

Written evidence from the Royal Society of Chemistry to the Education Select Committee concerning teacher recruitment, training, and retention.

20 April 2023

Introduction

1. The Royal Society of Chemistry is an international organisation connecting chemical scientists with each other, with other scientists, and with society as a whole. Founded in 1841 and based in London, UK, we have an international membership of around 50,000. We use the surplus from our global publishing and knowledge business to give thousands of chemical scientists the support and resources required to make vital advances in chemical knowledge. We bring people together to spark new ideas and new partnerships and we support teachers to inspire future generations of scientists.
2. The Royal Society of Chemistry is submitting this evidence because we believe that all students should have an unbroken chain of experts¹ teaching them chemistry content throughout their school education. An excellent chemistry education is vital for the future of the chemical sciences as well as other sectors. It sets the foundations for progression into further learning and the profession and can be a valuable experience for young people regardless of their career aspirations.
3. This response has been informed by our established policy positions, published research and guidance, discussions with the other science learned societies, and members of our wider community of initial teacher trainers and subject knowledge enhancement course providers.

The current situation regarding teacher recruitment and retention

What are the main factors leading to difficulties recruiting and retaining qualified teachers?

Which subjects are most affected?

4. Recruitment to postgraduate teacher training was significantly below target for the 2022/23 academic year. The National Foundation for Educational Research (NFER) predict that there will a slight improvement next year, but it is still likely to be below target.² The number of people training to become chemistry teachers is still frequently below DfE targets.³
5. The recruitment of chemistry teachers can be more challenging than for many other subjects in part because teacher salaries do not compare favourably to the earning potential of STEM graduates.⁴ In addition, the number of people accepted onto UK chemistry undergraduate

¹ We use the term 'expert' to describe a teacher with appropriate subject knowledge and pedagogical content knowledge for the curriculum and classes they are required to teach.

² McLean, D., Worth, J. and Faulkner-Ellis, H. (2023). Teacher Labour Market in England: Annual Report 2023. Slough: NFER

https://www.nfer.ac.uk/media/5286/teacher_labour_market_in_england_annual_report_2023.pdf

³ Initial Teacher Training Census, DfE <https://www.gov.uk/government/statistics/initial-teacher-training-trainee-number-census-2022-to-2023>

⁴ Worth, J., Tang, S. and Galvis, M. (2022). Assessing the impact of pay and financial incentives in improving shortage subject teacher supply. Slough: NFER

courses has declined in recent years. The latest UCAS figures show that 4,900 students were accepted to chemistry courses for the 2022/23 academic year⁵ This is a 12% drop from 2019 (5,565) and is part of a pattern across this period. This reduction in the pool of potential trainee chemistry teachers is a worry and could add to the problems of under-recruitment in the next few years. In the longer term, there is risk of a vicious cycle developing, with fewer chemistry graduates available to become the expert chemistry teachers we need to inspire future generations to pursue careers in the chemical sciences (including in teaching roles).

6. Data from TeacherVac⁶ shows that teacher vacancies in February this year were considerably higher than in February 2019, the year before the pandemic.⁷ Our research also suggests that schools are struggling to fill vacancies. We found that 64% of state secondary schools across the UK were understaffed in at least one of the three sciences, with 30% saying that had insufficient numbers of chemistry teachers.⁸
7. The Department for Education's (DfE) recent research found that more than 70 per cent of teachers thought their workload was unacceptable.⁹ 'Workload' is the reason most often cited for why teachers leave.¹⁰ The results of our *Science Teacher Survey 2022* reinforce these findings as stress, exhaustion/burnout as well as high workload and lack of work/life balance were the most common reasons teachers gave for considering leaving the profession.¹¹ Addressing these issues would help retain the current workforce and make it a more attractive career option for new entrants and returners.
8. Relative differences in teacher shortages between the science disciplines inevitably affects how schools deploy their science teachers.¹² Research we commissioned¹³ found that there is a widespread practice of teachers being deployed outside of their 'specialist' science discipline. This is a problem, as the most effective teachers have deep subject and pedagogical content knowledge.¹⁴ Moreover, passionate expert teachers of chemistry can influence students' decisions to continue their studies in the subject and pursue a STEM related career.

https://www.nfer.ac.uk/media/4957/assessing_the_impact_of_pay_and_financial_incentives_in_improving_shortage_of_subject_teacher_supply.pdf

⁵ UCAS undergraduate end of cycle data resources 2022 <https://www.ucas.com/data-and-analysis/undergraduate-statistics-and-reports/ucas-undergraduate-end-cycle-data-resources-2022>

⁶ TeacherVac vacancy service for schools and teachers in England <https://www.teachvac.co.uk/>

⁷ McLean, D., Worth, J. and Faulkner-Ellis, H. (2023). Teacher Labour Market in England: Annual Report 2023. Slough: NFER

https://www.nfer.ac.uk/media/5286/teacher_labour_market_in_england_annual_report_2023.pdf

⁸ Working with the Institute of Physics our Science Teacher Survey 2022 captured the views of more than 3,700 UK science teachers and technicians in April 2022 <https://www.rsc.org/new-perspectives/talent/the-science-teaching-survey>

⁹ DfE (2023) Working lives of teachers and leaders – wave 1, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1148571/Working_lives_of_teachers_and_leaders_-_wave_1_-_core_report.pdf

¹⁰ National Audit Office. (2017). *Retaining and developing the teaching workforce*.

<https://www.nao.org.uk/wp-content/uploads/2017/09/Retaining-and-developing-the-teaching-workforce.pdf>

¹¹ Royal Society Of Chemistry (2023) Science Teacher Survey 2022 <https://www.rsc.org/new-perspectives/talent/the-science-teaching-survey/2022/burnout-and-workload/#reasons-for-leaving>

¹² The shortage of expert physics teachers is more pronounced than that of chemistry teachers, and schools often find it relatively easy to recruit biologists.

¹³Shift Learning (2019) Science timetable models research

https://www.rsb.org.uk/images/science_timetable_models_report_ASE.pdf

¹⁴ Coe, R., Aloisi, Sutton Trust report (2014) What makes great teaching? Review of the underpinning research. <https://www.suttontrust.com/wp-content/uploads/2014/10/What-Makes-Great-Teaching-REPORT.pdf>

How does the situation differ across the country and across different types of schools and colleges?

What impact does this have on pupils, particularly disadvantaged pupils?

9. Inequalities exist when it comes to the distribution and deployment of specialist teachers - 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.¹⁵
10. We are concerned that the difficulties recruiting teachers of chemistry could be further exacerbated by the results of last year's reaccreditation of Initial Teacher Training (ITT) providers. The number of providers is set to decrease by about 25% (179 providers compared to 240 previously) in 2024. This has the potential to leave 'cold spots' with inadequate teacher training provision in the Northeast, Southwest and East of England.¹⁶ Since the majority of new teachers secure jobs close to where they have trained this could make recruitment harder for schools in these regions. It is not yet clear the extent to which the new partnerships encouraged by the DfE will be able counter this uneven provision.
11. Conversations we've had over the past year with ITT providers along with a recent survey¹⁷ of people currently working in ITT roles with science trainees, have led us to be concerned about the general 'mood' amongst teacher educators. One provider thought that the new quality requirements would reduce their autonomy and make it harder to embed research informed teaching practices tailored to the needs of their local area. They told us that they felt like there were being asked to develop and train teaching 'technicians' of the future rather than critically reflective teachers. Individuals have also reported an increase in their workload brought about by preparations for reaccreditation and the new quality requirements and some have confided that they are considering a change of role or early retirement. The potential loss of expertise from the teacher training and educational research is something that DfE should be mindful of.

Action the Department for Education (DfE) should take to address the challenges in teacher recruitment and retention.

12. In recent years the Government have made efforts to reduce teacher workload and there has been some improvement in this area. However, working hours remain higher for teachers than for other graduates.¹⁸ Working excessively long hours is not sustainable for most teachers. Those who feel overworked and are unhappy with their work life balance, are more likely to consider leaving. **DfE needs to do more to enable schools to further reduce teachers' workload to help retain the existing workforce and make teaching a more attractive profession for potential new recruits.**

¹⁵ 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 . AND: DfE (2016) Schools workforce in England 2010 to 2015: trends and geographical comparisons <https://www.gov.uk/government/statistics/local-analysis-of-teacher-workforce-2010-to-2015>

¹⁶ Education Policy Institute (2022) The reaccreditation of ITT providers: Implications for STEM subjects. <https://epi.org.uk/publications-and-research/the-reaccreditation-of-itt-providers-implications-for-stem-subjects/>

¹⁷ In April 2023 the Association for Science Education surveyed ITT 46 course leaders, tutors, mentors and other working in science ITT in England. The results have not been published but a summary of the findings have been shared with us.

¹⁸ McLean, D., Worth, J. and Faulkner-Ellis, H. (2023). Teacher Labour Market in England: Annual Report 2023. Slough: NFER https://www.nfer.ac.uk/media/5286/teacher_labour_market_in_england_annual_report_2023.pdf

13. The DfE's recent research found that teachers who worked flexibly in some way were more likely to report being satisfied with their job most or all of the time.¹⁹ **The DfE should work with schools to explore how different flexible working options can be embedded schools.**
14. To ensure there are enough experts teaching the sciences and address the relative differences in shortages between the disciplines, teachers must be supported to develop and where appropriate, expand their subject and pedagogical content knowledge. This includes professional development 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.²⁰ Ongoing professional learning has also been shown to improve teacher retention.²¹ Our *Science Teacher Survey 2022* found that teachers who were not able to access adequate subject-specific Continuing Professional Development (CPD) in the previous three years were more likely to consider leaving the profession in the next five years (not due to retiring).²² **Government should invest in a systematic approach to CPD for teachers in the sciences to ensure teachers have access to quality assured professional development throughout their careers.**
15. We have heard reports of an increasing number of international applicants being offered places on physics ITT course this year. Presumably this is related to the fact that international physics trainees could now be eligible for a £27,000 bursary (or £29,000 scholarship)²³ along with the recently announced £10,000 relocation payment²⁴. It's too early to say what proportion of these candidates will be converted to trainees in September and whether they will gain QTS, but **we recommend the DfE monitor the success of this scheme (including retention rates) as it may be a good intervention to respond to severe shortages in other subjects in the future.**
16. Financial incentives designed to improve recruitment and sometimes retention of teachers in shortage subjects have been in place, in one form or another, for many years yet their evaluation appears quite piecemeal. **DfE should gather and publish evidence about the cost effectiveness of different teacher recruitment and retention financial incentive schemes and use this to inform future plans.**

¹⁹ Working lives of teachers and leaders – wave 1, DfE (2023)

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1148571/Working_lives_of_teachers_and_leaders_-_wave_1_-_core_report.pdf

²⁰ To facilitate this we support the Institute of Physics recommendations for a systematic approach to subject specific professional development detailed in their 'Subjects matter' report

<https://www.iop.org/sites/default/files/2020-12/Subjects-Matter-IOP-December-2020.pdf>

²¹ Education Policy Institute (2020), Evidence review: The effects of high-quality professional development on teachers and students. <https://epi.org.uk/publications-and-research/effects-high-quality-professional-development/>

²² Royal Society of Chemistry (2023), Science Teacher Survey 2022. <https://www.rsc.org/new-perspectives/talent/the-science-teaching-survey/2022/inadequate-professional-development/#subject-specific-cpd>

²³ Get Into Teaching <https://getintoteaching.education.gov.uk/non-uk-teachers/train-to-teach-in-england-as-an-international-student>

²⁴ DfE Guidance (published 6 March 2023), International relocation payments <https://www.gov.uk/government/publications/international-relocation-payments/international-relocation-payments>

How well does the current teacher training framework work to prepare new teachers and how could it be improved?

What has been the impact of the Early Career Framework implemented in September 2021?

Are there ways in which teacher training could be improved to address the challenges in recruitment and retention?

17. Subject Knowledge Enhancement (SKE) courses are particularly valuable as a method to improve recruitment in shortage subjects. They allow career changes to refresh their knowledge and enable graduates with a closely related degree or A-level in the subject to have the confidence to train to teach in a shortage subject. Last year there was a considerable reduction in the number of people (as well as the estimated proportion of the ITT cohort) taking SKE courses in chemistry.²⁵ A similar pattern has been observed for the last couple of years in the uptake of SKE courses in physics and biology. We believe this drop is a result of providers competing over a smaller pool of applicants. We suspect some providers are less likely to make completion of SKE a condition of their offer. Candidates are accepting these lower offers, but the risk is they will enter the profession without a suitable level of subject knowledge. This in turn could make their training and early career experiences more challenging and ultimately increase the chances of them leaving the profession.
18. Anecdotally, we have heard of a few candidates who have rejected offers which required SKE because financially the £175 per week bursary does not cover their childcare costs. **We recommend that the DfE consider increasing the SKE bursary to at least its previous level of £200 per week to make the completion of the courses accessible to a wider range of candidates.**
19. Following the pandemic, the number of in person or blended SKE courses has decreased. For chemistry SKE, there is real benefit to having at least 10% of the course set aside for in person supervised chemistry laboratory work to give trainees the confidence to conduct practical work with their future classes. **DfE should review SKE provider funding and provide additional funding for blended or face-to-face courses which enable students to develop their skills in hands-on practical work in the sciences.**
20. Applications to ITT in STEM subjects often happen late in the cycle making it hard to fit in even the even the shortest eight-week SKE courses. For this reason, a pragmatic solution could be to re-introduce the two to four week face-to-face 'booster' SKE courses. **DfE should consult with providers to see if this would be a beneficial addition to the suite of SKE courses.**
21. There is lack of data published about SKE courses. **DfE should publish the actual number of SKE students by subject who go on to join ITT programmes. They should also investigate the offer-rejection rate where SKE is a condition of the offer compared to similar candidates where it is not.**
22. We are supportive in theory of the Early Career Framework (ECF), especially the emphasis on mentoring and reduced timetable for teachers in their second year. However, we do have some concerns. An increased demand for mentors to meet the requirements of both the Early Career Framework and ITT quality requirements, is likely to be problematic for schools which don't have enough suitable teachers to take on the extra responsibilities. This could be a particular problem for the sciences, where teacher shortages are already an issue. A review of

²⁵ Evidence gathered from a number of FOI requests made by Mark Crowley. See: https://www.whatdotheyknow.com/request/ske_numbers_by_provider_3
https://www.whatdotheyknow.com/request/ske_numbers_by_provider_5
https://www.whatdotheyknow.com/request/ske_numbers_by_provider_6
https://www.whatdotheyknow.com/request/ske_numbers_by_provider_2021
https://www.whatdotheyknow.com/request/ske_numbers_by_provider_2122

the ECF one year after its implementation²⁶ identified issues with the additional workload it created for both early career teachers and their mentors as well as concerns about repetition from the ITT year. The review also highlighted concerns about the lack of subject-specificity in the framework with 60% of mentors to early career secondary teachers reporting that the ECF was not subject specific enough. **DfE should work with ECF training providers and subject associations to consider how the ECF can be made more subject specific.**

²⁶ Ford, I., Allen, B, and Wespieser, K. (2022), Early Career Framework, one year on.
<https://teachertapp.co.uk/app/uploads/2022/10/2022-10-Early-Career-Framework-TT-Gatsby-Final.pdf>