



Migration Advisory Committee – Partial Review of the Shortage Occupation List: Teachers

Response by the Wellcome Trust

Key points

- To help address an ongoing national shortage, chemistry, physics and maths teachers must be retained on the Shortage Occupation List (SOL).
- The quantity of teachers needed in these subjects in England is only set to intensify with rising pupil numbers and Government initiatives to increase uptake.
- The inclusion of science and maths teachers on the SOL has not deterred the Government from trying to address shortages domestically, and we have no reason to believe it will do so in the future.

Introduction

1. Wellcome is a global charitable foundation dedicated to improving health. Over the next five years, we plan to invest up to £5 billion in biomedical research and the medical humanities. Alongside this, 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 robust evidence base is at the heart of our education work. We recognise the importance of a strong teaching workforce and have committed £45 million to the National STEM Learning Centre since 2003, giving science teachers and technicians access to high-quality continuing professional development.
3. This response will focus on England, where the majority of the shortages in specialist teachers in chemistry, mathematics and physics exist. However, we note that the Teacher Workforce Planning Advisory Group in Scotland has drawn attention to continual under-recruitment of teachers in chemistry, computing, maths and physics.¹ Our conversations with colleagues in Wales also indicate the existence of shortages similar to those in England. It is our understanding that there is teacher mobility across the UK, but that movement from areas of over-supply has been insufficient to resolve overall shortages.

Consultation questions

The importance of specialist subject teachers

4. The National College for School Leadership has concluded that ‘specialist graduates should teach Maths and Science in all phases’.² Evidence suggests that pupils make less progress when their teacher does not have a degree in the relevant subject and subject specialist teachers are particularly important for more technical subjects such

¹ Teacher Workforce Planning Advisory Group (2013) <http://www.gtcs.org.uk/web/FILES/about-gtcs/dual-reg-consultation-report-of-the-twpwg.pdf>

² https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/340021/report-on-research-into-maths-and-science-teaching-in-the-shanghai-region.pdf

as science and maths.³ A Royal Society review found that teachers with good subject knowledge have a positive influence on students' attainment in and attitude towards sciences.⁴ Similarly, young people select good or bad teachers as the most frequent factor in encouraging or discouraging them from learning science respectively.⁵

5. High quality and inspirational teaching from well-trained teachers is therefore vital to ensure effective student engagement and we believe that the attainment of Qualified Teacher Status (QTS) contributes towards the minimum foundation needed for every teacher. Government proposals to remove the requirement for teachers to attain QTS, if implemented, would not impact upon the need for subject specialists in chemistry, physics and maths.

Persistent shortages of chemistry, physics and maths teachers

6. The Department for Education (DfE) acknowledges both the persistent shortage of maths and science (excluding biology) teachers in schools in England, and ongoing problems in recruitment.⁶ It has missed its targets to fill teacher training places four years running, with significant shortfalls in the occupations currently on the SOL.⁷ The National College for Teaching and Leadership recently told the National Audit Office that 'to some extent, the demand for maths teachers outstrips the available supply, given competition from other employers in the market', a view which was shared by DfE in regards to physics.⁸
7. The DfE school workforce statistics show that 2,700 out of 7,500 chemistry teachers lack a relevant post-A-level qualification in the subject.⁹ For mathematics, the figure is 8,863 teachers with no post-A-level qualification. Physics has the greatest challenge: the National Audit Office found that the proportion of lessons taught by non-specialist teachers was 28% (equivalent to 12,600 hours of teaching in 2014).¹⁰ The Institute of Physics estimates that 1,000 physics teachers a year would be required for each of the next 15 years to address current shortages.¹¹
8. In relation to Question 13 and 14, increasing salaries is not a realistic solution given growing constraints of school budgets.

Government initiatives

9. The value that the Government attaches to specialist teachers in the subjects that feature on the SOL can be inferred from the amount of money spent on attempts to address the shortages.¹² In 2015, a £67 million investment was announced to support measures including: efforts to bring former teachers back into the profession; recruitment of new teachers (e.g. generous tax-free bursaries of up to £30,000 for physics graduates); and £24 million to upskill 15,000 existing teachers who do not specialise in maths and physics.¹³
10. The Government has expanded the number of different routes into teaching, but it still struggles to attract adequate numbers of candidates for science and maths. The most popular new route is Schools Direct (school-led training), which now accounts for 36%

³ Wayne, A.J. and Youngs, P. (2003) *Teacher Characteristics and Student Gains: a review*, *Review of Educational Research* 73 (1): 89–122.
doi:10.3102/00346543073001089

⁴ Royal Society (2008) A 'state of the nation' report on the participation and attainment of 14–19 year olds in science and mathematics in the UK

⁵ Wellcome Monitor survey, 2012

⁶ <https://www.nao.org.uk/wp-content/uploads/2016/02/Training-new-teachers.pdf>

⁷ <http://www.publications.parliament.uk/pa/cm201617/cmselect/cmpublic/73/73.pdf>

⁸ <https://www.nao.org.uk/wp-content/uploads/2016/02/Training-new-teachers.pdf>

⁹ School workforce in England: November 2015 (<https://www.gov.uk/government/statistics/school-workforce-in-england-november-2015>)

¹⁰ <https://www.nao.org.uk/wp-content/uploads/2016/02/Training-new-teachers.pdf>

¹¹ Physics and: teacher numbers, Institute of Physics September 2010. http://www.iop.org/news/10/sep10/file_44832.pdf

¹² <https://www.gov.uk/government/news/national-teacher-recruitment-drive-gets-underway>

¹³ <https://www.gov.uk/government/news/major-push-to-get-more-maths-and-physics-teachers-into-our-classrooms>

of new trainee teachers.¹⁴ However this route has missed its targets for teachers in sciences and mathematics by over 200 places in each subject.¹⁵

11. Earlier this year, the National Audit Office criticised DfE for 'insufficient' analysis of the effectiveness of government interventions,¹⁶ an observation echoed by the Education Select Committee during its recent 'supply of teachers' inquiry. A TES analysis of figures from DfE found that despite a near tripling in the value of bursaries, there has been a 16% drop in the number of science trainees on eligible courses, and a 15% drop in equivalent maths trainees.¹⁷ In addition to this, a 2015 report by the National Foundation for Educational Research found that around 10% of teachers leave the profession each year — a percentage that has remained relatively stable for a number of years.¹⁸

Shortages set to intensify

12. The annual number of non-European Economic Area (non-EEA) teachers in England using the SOL has risen by 150% over the past four years (220 to 337).¹⁹ Secondary school student numbers are forecast to rise by 9% (up to 276,000) between 2014-15 and 2019-20.²⁰ DfE predicts that for 10% of Key Stage 4 students, their science teaching time will double from September 2016 as they transfer from Core Science to the Combined Science GCSE (i.e., moving from one to two GCSEs).²¹
13. New school accountability measures and an increased emphasis on science in the curriculum could also lead to a rise in the numbers of students studying science, but a lack of specialist teachers may mean that many schools will be unable to expand their science provision, or are forced to rely on even more teachers without the appropriate qualifications. The Conservative Party's 2015 election manifesto pledged to 'make Britain the best place in the world to study maths, science and engineering'. To achieve this goal, it acknowledged that it would need to 'train an extra 17,500 maths and physics teachers over the next five years'.²²
14. Shortages may also intensify if there is a decrease in teachers from the European Economic Area (EEA, relevant to Question 1).²³ The anticipated period of uncertainty as to these teachers' employment status caused by Brexit has the potential to both cause teachers already here to leave and also deter new recruits, aside from whether or not there are any longer term restrictions on their ability to teach in the UK.
15. We believe that DfE has explored the options set out by MAC's 'Sensible' approach through a range of funded initiatives. Many of these interventions are relatively new, and it will take time to evaluate their effectiveness. In the meantime, there remains a considerable shortage of teachers in chemistry, mathematics and physics. For this reason, it is imperative that these remain on the SOL. Although every individual is helpful, relatively few non-EEA teachers use the SOL route. As a result, their presence is unlikely to reduce the amount of resources the Government (or industry) is willing to allocate towards rectifying teaching shortages from domestic candidates. As the situation has become increasingly acute, the Government has responded with additional funding.

¹⁴ UCAS, End of Cycle Report 2015

¹⁵ *The funding environment for universities 2014. Universities UK. The impact of initial teacher training reforms on English Higher Education Institutions,*

<http://www.universitiesuk.ac.uk/highereducation/Documents/2014/ImpactOfITTrreformsOnEnglishHEIs.pdf>

¹⁶ <https://www.nao.org.uk/wp-content/uploads/2016/02/Training-new-teachers.pdf>

¹⁷ <https://www.tes.com/news/school-news/breaking-news/exclusive-new-analysis-reveals-training-bursaries-are-failing-tackle> In 2011-12 there were 2,232 maths trainees and 2,732 science trainees. By 2015-16, these figures had fallen to 1,888 and 2,289 respectively

¹⁸ Worth, J., Bamford, S. and Durbin, B. (2015). *Should I stay or Should I Go? NFER Analysis of Teachers Joining and Leaving the Profession*. Slough: NFER

¹⁹ Although the number of non-EEA out-of-country applications using the Shortage Occupations List route was low in 2012 (59 out-of-country visas granted), it has risen sharply to 241 in 2015. Concurrently, the number of in-country visas has fallen from 161 in 2012 to 96 in 2015

²⁰ <http://www.publications.parliament.uk/pa/cm201617/cmselect/cmpubacc/73/73.pdf>

²¹ P30 - https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/362918/teacher-supply-model-user-guide.pdf

²² https://issuu.com/conservativeparty/docs/ge_manifesto_low_res_bdec3a47a0faf?e=16696947/12362115 p35

²³ The DfE 'does not hold information relating to the country of origin of teachers'. It does hold information on the number of qualified EEA and non-EEA teachers who have registered or converted their qualifications to QTS equivalent in England, and will publish this information in November 2016 - Response by the Department for Education (16/09/16) to an FOI request submitted by Wellcome

16. The value of every individual science and maths teacher in the context of a national shortage which — based on the evidence — is only set to intensify, means it is imperative that chemistry, maths and physics teachers are retained on the SOL. It is not a silver bullet, but it is a crucial tool in alleviating part of the shortfall in teachers in these key subjects.