

The cost of high-quality professional development for teachers in England

Jens Van den Brande
and James Zucollo

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Research Area:
Teaching and Leadership:
Supply and Quality



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Summary

The cost to the government of Wellcome's proposed CPD entitlement

- We find that the nominal total cost to the government of Wellcome's proposed policy entitling all teachers to 35 hours annually of high-quality continuing professional development would be £210 million each year.
- This cost to the government is less than 1 per cent of total school expenditure, indicating that the current level of spending on CPD may be nearly sufficient to fund an annual 35-hour entitlement.
- The cost per pupil may be higher for small schools with fewer pupils to spread costs over.
- If this policy were to be implemented, policy makers should focus their attention not only on increasing CPD spending to fund the entitlement but also on the improving the quality of CPD provided.

Schools' current spending on CPD

- We find an average spend on CPD per teacher of £2,950 across all schools.
- Most schools (around 80 per cent) spend less than 3 per cent of their budget on CPD each year.
- The difference between the required spending to support the CPD entitlement and current spending on CPD is £494 per teacher on average, which would be a 17 per cent increase in CPD spending. As a proportion of total school expenditure, it would be an increase of less than 1 per cent.
- The present level of spending on CPD means that 83 per cent of schools would need to increase their expenditure to cover the cost of the entitlement.

Background

The Education Policy Institute (EPI) have been commissioned by Wellcome to derive an estimate for the cost to the government of a policy entitling all teachers to 35 hours of high-quality continuing professional development (CPD) every year. The aim of the proposed policy is to improve both the quantity and quality of professional development undertaken by teachers in England. There is presently no entitlement to high-quality CPD for teachers in England.

This report is part of a wider portfolio of research on high-quality CPD that EPI has embarked upon on behalf of Wellcome. EPI previously undertook a comprehensive literature review to determine the impact of high-quality professional development on pupil learning. We published the findings in February 2020.¹ The review found that high-quality CPD for teachers has an average effect size equivalent to one month of extra learning for pupils.

To supplement this review, EPI undertook a cost benefit analysis (CBA) to value the impact of providing more high-quality professional development for teachers and estimate whether the benefits of introducing this policy exceed the likely costs. We published the findings of this cost-benefit analysis in April 2021.² The report found that high-quality CPD for teachers has an estimated benefit an order of magnitude greater than the estimated cost, which indicates we can be confident that a well-implemented policy would have social benefits.

This study builds on the CBA by estimating the cost to the government if this policy were to be implemented at a national scale. We also estimate how well schools with different pupil intakes would be able to absorb the cost of this policy proposal, that is would the policy disproportionately affect the budgets of specific groups of schools.

¹ Fletcher-Wood and Zuccollo, 'The Effects of High-Quality Professional Development on Teachers and Students: A Rapid Review and Meta-Analysis'.

² Van den Brande and Zuccollo, 'The Effects of High-Quality Professional Development on Teachers and Students'.

Approach

To estimate of the cost of this policy to the government and understand the additional school funding that might be required to support its implementation, there are four steps:

- Estimate the cost to schools of teachers taking up the CPD entitlement.
- Estimate schools' current spending on CPD.
- Calculate the additional cost that the government would need to fund.

At each stage there are significant uncertainties in the estimates. We have attempted to outline the most important of these below and provided several scenarios to test the impact of the uncertainty on the final cost.

The cost to schools of teachers taking up the entitlement

We considered the cost of delivering high-quality CPD in the CBA and found a range of existing estimates. A core problem is that effective programmes vary dramatically in their duration, which makes it difficult to estimate the cost-per-hour of high-quality CPD. There are also several categories of cost, not all of which are well estimated in many sources. For example, we would ideally account for the:

- Costs for providing the CPD.
- Costs for travel and subsistence if the CPD is externally provided.
- Costs for staff cover as teachers will not be able to teach lessons when they are undertaking their CPD.
- Cost of time spent preparing CPD, if delivered by school staff.

Very few sources include all costs. We reviewed data from the EEF CPD trials, Wellcome's CPD Challenge, and the DfE to arrive at a central estimate of £54 per pupil per year. That figure is drawn from the Education Endowment Foundation's (EEF) study on Dialogic Teaching and uplifted to current prices.³ The per-pupil figure includes all cost categories apart from staff cover costs and the cost of preparation time (we do however account for staff cover costs in our estimate of the cost of the entitlement, details of which can be found in the annex). That intervention also aligns well with the intention of the policy proposal and is similar to the estimates from other sources. A fuller discussion of this data is in our published CBA report.

This figure is multiplied by the number of pupils in each school to give the minimum amount that schools should be spending to be able to supply their teachers with 35 hours of high-quality CPD a year. This provides an estimate of the average cost separately for each school, which is helpful as not only might the cost of delivering CPD vary across groups of schools, but staff costs as a proportion of their total budget will also vary.

It is possible that not all teachers would take advantage of the entitlement and, in our CBA, we assumed that they would undertake about nine extra hours of high-quality CPD. That is based on numbers from CFE Research's evaluation of the CPD Challenge.⁴ However, it would be important for

³ Jay et al., 'Dialogic Teaching'.

⁴ Leonardi et al., 'Progress towards the Wellcome CPD Challenge':

the government to be able to fund the full entitlement they promise to teachers so, in this estimate, we assume full uptake.

Schools' current spending on CPD

We will use school finance data to examine the budget that schools commit to CPD. Schools spend different proportions of their budgets on CPD and some may already be spending enough to fund the full entitlement of high-quality CPD.⁵ CFE Research's evaluation of the CPD Challenge already suggests that schools may not have increased their spending on CPD during the Challenge but, instead, redirected it.

Unfortunately, there is also considerable uncertainty about how much schools presently spend on CPD. We discuss this in more detail below.

Some schools carry in-year balance surpluses, while others have in-year deficits. Where there is a surplus, some of it may be available to support additional expenditure on a CPD entitlement without further government support. However, we have chosen not to account for these balances in our calculations as it only relates to in-year balances and does not give a robust estimate of the financial health of schools. The additional expenditures incurred through the pandemic may also mean that schools' finances are squeezed over the next few years so the situation for schools may look different compared to the 2018/19 data we currently have available. There is also no precedent for additional government funding to be distributed based on the previous year's in-year balances.

The cost to the government of the entitlement

To estimate the additional cost, we take the amount that schools are currently spending on CPD and subtract it from the estimated total cost of the entitlement. This would be the current shortfall without accounting for any budget that schools have available to support the entitlement. This is our main scenario and the true cost to the government to fund the entitlement.

This calculation makes several important simplifications:

- We assume that the quantity and quality of the spending is not limited by the capacity of training providers to deliver it, which we would not be able to consider without a more detailed survey of training providers. If that is not the case, then it is possible that the quality of CPD may suffer.
- We assume that each school is funded according to its individual needs, which is not how funding tends to be distributed to state-funded schools. The next section outlines how we deal with this.

The earlier CBA report did not subtract off current spending because it sought to estimate the total cost of the policy to society, not the additional cost to the government. That accounts for the difference in cost figures between the figures below and those included in that report.

⁵ Weston, 'A Postcode Lottery for Teachers'.

The distributional impact of the entitlement

The circumstances of individual schools vary dramatically, which will affect the affordability of the CPD entitlement. For example, small schools have fewer pupils and teachers over which to spread the costs of CPD.

To calculate the overall additional cost, we have examined the circumstances and spending of individual schools in the latest data; however, any plausible mechanism for distributing the funding would need to operate at a higher level of abstraction. For example, the DfE could choose to provide any additional funding at a constant per-pupil rate, it could set a floor or ceiling on the amount received, or it could adjust the rate by school phase, type, or pupil characteristics.

Designing a mechanism is beyond the scope of this report but, to illustrate the issues we conduct a brief distributional analysis of the current CPD spending per pupil across various school characteristics. In our model, the cost of CPD per pupil is fixed so the additional cost of the entitlement to the school, or government, depends primarily on the current level of expenditure. We examine whether that systematically varies by:

- School type.
- School phase.
- School size.
- Proportion of pupils eligible for free school meals.
- Proportion of pupils with special educational needs

If it does, then school budgets in some groups could be more heavily affected by an entitlement. That does not necessarily mean that they should receive more government funding, but it will highlight which school groups could benefit from greater financial support to fund the proposed policy.

Current spending on professional development

To estimate the current level of spending on professional development we use schools' financial data. The Department for Education (DfE) publishes comprehensive expenditure figures for all schools and those figures include a category for professional development. We use the 2018/19 figures, which were the latest at the time of analysis. However, we uplift all figures to current prices.

There are two sets of financial data published by the DfE:

- detailed school income and expenditure data for around 14,000 local authority maintained, mainstream schools through the Consistent Financial Reporting (CFR) returns.
- detailed school income and expenditure data for around 9,000 mainstream academies through the Academies Accounts Returns (AAR).⁶

The DfE publishes this data on the income, expenditure annually for nursery schools, primary schools, secondary schools, special schools, and pupil referral units in England. We use data from the AAR and CFR to estimate schools' current expenditure on staff development and training in England, which we refer to as CPD spending.

When analysing this data we have made the following assumptions:

- We restrict the data to only examine primary and secondary schools because the different needs and pupil-teacher ratios of many other settings make it difficult to generalise across them.
- We have not harmonised the different reporting periods for the AAR and CFR, as both datasets cover an entire school year, and we are not seeking to draw conclusions about a particular year's expenditure.
- We use the latest, single year of AAR and CFR (which is the 2018/19 academic year) but have verified that the conclusions hold for other recent years.
- For academies that are part of a multi-academy trust in the AAR data, we have distributed the trust-level spending by the number of pupils in the school.

Limitations of the data

Using this data to estimate how much schools spent on CPD is not straightforward. There are several reasons why it is unlikely to comprehensively account for the total spending on CPD:

- Expenditure on CPD does not always neatly fit into the spending on staff development and training, it can fall under other expenditure categories (eg online training that is classed as software expenditure). The raw data excludes any direct CPD spending that is categorised as something other than CPD. It is impossible to determine from the DfE data how much expenditure is not included within the staff development and training figure, but informal discussions suggest it could be a substantial proportion.
- Spending on staff development and training excludes the cost of staff time for attending training. We included this in our CBA report by using staff costs at a school to estimate the cost of cover.

⁶ 'Data Sources and Interpretation'.

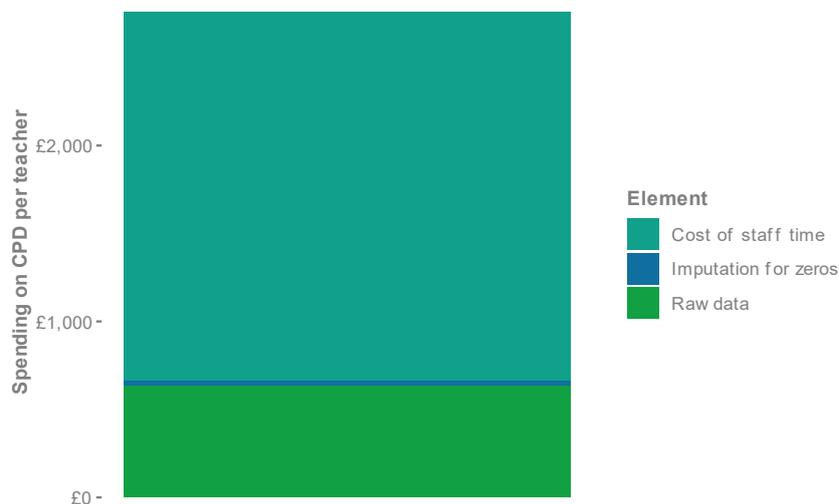
- Professional development designed and delivered by internal school or trust staff will not be included. That cost will be implicitly included in staff costs, but it is impossible to know how many hours staff spend delivering CPD to their colleagues.
- There are a significant minority (around 15 per cent) of academies that report spending nothing on staff development and training despite all schools having mandatory INSET days where CPD is typically undertaken. Only 2 per cent of LA maintained schools report no spending on CPD.

We can address two of these limitations:

- For the schools reporting no CPD spending we can impute the spending using school and pupil characteristics. We assume the data is zero conditionally at random and that we can observe the relevant characteristics of the schools, then use a CART model to impute the spending figures. Details of the process are in appendix A.
- For the time staff spend attending the training we can use estimates of the number of hours spent in CPD, along with staff costs, to estimate the cost of staff time. TALIS 2018 data indicates that teachers in England spend approximately 55 hours per year in CPD of their 1,265 hours of directed time (though the CPD Challenge indicates much of that is unlikely to meet all the government’s quality standards).

Supplementing the CPD data with these figures substantially increases the estimated spending on CPD. In the raw data, schools spend an average of £685 per teacher on CPD, which is just under 1 per cent of total spending. After the two adjustments, we estimate average spending per teacher of £2,950, which is just under 3 per cent of total spending. Figure 1 shows that the largest contribution to the total cost is staff time, accounting for 78 per cent of the estimated total.

Figure 1: Elements of the average spending on CPD per teacher



Despite this estimate being far greater than the staff development cost reported in the raw data, it is still likely to be an underestimate of the full cost of CPD because it does not account for either the cost of staff preparing and delivering CPD internally, nor any CPD costs categorised elsewhere (eg software).

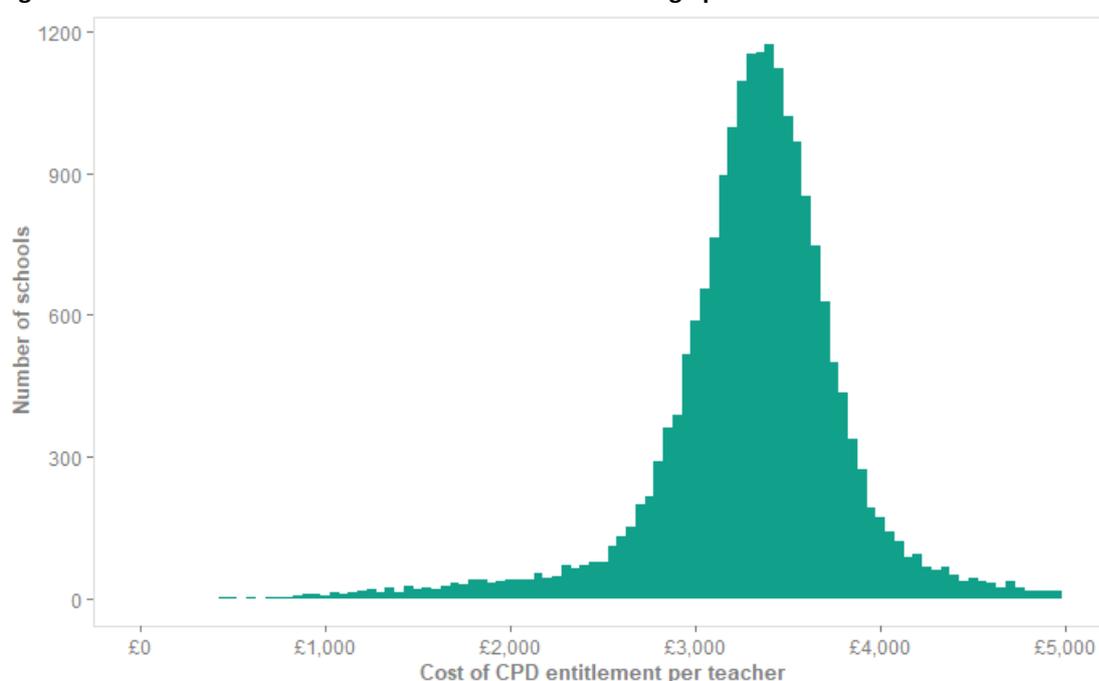
Cost of the entitlement

The cost to schools of teachers taking up the entitlement

The average cost of implementing the CPD entitlement is around £68,300 per school, which equates to £3,337 per teacher (Figure 2). For most schools, the cost would be less than £4,000 a year per teacher to deliver the CPD entitlement for all their teachers. The average per pupil cost of this entitlement would be £174 per pupil. The annual cost for all teachers in all schools is around £1.4 billion, which is just over 3 per cent of school expenditure.

Figure 2 shows the distribution across schools. It counts how many schools face each level of cost per-teacher, in bands of £50, if their staff take up the entitlement. For example, it shows that the most common cost per teacher is between £3,450 and £3,500, with almost 1,200 schools facing that level of potential expenditure.

Figure 2: Distribution of the cost to schools of teachers taking up the CPD entitlement



Schools' current spending on CPD

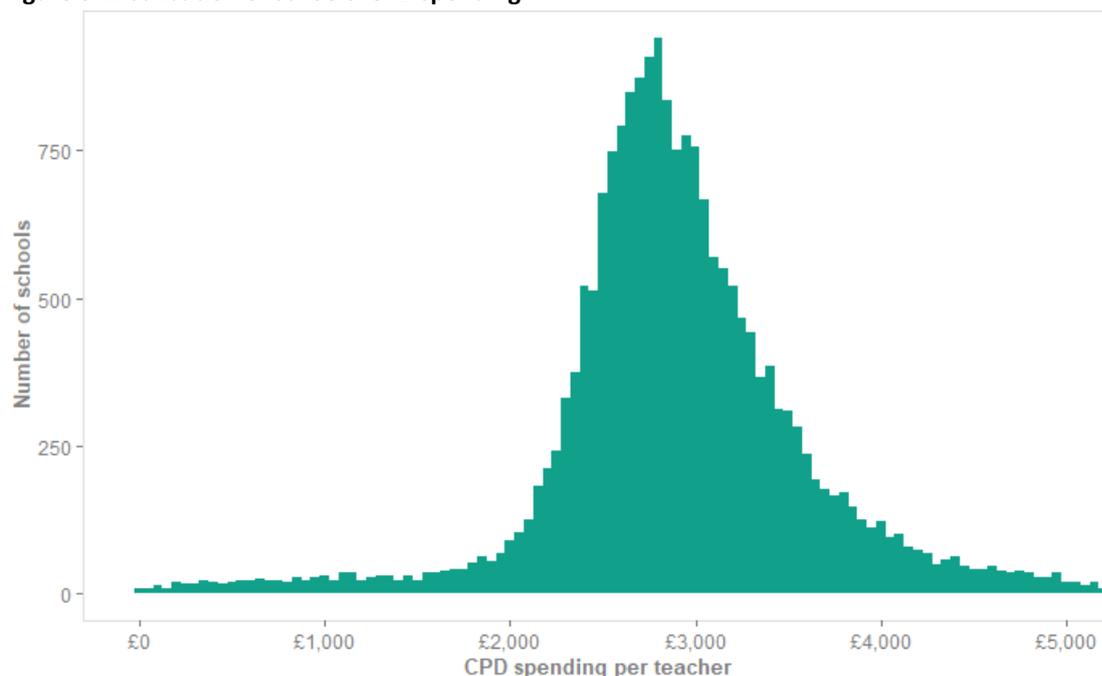
Figure 3 presents the distribution of schools' existing CPD spending per teacher. We find an average spend on CPD per teacher of £2,950 across all schools. Most schools (87 per cent) spend between £2,000 and £4,000 per teacher on CPD and very few spend less than £2,000 (5 per cent) or more than £4,000 per teacher (7 per cent).

Though there are proportionally few schools spending less than £2,000 per teacher, the 'tail' of the distribution that accounts for around 1100 schools is long and extends to £0 per teacher. Throughout our results, this long tail shows up as a group of schools for which the entitlement would be extremely expensive. However, that may not be the correct interpretation of the figures. Recall that we have been unable to include several categories of expenditure on CPD – software, for example – so it may be that these schools simply make greater use of online CPD, or categorise their

CPD expenditure slightly differently than most schools. There will undoubtedly be some schools that have to markedly increase their spending to provide the entitlement to their staff, but it is not clear that is the case for all schools in the tail.

A second consequence of the long tail is that the average figures (means) we report in the text are often some way from the most common figure (the mode) or the figure in the middle of the distribution (the median). We have provided the distribution of costs in most cases so that readers can see for themselves the full range of the impact on schools and the figures in the text should be interpreted in that context.

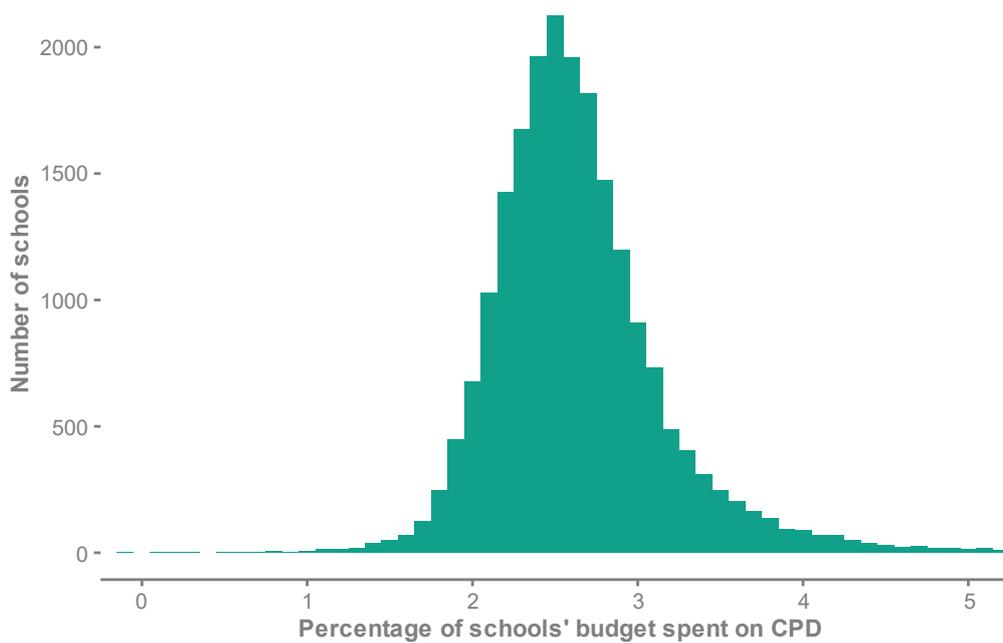
Figure 3: Distribution of schools' CPD spending



Converting those raw expenditures to a percentage of total school spending shows that most schools (around 80 per cent) spend less than 3 per cent of their budgets on CPD each year (Figure 4). Recall that this includes both the direct spending on CPD, plus an estimate of the cost of staff time spent attending the CPD. It still does not include the cost of staff time constructing and delivering CPD, nor the cost of software and other materials or tools that may be used to deliver it. Nonetheless, including the cost of staff time generates a spending figure that is well above the direct cost of 0.55 per cent of spending that is often cited.⁷

⁷ eg Hannay, 'Personnel Development'; Weston, 'Further Falls in CPD Spending'.

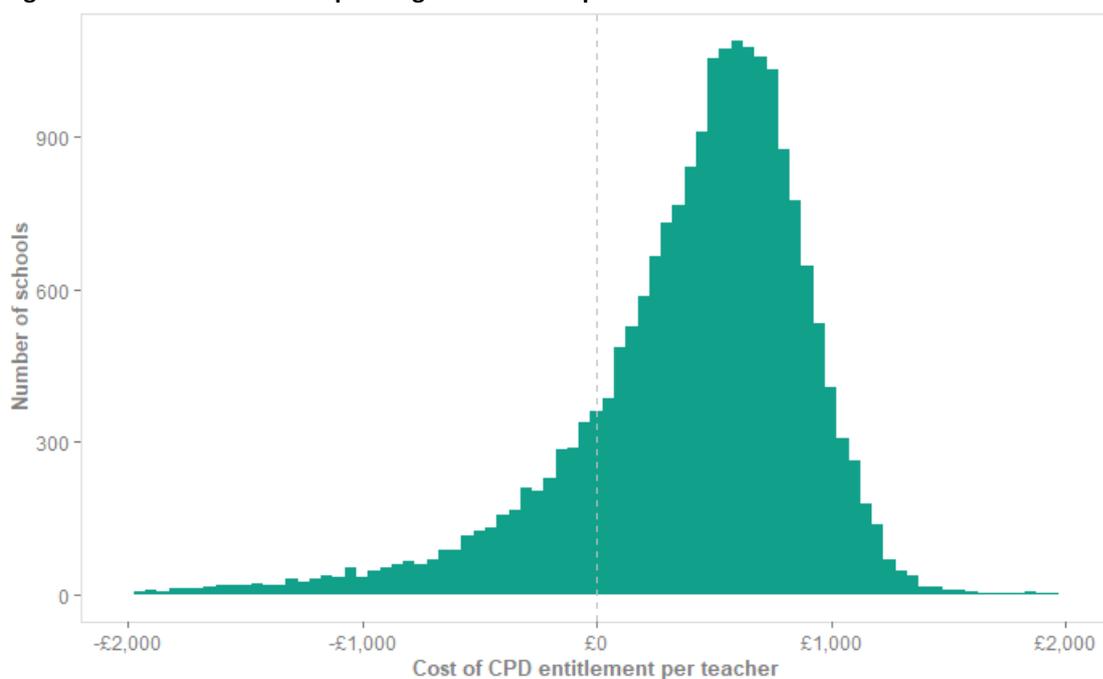
Figure 4: Distribution of schools' CPD spending as a percentage of their budgets



The cost to the government of the entitlement

The average difference between the required spending to support the CPD entitlement and current spending on CPD is £494 per teacher (Figure 5), which is an increase over current CPD spending of 17 per cent. The present level of spending on CPD means that 83 per cent of schools would need to increase their expenditure to cover the cost of the entitlement. The nominal total cost to the government would be around £210 million in this instance.

Figure 5: Current shortfall in spending relative to requirements



If schools were to be fully funded for the additional cost, assuming they did not cover it from any available surplus, it would require an extra £26 per pupil, on average. That is an increase in total school funding of less than 1 per cent. This highlights that, after considering the amount of time that teachers spend on CPD and hence the cost of teaching staff time that is associated with that, schools are already almost spending what is required to implement a high-quality 35-hour CPD entitlement.

Therefore, the issue is that the quality of the CPD that is currently being administered is not sufficiently high, therefore policy makers should be focusing their attention on CPD implementation as well as on increasing CPD spending to fund the entitlement. This corroborates findings from the Wellcome CPD Challenge that, after only a year of the Challenge, schools could increase the number of high-quality CPD hours without any additional cost.

That is not to say that some schools with low expenditure on CPD would not struggle to fund the entitlement. As with any policy, a flat funding rate would benefit some schools that already spend more than average on CPD, and disadvantage those that spend less. We explore these differences in the next section; however, the precise distributional impact will depend on the exact specification of the funding policy.

It is important to emphasise that, while the entitlement could perhaps be implemented at a lower cost, reducing funding would likely jeopardise the quality of the programme and reduce the impact on children's learning.

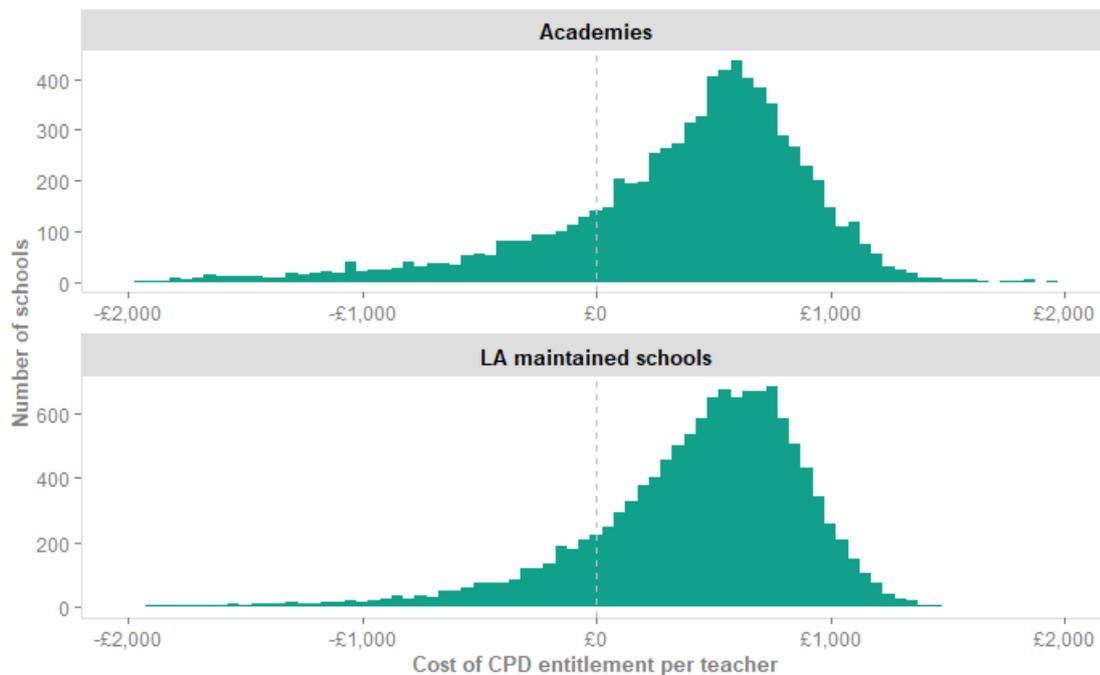
Distributional impact

The key factor that influences the impact this proposed policy will have on a particular school versus another is the schools' current spending on CPD. Therefore, in this section we assess how these elements vary by school and pupil characteristics to ascertain this policy's distributional impact.

School type

The distribution of academies and local authority (LA) maintained schools' spending on CPD are very similar with most schools of both types spending between £2,000 and £4,000 per teacher on CPD. The average spending on CPD per teacher is slightly higher for academies relative to LA maintained schools, with academies spending £3,036 compared to £2,856 for LA maintained schools. This implies that, on average, academies would need to increase expenditure by only £455 per teacher to cover the cost of the entitlement, while LA maintained schools would need to find an additional £537 per teacher (Figure 6).

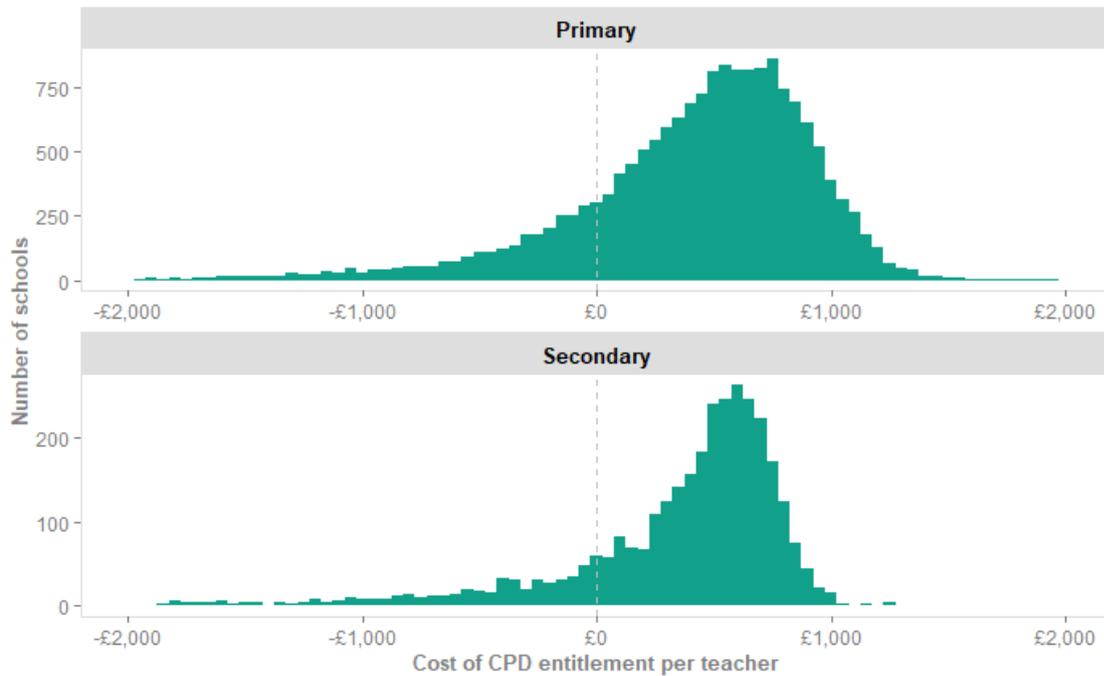
Figure 6: Shortfall in current spending, by school type



School phase

The average spending on CPD per teacher is slightly higher for secondaries (£3,016) relative to primaries (£2,893). This implies that, on average, secondary schools would need to increase expenditure by only £456 per teacher to cover the cost of the entitlement, while primary schools would need to find an additional £526 per teacher (Figure 7).

Figure 7: Shortfall in current spending, by school phase

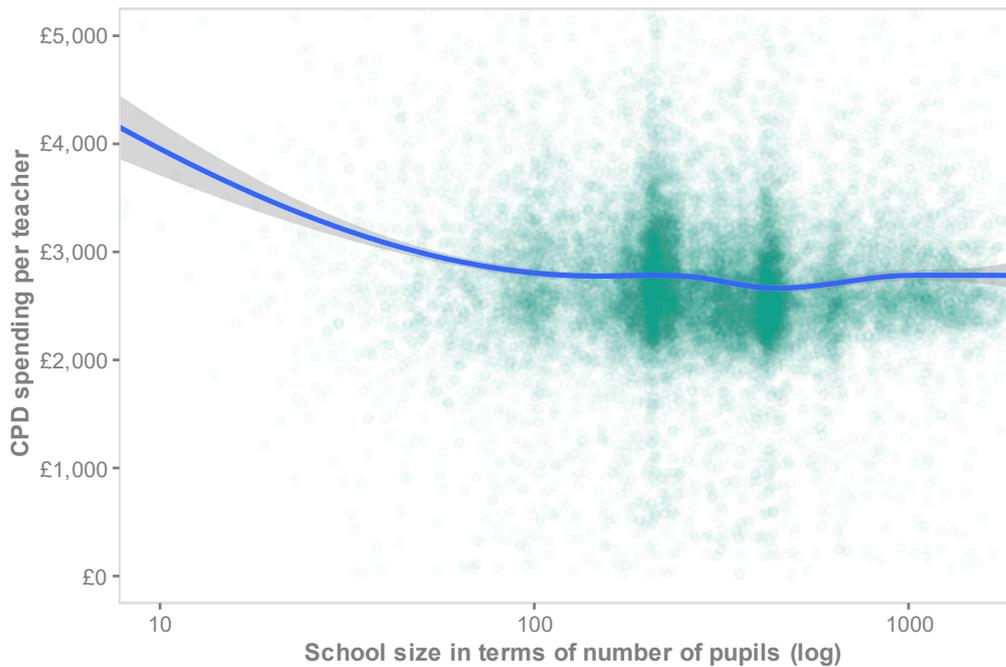


School size

For schools with fewer than 100 pupils there is a slightly negative association between schools' CPD expenditure and their size, with these schools tending to spend more per teacher on CPD (Figure 8). Beyond that, there is no clear association between spending and school size.

It is typical for small schools to spend more per pupil, and per teacher, because they struggle to gain the scale necessary to reduce the per-unit expenditure. The same appears to be true for CPD, so these schools may also find that their cost per pupil to deliver the entitlement is greater than we have estimated in this report. A constant funding increase per pupil is unlikely to be sufficient to cover the additional cost of the entitlement for these small schools.

Figure 8: Relationship between schools' current CPD spending and school size



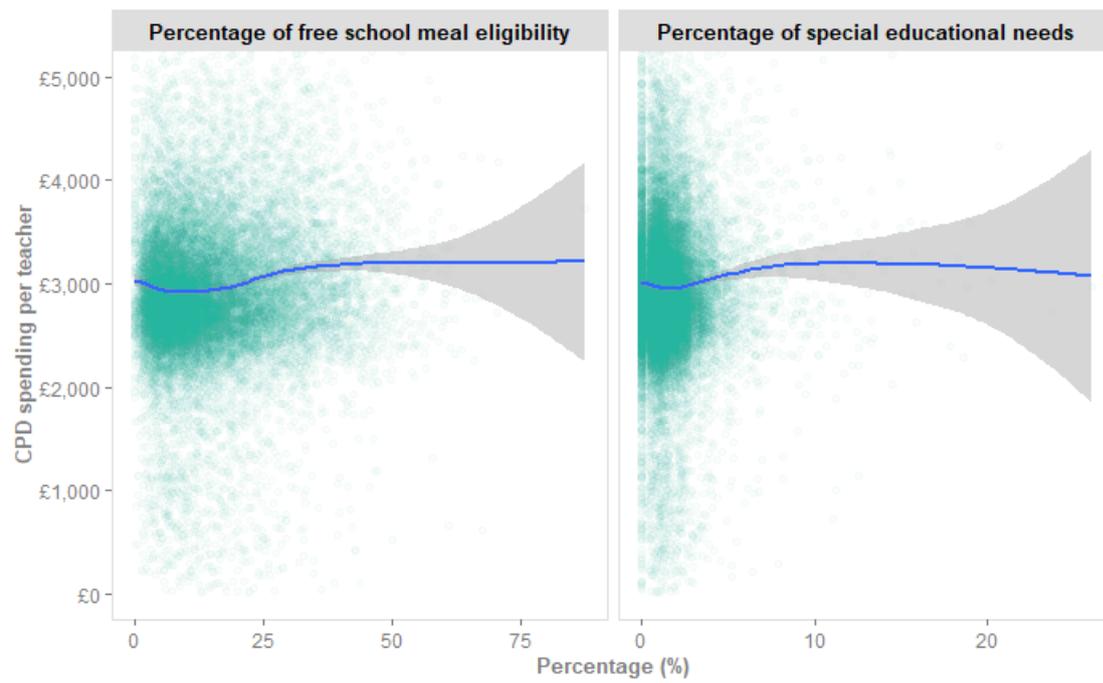
Note: Each point in the scatter is a school. Line fitted with loess estimator; grey shading denotes 95 per cent confidence interval of estimator.

Pupil characteristics

Finally, we compare schools' ability to absorb the additional cost by the level of disadvantage of their pupil intake. We use two measures of pupil disadvantage: the proportion of students eligible for free school meals (FSM), and the proportion of students with special educational needs (SEN).

There is no clear association between schools' expenditure on CPD and either the proportion of pupils eligible for free school meals or with special educational needs (Figure 9). That means schools with more disadvantaged intakes would not find it more expensive to fund a CPD entitlement, on average, than schools with less disadvantaged intakes.

Figure 9: Relationship between school' current CPD spending and pupil characteristics



Note: Each point in the scatter is a school. Line fitted with loess estimator; grey shading denotes 95 per cent confidence interval of estimator.

Conclusion

In this report we have derived an estimate for the cost to the government of a policy entitling all teachers to 35 hours of high-quality CPD every year. There is presently no entitlement to high-quality CPD for teachers in England. We find that the nominal total cost to the government of a policy entitling all teachers to 35 hours of high-quality continuing professional development would be £210 million if the government funded the entirety of the additional cost. This cost to the government is less than 1 per cent of total school expenditure, indicating that the level of current spending in schools on CPD is not substantially lower than the expenditure required to fund the 35-hour entitlement. Therefore, if this policy were to be implemented, policy makers should focus their attention not only on increasing CPD spending to fund the entitlement but also on the improving the quality of CPD teachers participate in.

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Appendix: Supplementing the spending data

We supplement the data on staff development and training spending in two key ways:

- we treated every school that reports zero spending on staff development and training, as a missing value and imputed the spending figure to give a more plausible value of spending on CPD. Imputation is implemented using the package ‘mice’ in R.⁸ It involves imputation for multivariate missing data using CART, where each incomplete variable is imputed using a separate model. We assumed that the staff development and training figures for these schools were missing at random, conditional on the following variables: staff development and training, number of teachers, number of pupils, percentage of pupils claiming free school meals, percentage of pupils with special educational needs, percentage of pupils with English as an additional language, total school expenditure, phase of the school and the source dataset.
- the cost of staff time will also be added to the staff development and training figures for all schools. We can only attribute the average number of CPD hours in England to schools by primary, but we can use each school’s staff costs to separately estimate the cost of those hours for an individual school. It will not account for any time staff spend preparing to deliver CPD, but it will account for the time they spend in the training, whether in the school or outside it. Effectively, we look at the annual expenditure for each school on teaching staff and divide this figure by the annual number of directed hours for teachers (ie when teachers are directed by their head teacher to be at work and available for work). We assume that teachers have 1,265 hours of directed time a year. This effectively results in a staff cost per hour for each school, which we then multiply by the number of hours that teachers currently spend on CPD a year. We use the average number of hours spent a year on professional development for primary teachers, which were calculated in the CBA. We then add this cost of staff teaching time to the direct spending on CPD.

Despite these adjustments of significant under-reporting and staff time, it is likely that we have not managed to fully account for either, hence this estimate is still probably an under-estimate of the true spending on CPD.

⁸ van Buuren and Groothuis-Oudshoorn, ‘Mice: Multivariate Imputation by Chained Equations in R’; R Core Team, *R: A Language and Environment for Statistical Computing*.