

A professional challenge for science educators

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• Nan Davies • Emily Perry • John Holman

Continuing professional development (CPD) is key to improvement in pupil and teacher outcomes, yet teachers in England are not yet entitled to participate in it. Wellcome's CPD programme aims to ensure that all teachers have access to high quality, predominantly subject-focused CPD annually, all of which is aligned to their own professional development needs. As part of this programme, Wellcome has funded a pilot study to understand how schools would implement a CPD entitlement for teachers alongside work to design, develop and test a system to quality assure CPD provision.

Wellcome has a vision to improve health for everyone and education underpins this. Ensuring that young people have an excellent science education, which enthuses them about science and encourages them to consider science and science-related careers, is key to realising that vision. The role that teachers play in this is vital: evidence is clear that the most important in-school factor for improving pupil outcomes is quality of teaching (Sutton Trust, 2011).

Furthermore, a study we commissioned from Education Datalab (Allen & Sims, 2017) found

that the odds that an individual teacher stays in the profession a year after participating in high quality subject-focused Continuing Professional Development (CPD) run by the National STEM Learning Centre are approximately 160% higher than similar non-participants. It makes sense, therefore, to support and train science teachers throughout their careers. To do so, Wellcome has embarked on a significant programme of work in England to embed continuous professional learning, focused on four objectives listed below. Whilst our interest is in supporting science teachers, our CPD programme seeks to embed CPD for teachers across all subjects and all phases, in order to bring about system-wide change. This is likely to be more sustainable than advocating for CPD for science teachers alone. The objectives of Wellcome's CPD programme are to:

1. Understand what constitutes high quality CPD for teachers;
2. Understand the barriers to participation in CPD;
3. Understand how teachers can be supported to access and participate in high quality CPD; and
4. Effect policy change in the area of teachers' CPD.

What is Wellcome?

Wellcome is a global charitable foundation. Its investment portfolio is currently valued at £27.5 billion and it aims to spend £5 billion helping people across the world over the next 5 years. Its approach is to:

- directly fund thousands of scientists and researchers, with funding schemes offering grants in biomedical science, population health, medical innovations, humanities and social science, and public engagement;
- identify areas where it can lead and make a significant change to the global response within 5-10 years, e.g. Ebola;
- work with policymakers to ensure that decision-making related to health is based on evidence; and
- engage the public and help everyone to be involved.





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What constitutes high quality CPD and what are the barriers to participation?

To better understand what effective CPD should look like, we turned to the research literature. The Department for Education's standard for teachers' professional development (Department for Education, 2016) provided a useful description of effective practice in the professional development of teachers. This standard is based on the literature, including the review of reviews, *Developing Great Teaching* (Cordingley *et al*, 2014) commissioned by the Teacher Development Trust, which found that subject-specific CPD is more effective in terms of its impact on pupil outcomes than generic pedagogic CPD. We felt that it was important to explore this further and commissioned a rapid evidence review of the extent, nature and impact of subject-specific CPD in UK schools.

Several important findings from this review, *Developing Great Subject Teaching* (Cordingley *et al*, 2018) were that:

- teachers acknowledge the benefits of subject-specific CPD but do less of it;
- teachers in England engage in less CPD overall and are less likely to engage in subject-specific CPD than in most other high performing countries;
- school leaders play a significant role in setting expectations for CPD and in influencing the extent to which it is prioritised, supported and integrated with other internal initiatives; and
- needs differ between schools, with the school's size and stage on the improvement journey appearing particularly influential. Schools that are seen to be struggling in terms of pupil outcomes and/or inspection results appear less likely to prioritise subject-specific CPD over more generic school improvement approaches.

In the study, subject-specific CPD was defined in terms of programmes and activities that focused on enhancing teachers' subject knowledge; how pupils learn in those subjects and how to teach them; and/or helping teachers to understand how generic CPD might apply to specific learning issues in the subjects they teach, in explicit and structured ways.

We commissioned further work (unpublished data) where we felt there were significant gaps in the evidence base: a survey of barriers to participation in subject-specific CPD (NFER Teacher Omnibus Survey, May 2017); a survey by Teacher Tapp (July 2018) to understand how in-service training (INSET) days are used by schools; and research commissioned from CFE Research to understand how teachers and school leaders would respond to a CPD mandate. The research commissioned from NFER found that almost two thirds of 1000 teachers surveyed in May 2017 had not attended any CPD in the 12 months prior to the survey and 80% said that they would like more externally-provided, subject-specific CPD. Furthermore, the survey found that a significant barrier to participation in high quality, externally-delivered CPD was lack of trust in the CPD offer.

How can teachers be supported to access and participate in CPD?

From the research, we developed a picture of the elements that we believe would have to be in place if all teachers were to participate in high quality CPD throughout their careers, and for a culture of professional learning to be embedded within the profession. The essential elements are:

- enough high quality CPD that is trusted by teachers and school leaders;





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- an understanding of the purpose of CPD and what 'high quality' means;
- time away from the classroom to participate in CPD; and
- funding for teachers to participate in high quality CPD.

Furthermore, the findings suggested that policy change requiring all schools to entitle their teachers to high quality CPD annually, as well as a system to quality assure CPD provision, could support the development of a sustained professional learning culture in schools. Wellcome's CPD programme sought to test these ideas.

The Wellcome CPD Challenge

As part of our CPD programme, a pilot study – the Wellcome CPD Challenge, managed by Sheffield Institute of Education (SIOE), part of Sheffield Hallam University, and evaluated by CFE Research – was set up to understand what schools would do if there were a CPD entitlement. Could they, for example, put in place the necessary structures and support for all teachers to access high quality CPD? A representative sample of 40 primary, secondary and special schools in South Yorkshire were challenged to meet a set of CPD criteria related to the amount and quality of CPD undertaken by teachers. These criteria are that:

- CPD meets the needs of the individual teacher and is predominantly focused on subject-specific development;
- CPD is high quality and aligns to the Department for Education's standard for teachers' professional development; and
- every teacher participates in a minimum of 35 hours of CPD annually.

The criteria are based on research evidence and stakeholder testing. We knew that subject-

specific CPD was more effective than generic, pedagogic CPD; that teachers felt that much of the time spent on CPD did not address their individual needs; and that the 2013 TALIS survey found that secondary school teachers in England participated in approximately 4 days of CPD on average (Sellen, 2016), with only half of secondary school teachers reporting effective teaching in their subject fields and in student evaluation and assessment (Micklewright *et al*, 2014). This suggested that teachers were participating in approximately 2 days, on average, of effective CPD annually. Increasing that to 5 days in the pilot would amount to a challenge for schools and also bring the entitlement in line with Scotland's mandate for teachers' professional development.

The pilot began in July 2018 with baseline data collection, and schools began the Challenge the following September. Each pilot school has named a Challenge Champion to lead engagement with the project and lead staff in school towards meeting the CPD criteria. Champions meet termly with Challenge Facilitators from SIOE to share their work towards the criteria. They also attend four half-day briefings and updates during the course of the pilot. For us to learn from the pilot, schools will participate in the evaluation until July 2021, a year after the support from SIOE ends, through an annual attitudinal survey and termly reporting of CPD participation.

What have we learned? The pilot has been running for a full year and emerging findings suggest that:

- schools have a desire to improve the quality of CPD in which their teachers participate;
- participation in the CPD Challenge is catalysing change for most schools, prompting reflection on the nature of CPD and how it is managed and evaluated in schools;





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- the CPD Challenge Champion is a vital broker of change;
- the CPD Challenge Facilitator is important in supporting change, through a variety of mechanisms (coach, critical friend, adviser...);
- schools may benefit from support in developing effective, robust systems for planning, recording and evaluating CPD;
- the time allocated to CPD is very varied across schools; much in-school CPD is often unrecognised;
- some schools are developing their practices from generic approaches to CPD towards more individualised and subject-specific approaches; and
- shifting school priorities mean that CPD sometimes falls down the school's agenda.

Quality assuring CPD

Uncertainty about the quality of the CPD they may be signing up for means that school leaders and teachers are reluctant to spend limited budgets on external provision. This is a significant barrier to teachers' participation in externally-provided CPD. However, the DfE's standard clearly states that expert challenge is an important factor in effective professional learning.

Therefore, we wanted to understand if a quality assurance (QA) system could help to improve the quality of CPD available and reassure schools in their choice of CPD providers and programmes. With the Education Endowment Foundation, we commissioned a consortium of SIOE, the Teacher Development Trust and the Chartered College of Teaching to scope the feasibility of a quality assurance system for teachers' CPD. Would such a system, once established, drive up participation in high quality CPD and help to ensure that poor quality provision was reduced? The original scope of the research was to concentrate only on external

CPD providers, but this was extended in response to schools' activity in the CPD Challenge and elsewhere: much of the CPD that schools provide for their staff is delivered internally. It was felt that the QA system could be extended to schools-as-providers in order to drive up the quality of in-house provision, especially where that was to be offered to other schools.

Stage 1 of the QA work, which included a rapid evidence review (Perry *et al*, 2019), found that:

- CPD can be quality assured through a range of systems and processes that have different purposes and outcomes. However, currently there is no consistent or widely-used process to assure the quality of teachers' CPD in England;
- Quality assurance systems for professional development can be broadly classified as:
 - kite-marking – CPD provision meets an accepted minimum standard, usually set by the organisations carrying out the kite-marking;
 - professional recognition – CPD provision is accredited against professional requirements and career progression pathways, with standards for quality set with reference to professional standards;
- In some high-performing education systems, there is no perceived need for quality assurance because the whole system is assumed to be high quality;
- In some other professions, for example in healthcare, quality assurance not only makes sure that CPD meets required standards, but also regulates who provides CPD and what they offer;
- All quality assurance systems are influenced by their wider social and professional contexts. If there is to be successful quality assurance for teachers' CPD in England, it needs to function within the wider influences of the English education system.





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Stage 2 of this work will involve testing and development of the proposed QA tool.

Advocating for policy change

Wellcome's CPD programme, therefore, aims to support transformative improvements in the quality and quantity of professional learning that teachers are able to access throughout their careers. We continue to advocate for policy change to entitle all teachers to high quality subject-specific CPD throughout their careers. To further inform this advocacy work, we have established a small programme of visits to other jurisdictions to learn as much as possible about their approaches to teachers' professional development and we have commissioned a cost benefit analysis of a CPD requirement from the Education Policy Institute.

We are facing a professional challenge for science educators. Without an embedded culture of CPD for all teachers, science education will face an uphill struggle to recruit and retain teachers; to ensure that science teachers' content knowledge remains current in rapidly advancing areas of science; and to ensure that teachers' pedagogical skills are based on the best available research evidence.

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