirement introduced in the recently revised Ofsted Framework.

A school or college's level of engagement with the NSLC appears to be unrelated to the decisions that CPD leaders make about undertaking CPD (in particular science-specific CPD), evaluating CPD, or the form that any CPD takes. The only significant difference, in relation to levels of engagement is that it was more likely that a member of staff had undertaken science-specific CPD in the past year in high engagement schools, than in schools or colleges with low or medium levels of engagement. This suggests that decisions about all aspects of CPD will vary between schools and FE colleges depending on a number of different factors and that it is not possible to distinguish such decisions solely based on their levels of engagement with the NSLC.

4.2 Recommendations

The findings of this research highlight a number of opportunities to improve engagement in science-specific CPD and the evaluation of its impacts, particularly on pupils. A number of recommendations for the National Science Learning Centre, as well as schools and FE colleges, are outlined below.

Recommendations for **Myscience and the National and Regional Science Learning Centres:**

- **Provide continued support for schools and FE colleges to ensure that both external and internal/on-site CPD are of a high quality and is relevant to science teachers.**
  Heads of Science regard much internal CPD as of poor quality and as failing to meet their requirement for it to be immediately applicable to their subject teaching. The increasing use of on-site delivery of CPD means that there is a growing need for a continuation of the network of Science Learning Centres' outreach work. Support which facilitates, and encourages, schools and FE colleges to improve the delivery, and increase the relevance, of CPD which is delivered within the school or college would be particularly helpful to so that science teachers' needs are adequately met. For example, this could include the development of CPD programmes which employ a mixed mode of delivery and/or which encourage CPD where the needs are identified through a more 'bottom-up' approach.

- **Provide guidance to help CPD leaders and teachers to recognise existing, and potential, ways of collecting valid and robust evidence of impact from CPD within their school and assessing the impact of CPD on pupils' learning**.
  There is a clear need for additional information and support to be given to schools and FE colleges regarding how CPD can be evaluated and what constitutes robust evidence of impact on pupils. There is an opportunity for

Myscience, and the National and Regional Science Learning Centres, to provide this guidance and support. Guidance and support is particularly required in two areas. The first is in helping the CPD leaders and science teachers recognise what sort of data, including that which is already being routinely collected in schools, can be used as evidence to demonstrate the impact of CPD on pupils. Secondly, it is to provide CPD leaders and science teachers with an understanding of how to obtain more evidence of impact as well as to help them in identifying appropriate methods of collecting and analysing evidence. The development of a toolkit, which Myscience/NSLC are in the early stages of considering, to help teachers in the above respects would support this.

- **Recognise that schools and colleges have similar attitudes towards the value placed on science-specific CPD, and towards prioritising CPD in one curriculum area over another, irrespective of previous levels of engagement with the network of SLCs**.
  Previously low levels of engagement with NSLC are not necessarily barriers to future engagement. Therefore, strategies to increase schools' and colleges' level of engagement with NSLC should focus more on the whole-school context and the range of school-specific or physical factors which may affect decisions about choice of CPD (such as areas of weakness identified by Ofsted reports or distance from the National and Regional Science Learning Centres), rather than a perceived need to change schools' and colleges' views towards the value of science-specific CPD.

Recommendations for **schools and colleges** include:

- *CPD leaders* **could usefully consider how to incorporate a more 'bottom-up' approach to the identification of CPD needs within their current CPD planning processes**.
  Heads of Science **could encourage their staff to share identified CPD needs, but also good practice in the area of evaluating the impact of CPD on pupils' achievement.**
  A more 'bottom-up' approach to the identification of CPD needs is perceived to be effective and more likely to lead to a sustainable, evolving development process for teaching staff.   This research evidences that this approach would be welcomed. It may be a particularly relevant approach if science teachers consider themselves to operate in a field where the rate of change means they have a pressing need to keep up-to-date with the latest developments e.g. in technological advances and/or the latest scientific discoveries. Encouraging staff involvement in the identification of CPD needs and to share what improvements have been observed since attending CPD would offer meaningful ways to engage staff in selecting appropriate future CPD and to reflect on its value to their teaching practice and to pupils' progress.

- ***CPD leaders* need to consider how to articulate the vision for, and purpose of, CPD at a number of different levels within their school or FE college.**
  There is evidence that Heads of Science are unclear about the aims and objectives of CPD undertaken by staff in their school or FE college; a view which contrasts with that of CPD leaders. To ensure that there is a common understanding of the purpose of CPD, schools and FE colleges should review how they communicate the vision and strategy for CPD in their schools. For example, schools and FE colleges could explicitly state the balance of subject-specific compared to non subject-specific CPD which the establishment aims to undertake that academic year. A review could also include a consideration of what constitutes appropriate communication at several levels within the school. For example, schools and FE colleges may need to consider the communication which would be appropriate at a 'whole-school' level compared to what may be appropriate at the 'subject leader' level.

- ***CPD leaders* should provide examples of how attendance at subject-specific CPD can be evaluated and what kinds of impact on pupils' achievement can be expected as a result.**
  ***Heads of Science* should provide teachers with opportunities to share their views about pupils' achievement, and their incremental improvements, on a more frequent basis.**
  These recommendations are dependent on CPD leaders and science teachers both embracing the first two of the recommendations for schools and colleges given above. Providing science teachers with more examples and guidance on what methods can be used to evaluate the impact on pupils' achievement, motivation and engagement as a result of engagement in CPD, and how it can be evidenced, will build the science teachers' confidence in this area. It will also help in communicating to staff the value which the school places on CPD and facilitate the dissemination and application of newly-acquired knowledge, skills and good practice to other teaching staff. CPD leaders who choose to engage teachers at a subject (or school-wide) level in identifying CPD needs will benefit from the more consistent, school-wide understanding of the purpose and aims of their institution's CPD strategy and thus the outcomes and impact expected.

References

Bennett, J., Braund, M. and Lubben, F. (2010). 'The impact of targeted CPD on teachers' professional attitudes and classroom practice.' Paper presented at the International Seminar 'Professional Reflections', National Science Learning Centre, York, February [online]. Available: https://www.sciencelearningcentres.org.uk/impact-and-research/research/research-seminars/NSLC%20UYSEG%20seminar%20Bennett.pdf [27 February, 2013].

Bishop, K. and Denleg, P. (2006). 'Science learning centres and governmental policy for continuing professional development (CPD) in England', *Journal of In-service Education*, **32**, 1, 85–102.

Bolam, R. and Weindling, D. (2006). *Synthesis of Research and Evaluation Projects Concerned with Capacity-building through Teachers' Professional Development.* Birmingham: General Teaching Council for England [online]. Available: http://dera.ioe.ac.uk/7318/1/full_report [27 February, 2013].

Burghes, D. and Robinson, D. (2009). *Lesson Study: Enhancing Mathematics Teaching and Learning.* Reading: CfBT Education Trust [online]. Available: http://www.cimt.plymouth.ac.uk/papers/lessonstudy.pdf [27 February, 2013].

Burn, K., Childs, A. and McNicholl, J. (2007). 'The potential and challenges for student teachers' learning of subject-specific pedagogical knowledge within secondary school subject departments', *The Curriculum Journal*, **18**, 4, 429–445.

Chowdry, H. and Sibieta, L. (2011). *Trends in Education and Schools Spending* (IFS Briefing Note BN121). Swindon: ESRC [online]. Available: http://www.ifs.org.uk/bns/bn121.pdf [12 March, 2013].

Day, C., Stobart, G., Sammons, P., Kington, A., Gu, Q., Smees, R. and Mujtaba, T. (2006). *Variations in Teachers' Work, Lives and Effectiveness* (DfES Research Report 743). London: DfES [online]. Available: http://dera.ioe.ac.uk/6405/1/rr743.pdf [27 February, 2013].

Gray, D. and Bryce, T. (2006). 'Socio-scientific issues in science education: implications for the professional development of teachers', *Cambridge Journal of Education*, **36**, 2, 171–192.

Hanley, P., Maringe, F. and Ratcliffe, M. (2008). 'Evaluation of professional development: deploying a process-focused model', *International Journal of Science Education*, **30**, 5, 711–725 [online]. Available: http://eprints.soton.ac.uk/50766/1/ijse_article_2-11-07_revisions.doc [27 February, 2013].

Hustler, D., McNamara, O., Jarvis, J., Londra, M. and Campbell, A. (2003). *Teachers' Perceptions of Continuing Professional Development* (DfES Research Report 429). London:

DfES [online]. Available: http://dera.ioe.ac.uk/4754/1/16385164-58c6-4f97-b85b-2186b83ede8c.pdf [27 February, 2013].

Jones, M., Harland, J., Mitchell, H., Springate, I. and Straw, S. (2008). *Evaluation of the Chemistry for Non-Specialists Training Programme: Final Report.* Slough: NFER [online]. Available: http://www.nfer.ac.uk/nfer/publications/ECN01/ECN01.pdf [27 February, 2013].

Joubert, M., Sutherland, R., Back, J., De Geest, E. and Hirst, C. (2008). 'How do teachers of mathematics understand 'effective' CPD?.' Paper presented at the Proceedings of the British Society for Research into Learning Mathematics Day Conference, Kings College, London, 15 November [online]. Available: http://www.bsrlm.org.uk/IPs/ip28-3/BSRLM-IP-28-3-Full.pdf [27 February, 2013].

Lowden, K., Hall, S., Lally, V. and Mancy, R. (2011). *SSREC's Support for Science Education in Scotland through CPD: External Evaluation Final Report.* Glasgow: University of Glasgow, School of Education [online]. Available: http://www.science3-18.org/images/Publications/SSERC%20SCRE_final.pdf [27 February, 2013].

Martin, M. (2006). 'Every day a training day', *Curriculum Briefing*, **4**, 2, 49–52.

McGregor, D. and Woodhouse, F. (2010). 'Continuing professional development for science teachers: what does research say?' *Education in Science*, **238**, 32–33 [online]. Available: http://eprints.hud.ac.uk/10199/1/WoodhouseContinuing.pdf [27 February, 2013].

Murphy, C., Neil, P. and Beggs, J. (2007). 'Primary science teacher confidence revisited: ten years on', *Educational Research*, **49**, 4, 415–430.

Office for Standards in Education (2006). *The Logical Chain: Continuing Professional Development in Effective Schools*. London: Ofsted [online]. Available: http://www.ofsted.gov.uk/sites/default/files/documents/surveys-and-good-practice/t/The%20logical%20chain%20continuing%20professional%20development%20in%20effective%20schools%20%28PDF%20format%29_0.pdf [27 February, 2013].

Robinson, M., Walker, M., Kinder, K. and Haines, B. (2008). *Research into the Role of CPD Leadership in Schools.* Slough: NFER [online]. Available: http://www.nfer.ac.uk/nfer/publications/PDL01/PDL01.pdf [27 February, 2013].

Science and Engineering Education Advisory Group (2012). *Supporting Scotland's STEM Education and Culture: Second Report.* Edinburgh: The Scottish Government [online]. Available: http://www.scotland.gov.uk/Resource/0038/00388616.pdf [27 February, 2013].

Varga-Atkins, T., Qualter, A. and O'Brien, M. (2009). 'School professionals' attitudes to professional development in a networked context: developing the model of 'believers, seekers and sceptics', *Professional Development in Education*, **35**, 3, 321–340.

Walker, M., Jeffes, J., Hart, R., Lord, P. and Kinder, K. (2011). *Making the Links Between Teachers' Professional Standards, Induction, Performance Management and Continuing Professional Development* (DfE Research Report 075). London: DfE [online]. Available: https://www.education.gov.uk/publications/eOrderingDownload/DFE-RR075.pdf [27 February, 2013].

Wellcome Trust (2006). *Believers, Seekers and Sceptics: What Teachers Think About Continuing Professional Development.* London: Wellcome Trust [online]. Available: http://www.wellcome.ac.uk/stellent/groups/corporatesite/@msh_peda/documents/web_document/wtx028430.pdf [27 February, 2013].

Appendices

Appendix 1 Levels of engagement with science-specific CPD

For the CPD leaders CATI survey the schools and FE colleges were selected so that the sample include schools and FE colleges with varying levels of engagement with science-specific CPD. This measure was based on the total number of days' involvement that a school or FE college had with the National and Regional Science Learning Centres between September 2007-2012 (this also included schools with no involvement). The schools and FE colleges were banded into six levels corresponding to the percentage of involvement (from the lowest 15% to the top 15%). Within each education phase the number of days corresponding to a level varied, for example in primary schools the least engaged level (lowest 15%) included schools undertaking 1- days whereas at the secondary level this included schools undertaking 0- days. Although the numbers of days in each level varied across educational phased, nevertheless the proportion of schools that this represented did not.

For the purpose of analysis the six levels were collapsed into three: low engagement (lowest third of schools), medium engagement (middle third) and high (top third of schools). These were the categories used when classifying the CPD leaders' interviews.

Appendix 2 Profile of Respondents

A2.1 CPD leaders' CATI Survey

The CATI survey respondents represented schools and FE colleges situated in a wide range of geographical locations in England. The proportion of schools and FE colleges from the various locations is shown in Figure A1, below.

Figure A1 Geographical location of the schools and FE colleges involved in the CPD Leaders' CATI survey
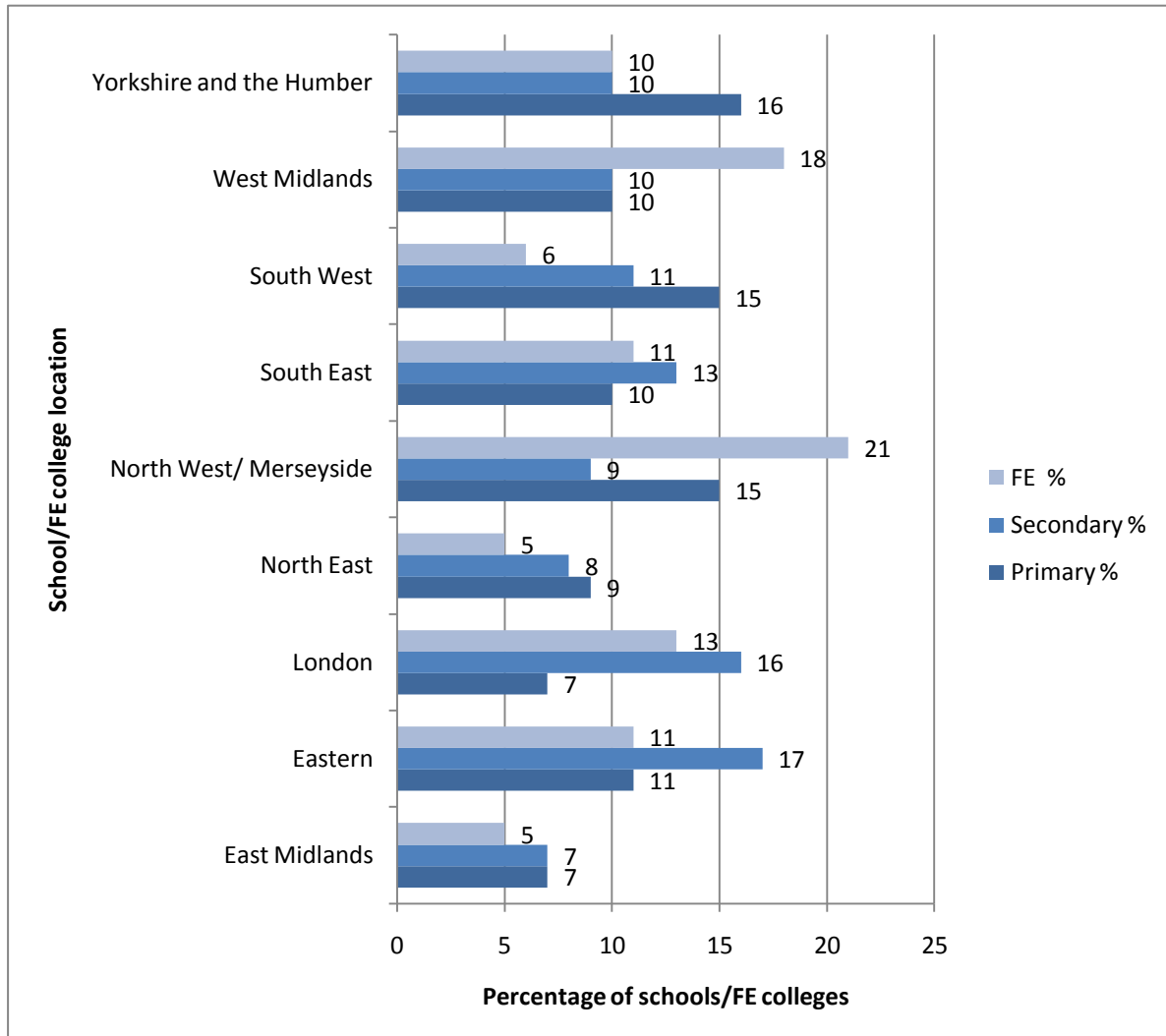
A total of 400 respondents.
Source: CPD Leaders CATI survey 2012

The respondents in the CPD Leaders' CATI survey held a variety of positions within their school or FE college. This range and the proportion of respondents in that role is shown in Figure A2, below

Figure A2 Roles of CPD leaders' CATI survey respondents
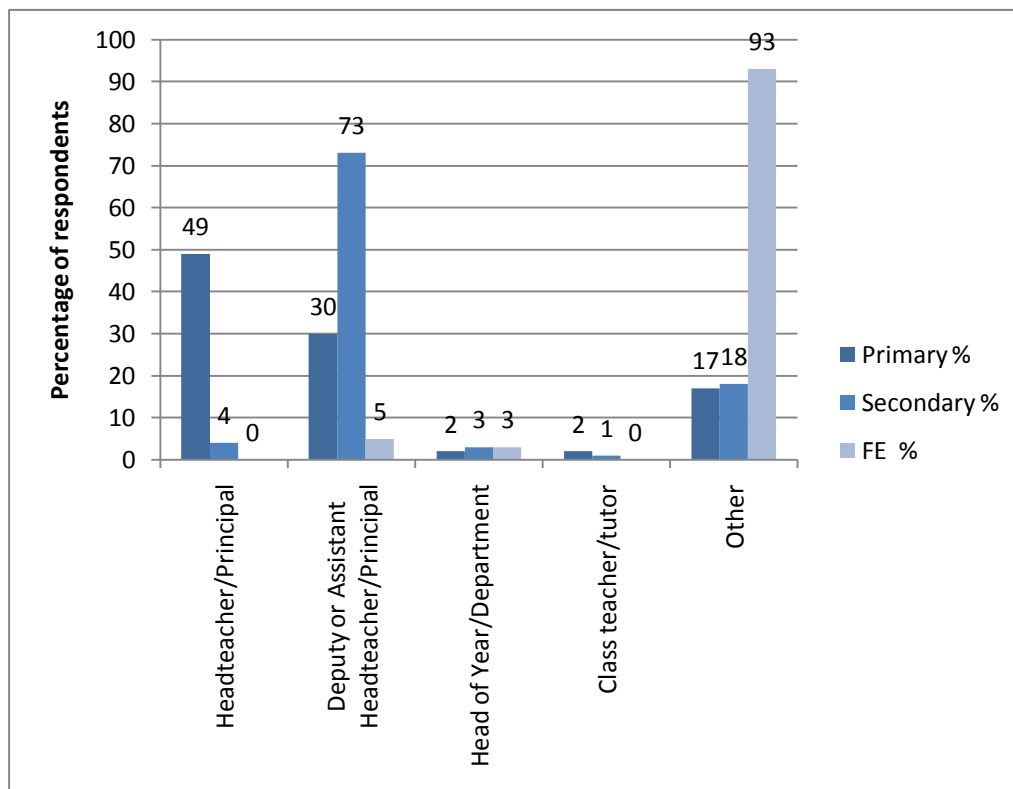
A total of 400 respondents.
Source: CPD Leaders CATI survey 2012 Q13

A2.2 Head of Science Focus Groups

Two focus groups were conducted with secondary school Heads of Science and aspiring Heads of Science in January 2013. The respondents were attending a course for aspiring and new heads of science residential course at the National Science Learning Centre. There were 10 participants in the first and 7 participants in the second focus group. The participants were a mixture of deputy heads of science, and in a few cases heads of subject (e.g. head of biology), who were wishing to become heads of science in the future and current heads of science. All the respondents said that they, and in most cases members of their department, frequently undertook science-specific CPD. The schools which the respondents taught in were very diverse in terms of their geographical location, pupil intake and attainment, and included schools in challenging circumstance.

A2.3 CPD Leader interviews

Interviews were conducted with 19 CPD leaders, who held various roles within the schools and FE colleges, as shown in Table A1. The schools and FE colleges which the CPD leader participants came from were also classified by their level of involvement with the National

and Regional Science Learning Centres and the interview participants came from schools and FE colleges covering a range of levels of engagement as is shown in Table A2 below

Table A1 The role of the participants in the CPD Leaders' interviews

Participant role	Phase of Education		
	Primary	Secondary	FE
Headteacher/principal	4	0	0
Deputy Headteacher/Assistant Head	2	4	0
Other	2	2	5

A total of 19 respondents.
Source: CPD Leaders interviews 2013

Table A2 The distribution of the CPD leaders' schools and FE colleges by the level of engagement with the National and Regional Science learning Centres.

	Level of engagement with National and Regional Science Learning Centres Number of schools		
	Low engagement	Medium Engagement	High Engagement
Primary	2	4	2
Secondary	4	2	
Tertiary	1	2	2

A total of 19 respondents.
Source: CPD Leaders interviews 2013

Appendix 3 CPD leaders' CATI survey instrument

<u>Investigation of Headteachers' and teachers' views towards science-specific CPD</u>

<u>CPD leader CATI survey</u>

Introduction

Good morning/afternoon/evening. I am calling on behalf of the National Science Learning Centre to ask you about your views on science-specific CPD.

My name is <   >, I am calling from QA Research, the independent social and market research company. We are undertaking this research in partnership with the National Foundation for Educational Research. The purpose of the research is to better understand the attitudes of CPD leaders and what affects their decision-making process in relation to participation in subject-specific CPD.

As the person with responsibility for CPD in your school/college, I would like to ask you to take part in a brief telephone interview for the research.

We would encourage you to take part in this interview which will provide you with an opportunity to reflect on your views and practices with regard to promoting and signing-off different forms of CPD. The interview should only take about <10> minutes to complete and your answers will be treated confidentially.

Your responses may be linked to NFER's Register of Schools database. This linking is solely for statistical purposes – anonymity will be guaranteed. Is it convenient to interview you now? Thank you very much for taking the time to participate in this research.

<u>The values and priorities CPD leaders place on different areas of CPD</u>

We would like to start by asking you about the value and priority that your school/college places on CPD.

1.   How frequently does your school/college engage in the following areas of CPD? (Tick one box for each option)
     Scale – Never, infrequently, frequently

     - General aspects of teaching and learning across all staff and curriculum areas
     - Teaching and learning in specific curriculum subjects or occupational areas
     - Behaviour management

- Development of teachers/tutors as curriculum/senior leaders.

We understand that these areas will all have some value, but we are interested in your school's/college's view on their relative merits.

1. Thinking about your school's/college's priorities for CPD, which of these areas would you currently regard as the most important? (Tick one)

    - General aspects of teaching and learning across all staff and curriculum areas
    - Teaching and learning in specific curriculum subjects or occupational areas
    - Behaviour management
    - Development of teachers/tutors as curriculum/senior leaders.

1. Which of these areas would you currently regard as the least important? (Tick one)

    - General aspects of teaching and learning across all staff and curriculum areas
    - Teaching and learning in specific curriculum subjects or occupational areas
    - Behaviour management
    - Development of teachers/tutors as curriculum/senior leaders

    a) Are there times when you would prioritise CPD in one curriculum area over another?
    Yes/No

    b) If yes, please specify the curriculum areas that are prioritised

    c) If yes, what is the usual reason for prioritising one curriculum area over another?

     (Do not read out, match to nearest response option(s) or create new one)

    - Responding to government initiative(s)/policy
    - View some subjects as being more important than others
    - Responding to weaknesses identified through examination or test results
    - Weak teaching
    - Cohort-specific pupil issues
    - Responding to Ofsted inspection findings/recommendations

    Thinking about CPD in general, how frequently would the following members of staff be involved in deciding what type of CPD was appropriate?

Scale - Never, Sometimes, Always

- Individual
- Line Manager
- Headteacher/Principal
- Deputy/Assistant Headteacher/Principal
- Subject leader/coordinator
- CPD leader
- Other (please specify)

Evaluating CPD

1. a) Does your school/college evaluate the impact of CPD? (Read out – single code)
   Scale - Never, Sometimes, Always

   If the school/college does not evaluate CPD (i.e. they answer 'Never'), go to question 7.

   b) Which processes are used to evaluate the impact of CPD? (Read out and tick all that apply)
   - As part of the performance management process for teachers/tutors
   - As part of the performance review/appraisal process for support staff, including science technicians
   - Through departmental or curriculum meetings
   - Through informal discussions/meetings
   - Through pupil/student views on staff practice.
   -
   - c) How is CPD usually evaluated? (Read out and tick all that apply)
   - In terms of impact on the knowledge and skills of staff
   - In terms of impact on staff practice
   - In terms of impact on pupils/students
   - In terms of staff job satisfaction
   - Other (please specify)

Views on and experiences of undertaking science-specific CPD

We are also interested in your views of science-specific CPD.

1. a) Have any of your staff undertaken science-specific CPD in the last 12 months?
   Yes (Go to 6b)/No (Go to 6c)

b) If yes, which of the following best describes the reasons for undertaking this CPD (Please tick all that apply)

- To improve your staff's science knowledge
- To refresh your staff's science knowledge
- To improve your staff's science teaching methods and skills
- To enable networking with science subject professionals
- To access science specific resources/materials
- To make lessons more fun and engaging for learners
- To build staff confidence in teaching science
- Other (please specify)

c) If no, to the best of your knowledge, have any of your staff *ever* undertaken any science-specific CPD?
Yes (Go to Q7)/No (Go to Q10)

2. Who would be most likely to request undertaking science-specific CPD, either for themselves or for another member of staff? (Please tick all that apply)
3.
- Science subject leader/science coordinator
- Science technician
- Class teacher/tutor
- Line manager
- CPD leader
- Senior manager (e.g. headteacher/principal, deputy headteacher).
- Other (please specify)
-
- Not applicable (no-one has ever requested undertaking science-specific CPD)

4. Based on your experience, to what extent do you agree that science-specific CPD has made a positive impact in the following areas?
Scale – Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree, Don't know, No experience of this type of impact

- on science teaching and learning
- across the whole school/college (for example by influencing practice and sharing learning).

<u>Previous and anticipated future spending on science-specific CPD</u>

We would now like to ask you about your school's/college's previous and anticipated future spending on science-specific CPD

5. How would you describe your school's/college's pattern of spending on science-specific CPD over the last 3 years? (Pick one)

   - It has been rising
   - It has been falling
   - It has stayed the same
   - It has varied every year
   - Don't know

6. What pattern of spending on science-specific CPD do you expect to see over the next 12 months? (Pick one)

   - It will rise
   - It will fall
   - It will stay the same
   - Don't know

7. Finally, is there anything else you would like to say about your views on the value of science-specific CPD?

Questions about you
8. What is your job title? (Single code - select most senior role if respondent has more than one)

   - Headteacher/Principal
   - Deputy or Assistant Headteacher/Principal
   - Head of Year/Subject leader
   - Class teacher/tutor

9. How long have you been a teacher/tutor?

10. How long have you had responsibility for CPD within your school/college?

11. We would like to follow-up this strand of the research with an interview to explore in greater detail CPD leaders' views on science-specific CPD. Would you be willing to be approached sometime before the end of February 2013 for a follow-up interview?
Yes/No

If yes, please provide your name and contact number:
Mr/Ms/Mrs/Miss/Dr: _____
Daytime contact number: _____
Email address: _____

Providing independent evidence to improve education and learning.