Position Statement

The recruitment and retention of chemistry teachers in England

Last reviewed: 2025

Summary

Longstanding chemistry teacher shortages in England are concerning for the Royal Society of Chemistry because we believe that all students should have an unbroken chain of experts [1] teaching them the sciences throughout their school education.

The teacher recruitment and retention crisis should be addressed with long-term solutions that can withstand population and economic fluctuations.

Crucially, working conditions for teachers need to improve to help retain the current workforce and to make teaching a more attractive career option for new entrants and returners.

Introduction

The Department for Education (DfE) use their Teacher Workforce Model[2] to set annual target numbers of trainees needed to start postgraduate initial teacher training. The number of people training to be chemistry teachers has frequently been below these government targets.[3]

Ensuring an adequate supply of chemistry teachers is a complicated issue. It is affected by the size of the pupil population, the age profile of the teaching workforce, teacher retention rates and the extent to which initial teach training recruitment targets have been met in previous years. All these factors are considered in the Teacher Workforce Model. Both supply of and demand for chemistry teachers can show regional and local variation as well as variation by type of school.[4] However, the DfE's Teacher Workforce Model only considers national needs

[1] The term 'expert' is used here to describe a teacher with appropriate subject knowledge and pedagogical content knowledge for the curriculum and classes they are required to teach.

[2] The 'Teacher Workforce Model' has been used since 2022-23, prior to that the DfE used the 'Teacher Supply Model' https://www.gov.uk/government/collections/statistics-teacher-training#postgraduate-targets-(using-the-teacher-workforce-model

[3] DfE. Initial Teacher Training Census data: https://www.gov.uk/government/collections/statistics-teacher-training#census-data

[4] Schools with higher proportions of students eligible for free school meals and those in the most deprived areas are less likely to have science teachers with a qualification relevant to the main science discipline they teach. See:
Kirby, P., & Cullinane, C. (2017). Sutton Trust Research Brief – Science Shortfall. http://www.suttontrust.com/wp-content/uploads/2017/01/Science-shortfall_FINAL.pdf.
Schools with 'outstanding' Ofsted ratings and those with low levels of school deprivation are more likely than others to advertise for specialist biology, chemistry, or physics teachers rather than general science teachers. This is despite evidence to show that advertising for general science teachers is no more effective that advertising for specialist posts. See:

The state of the economy and the availability and attractiveness of other employment opportunities for chemistry graduates, can affect the recruitment and retention of teachers. Historically, teacher shortages have been less pronounced times of economic recession.[5]

Our recommendations

Good working conditions are key to retaining the existing workforce and making chemistry teaching a more attractive career for potential new or returning teachers.

A significant factor in this is a sustainable workload. Teachers often cite an unsustainable workload as a key reason for leaving or wanting to leave their teaching roles.[6] Chemistry trained teachers are often required to teach biology and/or physics. This is likely to increase the time spent on lesson preparation for less experienced teachers and could mean that early career teachers of the sciences have to cope with particularly high workloads.

Evidence suggests that student behaviour has overtaken accountability as teachers' top source of stress. It is also the biggest source of additional workload for teachers and the principal factor, aside from pay, that would persuade those who are thinking about leaving, to stay another year.[7]

There is some evidence that participation in high quality subject-specific CPD can improve teacher retention.[8] Related to this, teachers who have perceived control over their professional development and goal setting have been shown to report higher job satisfaction and a greater intention to stay in the profession.[9]

Government should:

1. Ensure that effective strategies are in place to:
    a. Address unsustainable science/chemistry teacher workload.
    b. Promote a culture of support and development for teachers in schools (including Continuing Professional Development (CPD) and mentoring) in which teachers are trusted to take ownership and control of their own development.

Gatsby (2018). Specialist science teacher recruitment in England 2016-2017 https://www.gatsby.org.uk/uploads/education/specialist-science-teacher-recruitment-2016-2017-310118.pdf
See also an update: https://www.gatsby.org.uk/education/latest/latest-data-indicates-substantial-inequalities-in-the-nationwide-recruitment-of-specialist-science-teachers

[5] Benhenda A. (2020) Briefing note: The impact of recessions on teacher labour market, Centre for Education Policy & Equalising Opportunities, UCL https://repec-cepeo.ucl.ac.uk/cepeob/cepeobn4.pdf

[6] See:
National Audit Office. (2017, September). Retaining and developing the teaching workforce. https://www.nao.org.uk/wp-content/uploads/2017/09/Retaining-and-developing-the-teaching-workforce.pdf
Science Teaching Survey (2023), Royal Society of Chemistry. *https://www.rsc.org/policy-evidence-campaigns/chemistry-education/education-reports-surveys-campaigns/the-science-teaching-survey/2023/understaffing-exacerbates-pressure/*

[7] School Surveys, powered by Teacher Tapp, (2024, November). *Behaviour Barometer: Essential insights for leaders* https://zhi5rt9t.sibpages.com/

[8] Allen, R. and Sims, S. (2017) Improving Science Teacher Retention: do National STEM Learning Network professional development courses keep science teachers in the classroom? https://cms.wellcome.org/sites/default/files/science-teacher-retention.pdf

[9] Worth, J. and Van den Brande, J. (2020) Teacher autonomy: how does it relate to job satisfaction and retention? Slough: NFER. https://www.nfer.ac.uk/publications/teacher-autonomy-how-does-it-relate-to-job-satisfaction-and-retention/

c. Support Early Career teachers to develop their subject-specific expertise as part of the Early Career Framework.
d. Invest in leadership and management programmes for school leaders which support a positive employment culture and address issues associated with poor teacher retention.

School leaders and heads of science departments should:

2. Investigate and evaluate science/chemistry teacher workload in their schools and introduce strategies to address excessive workload where it occurs. This could involve initiatives relating to timetabling,[10] planning, marking, technician support, professional development, or mentoring.

3. Ensure that their school behaviour policy is clear and straightforward with rules and sanctions for poor student behaviour applied consistently across the school.

4. Consider how part-time and flexible working options can be used to support teacher retention in their schools.

Ofsted should:

5. Continue to assess how effective schools are at supporting and retaining teachers.

Unless teaching is considered a rewarding career option compared with the alternatives available to chemistry graduates, attracting enough suitably knowledgeable new chemistry teachers will be a challenge. We acknowledge that at least in the short term, financial incentives have the potential to help reduce the chemistry teacher shortages.

Government should:

6. Regularly evaluate teacher recruitment and retention incentives to assess their effectiveness.

7. Ensure that recruitment and retention incentives consider local, regional, and national teacher shortages.
8. Invest in high-quality, subject-specific professional development for teachers. This should: - Meet the needs of a broad range of teachers to account for differing prior knowledge, and - Include professional development opportunities to help teachers with a background in one science discipline gradually gain the expertise needed to teach curriculum content in one or both of the other school science disciplines.
9. Ensure that the geographical distribution of teacher training places takes account of national, regional, and local need.

[10] This could include 'sympathetic timetabling' for early career teachers (ECTs) whereby ECTs focus on fewer year groups allowing them reduce planning time by repeating lessons for different classes and/or predominantly teaching the science discipline where they have the most existing expertise. See also our policy position on Secondary school teachers' deployment according to their subject expertise in the sciences https://www.rsc.org/globalassets/22-new-perspectives/education/03-teachers-for-all/royal-society-of-chemistrys-policy-position-on-secondary-school-teachers-deployment-according-to-their-expertise.pdf

To track the long-term effectiveness of teacher recruitment and retention, government should:

10. Collect and publish discipline-specific information about the ‘general/combined science’ teachers recorded in the School Workforce Census. In particular, whether they have post-A Level qualifications relevant to the individual science discipline content they teach within general/combined science courses.

For any queries relating to this position statement, please contact the Education Policy team: EducationPolicy@rsc.org