

# Education Committee - Supply of teachers inquiry

## Evidence from the Wellcome Trust

20 November 2015

### Key points

- The supply of teachers in England falls far short of demand, and this is even more acute in subjects like science and mathematics. The Government is concentrating on increasing teacher recruitment, but retention must also be improved and might be a more cost-effective strategy.
- The Government should continue to support high-quality continuing professional development, and assess how this can be used as a mechanism to improve teacher retention.
- In order to better understand sectoral needs more data must be collected on teacher vacancies, recruitment and retention, broken down by individual subjects, with more research into the underlying issues and impact of interventions.

### Introduction

1. The Wellcome Trust is a global charitable foundation dedicated to improving health. We support bright minds in science, the humanities and the social sciences, as well as education, public engagement and the application of research to medicine. We have a long standing commitment to making inspirational, high-quality science education available to all young people, spending around £9 million each year towards this aspiration.
2. Supporting teachers and creating a strong evidence base for education is at the heart of our education work. We recognise the importance of a strong teaching workforce and have committed £45 million of funding to the National Science Learning Centre since 2003, giving science teachers and technicians access to high-quality continuing professional development.

### Consultation questions

#### **Whether there is a 'crisis' in the recruitment and retention of teachers, including at senior levels of the profession, at a regional level, and by subject, and how the situation may develop during the 2015 Parliament**

3. There is undoubtedly a problem in the recruitment and retention of teachers in England. It is also important to understand shortages of other school staff, such as technicians. Teacher shortages are determined by the numbers needed by the sector, the numbers being recruited and the number leaving or returning to the profession. These numbers are affected by a range of factors, both within the sector and external to it. Indications are that current shortages will worsen over the next five years without effective and large-scale interventions.
4. Student numbers will rise significantly over the 2015 Parliament. It is estimated that between 2014 and 2023, there will be 379,000 more primary school pupils and 477,000 more secondary school pupils — the equivalent of 1,500 average size

primary schools and 500 average size secondary schools<sup>1</sup>. This growth in student numbers is not evenly distributed across the country, creating particular problems in certain areas. There is also a smaller cohort of graduation age students potentially reducing the number of graduates available to enter the workforce.

5. There has been a steady decrease in the percentage of Initial Teacher Training places filled since 2009, and the number of new secondary school teachers entering the workforce is not keeping up with demand<sup>1</sup>. This is particularly acute in the sciences and mathematics, with a 2015 survey showing that 52% of secondary school respondents had vacancies in mathematics and 50% in science<sup>2</sup>. It is estimated that more than 40% of graduates in mathematics, physics and chemistry would have to become teachers in order to meet requirements<sup>3</sup>.
6. Changes to qualifications and accountability may also impact the supply of teachers. New post-16 mathematics requirements will increase the burden on an already stretched mathematics workforce, and could lead to a higher workload, known to be a factor in the retention of teachers. Other changes, like the introduction of the English Baccalaureate, may also impact teacher supply and must be closely monitored.
7. Primary schools rarely organise their teaching by the subject expertise of their teachers, but this does not mean that they do not have specific subject needs. Not all primary teachers should have science degrees, but all primary schools need high quality leadership in the teaching of science and maths with access to the appropriate expertise<sup>4</sup>. Fewer than 10% of primary teachers have a STEM-related degree<sup>5</sup>, and while degree level science is by no means essential, most have no qualifications in STEM beyond GCSE. A recent study that documented the beneficial effect of teacher professional development in science on primary school teachers and their pupils, assessed the scientific knowledge of classroom teachers with key stage 3 SATs papers<sup>6</sup>. There was a large distribution in teacher performance, with knowledge averaging about the level of a 13-year-old student, and low performance was associated with low confidence in teaching primary science. It is important to consider the specialist subject needs that primary schools have and to develop a system to monitor the extent to which they are fulfilled.
8. Concern about teacher supply should extend to teaching quality. As well as supporting initiatives to increase the number of new science and mathematics teachers, the Government must also ensure that they have access to continuing professional development so they are able to deliver ongoing, high-quality teaching.
9. The Government's 2015 manifesto includes a commitment to "help teachers to make Britain the best country in the world for developing mathematics, engineering, science and computing skills". We know that having a good teacher is the most important factor for encouraging young people to study science<sup>7</sup>, so we welcome the Government's ambitious aim. Yet we also recognise the scale of the challenge to ensure all students are taught by appropriately qualified and skilled teachers; it is clear that more must be done to tackle it.

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<sup>1</sup>Education Endowment Foundation, 2015

<sup>2</sup>Association for School and College Leaders, 2015

<sup>3</sup>The Science and Mathematics Teaching Workforce, Royal Society, 2013

<sup>4</sup>Primary Science, is it missing out?, Wellcome Trust, 2014

<sup>5</sup>Science, technology, engineering and mathematics. Calculated using the school workforce census, excluding Bachelors of Education degrees.

<sup>6</sup>Evaluation of the impact of a continuing professional development course for primary science specialists, Wellcome Trust, 2015

<sup>7</sup>Wellcome Trust Monitor, 2012

**What the root causes of the current situation with regard to the supply of teachers are**

10. There are many factors that contribute to the supply of teachers, both external and within the sector, such as:

- economic climate
- job sector
- desirability of the profession
- region of the country, with particular issues in rural and coastal areas
- teaching in a disadvantaged school
- gender.

11. There is a lack of robust evidence for factors that contribute to teacher retention specifically, but surveys show that the following influence behavior<sup>8</sup>:

- workload
- resourcing
- professional development
- classroom support (e.g. provision of technicians)
- pupil behaviour
- career dissatisfaction.

12. Particular issues that impact the supply of science and mathematics teachers include<sup>9</sup>:

- the limited number of graduates in relevant subjects
- the desirability of science and mathematics qualifications for other, often highly-paid, jobs and
- teaching outside of a subject specialism - a quarter of physics graduates entering teaching specialised in mathematics, possibly to avoid teaching biology and chemistry<sup>10</sup>.

13. “Why Teach?”, a 2015 survey of over 1,000 teachers, showed that 50% of respondents considered leaving the profession in the six months before they were surveyed<sup>11</sup>. Science teachers were most likely to say they had considered leaving at 67%, whereas mathematics teachers were the least likely at 49%. Workload is the primary concern for teachers — there may be a link between a high workload in science teaching and an increased desire to leave the profession. It is important to understand these differences between subjects, and explore why science teachers are most likely to look to other areas of work.

14. Alongside the Department for Education, and many industry and Learned Society partners, we have invested heavily in the provision of science-specific continuing professional development. There is compelling evidence for the benefits of professional development on teachers and their students, but it may also improve teacher retention<sup>12</sup>. Research on the impact of National Science Learning Centre<sup>13</sup> courses showed that subject focused continuing professional development positively impacted on teachers’ intentions to stay in the profession.

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<sup>8</sup> TALIS, 2013

<sup>9</sup> The Science and Maths Teaching Workforce, Royal Society, 2013

<sup>10</sup> The Science and Mathematics Teaching Workforce, Royal Society, 2013

<sup>11</sup> Why Teach?, Pearson, 2015

<sup>12</sup> 10 years of impact on teachers, pupils and schools, National Science Learning Centre, 2015

<sup>13</sup> The Impact of Science Learning Centre continuing professional development on teacher retention and careers, Sheffield Hallam, 2012

## What further action should be taken by the Government to tackle teacher shortages

15. As stated in the Secretary of State for Education's letter to the Education Select Committee on this topic, the Government has implemented several initiatives to improve science and mathematics teacher supply, mostly focusing on recruitment. We would urge the Government to strengthen the evidence base of the impact of these interventions.
16. There is little evidence of whether bursary schemes and uplifted salaries increase recruitment in the long term, or of any adverse effects of these schemes on schools (e.g., if a teacher receives a salary £20,000 higher than comparable colleagues in the same school because of a particular recruitment scheme). The much higher bursaries for science and mathematics graduates in the secondary sector may also be drawing science and mathematics expertise out of primary schools<sup>14</sup>. It is also unclear whether bursaries affect teacher retention; arguably those recruited are more motivated by money and less by a love of the profession.
17. We have suggested a list of research questions we believe the Government should invest in understanding:
  - How does degree classification or Initial Teacher Training route relate to teaching skills and retention?
  - How do bursaries and salary uplift schemes affect recruitment and retention (including wider impacts on other teachers within a school, or impacts on primary school for interventions targeted at secondary schools)?
  - How can multiple training routes across the sector ensure national level needs are met?
  - How do changes in the curriculum and accountability, such as post-16 mathematics, affect teacher supply?
18. The current teacher wastage rate is estimated at 9%; this is not broken down by subject. Most of the Government's interventions currently focus on recruitment, but there is also room for improvement in the retention of teachers. The Department for Education has set up working groups to try to tackle teacher workload, known to be a factor for teachers leaving the profession, but surveys also show that teacher retention can be improved by good timetabling, mentoring and support, strong leadership, resources, professional development and appropriate expectations<sup>15</sup>. We would urge the Government to develop the evidence base for interventions focused on retention and consider their balance of investment in retention and recruitment; it is quite possible that improving retention is a more cost-effective route to enlarging the science and mathematics teacher workforce than investing in recruitment.

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<sup>14</sup> Get into teaching, DfE, 2015

<sup>15</sup> Teacher Retention and Specialist Support Staff and Technicians, CaSE, 2007