

Evidence from the Royal Society of Chemistry to the Children, Young People and Education Committee, concerning teacher recruitment and retention in Wales.

6 June 2025

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 education providers and teachers of the sciences in Wales

This submission addresses the following questions set by the Committee's inquiry:

- Barriers to recruitment
- Factors affecting retention
- Impact on learners
- Impact on delivery of educational reforms
- Impact on teachers and the wider workforce
- Addressing recruitment and retention

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.

Barriers to recruitment

Recruitment into chemistry ITE:

4. ITE providers in Wales have told us that in recent years chemistry has been the hardest of all the sciences to recruit. In 2023/24 only seven people passed their chemistry PGCE.² This is the lowest it has been for at least ten years and was only just over 10% of the chemistry allocation.

Financial barriers

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.³ 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. At least in the short term, financial incentives to train have the potential to help reduce the chemistry teacher shortages.
6. However, the bursary for chemistry ITE in Wales is probably not enough to be effective. Providers have told us that many potential ITE students, especially career changers with families or other obligations, cannot afford either the full-time or two-year part-time PGCE. Table 1. below shows that for UK students pursuing an English medium chemistry PGCE in Wales, once tuition fees have been deducted, the bursary is only £2,465 for a full-time course. Table 2. shows that even with the Welsh language incentive, the take-home bursary after fees is less than half the equivalent amount that an ITE chemist in England receives.
7. The difference in bursary amount for England compared with Wales means that some potential new teachers are choosing to train in England rather than Wales (especially those who live in the North and East of Wales). Even those who want to have some experience of the Welsh system may still choose to take a course across the border. A PGCE tutor told us that a third-year computer science undergraduate who he had spoken to recently said that he couldn't afford to stay in Wales to do teacher training. Instead, he was planning to go to Manchester where he would receive a higher bursary and still get experience of teaching in Wales which he expected to be able to do through a school placement in North Wales.
8. The same tutor also shared that when he asked a school if they could take a student placement next year, they said they were full up with English university trainees and would prioritise English students over Welsh ITE placements as the English university paid more.

² Education Workforce Council. Initial teacher education (ITE) student results 2023-24. [ITE 2023-2024](#)

³ Worth, J., Tang, S. and Galvis, M. (2022). Assessing the impact of pay and financial incentives in improving shortage subject teacher supply. Slough: NFER
https://www.nfer.ac.uk/media/4957/assessing_the_impact_of_pay_and_financial_incentives_in_improving_shortage_of_subject_teacher_supply.pdf

9. The Open University salaried route is gaining popularity, especially in Welsh medium schools. The large difference between the salary on this route and the bursary amount may ultimately impact the sustainability of traditional university PGCE courses, reducing the choice of routes into teaching.

Table 1. Comparison of ITE costs and financial incentives / salary in Wales and England for a UK English language chemistry student in academic year 2025/26.

	Welsh University Route	Open University Salaried Route	English unsalaried route
Time to complete	1 year	2 years	1 year
Financial incentive / salary	£12,000 incentive - Science	£21,812 salary (subject to pay review)	£29,000 bursary
Tuition fee	£9,535	£0	£9535
Total after tuition fee	£2,465	£21,812 (subject to tax)	£19,465

Table 2. Comparison of ITE costs and financial incentives / salary in Wales and England for a UK Welsh language chemistry student in academic year 2025/26.

	Welsh University Route	Open University Salaried Route	English unsalaried route
Time to complete	1 year	2 years	1 year
Financial incentive / salary	£12,000 incentive - Science £5,000 incentive - Welsh	£21,812 salary (subject to pay review)	£29,000 bursary
Tuition fee	£9,535	£0	£9535
Total after tuition fee	£7,465	£21,812 (subject to tax)	£19,465

Closure of university chemistry departments

10. The recent closure of chemistry departments at Bangor University and the University of South Wales, leaves Cardiff and Swansea Universities as the only providers of undergraduate chemistry courses in Wales.

11. The resulting “cold spot” for chemistry undergraduate provision in North Wales has reduced the pool of potential trainee chemistry teachers in the area. ITE at Bangor University appears to already be feeling the effects of the undergraduate course closure as they have no chemists on their PGCE programme this academic year.
12. The lack of opportunities for young people to study chemistry near to where they live is also worryingly because research has shown that individuals who live with their parents as undergraduates are more likely to become teachers than their peers who live away from home.⁴ Such individuals were also less likely to leave the profession within the first four years of teaching. Although this research used data from England, the findings may well be applicable to Wales.
13. 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). The risk is particularly acute for Welsh-medium provision as Bangor allowed undergraduates to study chemistry in Welsh.

Geographical issues and Welsh medium uptake

14. Long travel distances to rural placement schools (especially in North and West Wales) can deter PGCE applicants. The problem is often more pronounced for Welsh-medium placements, especially in remote areas.

Recruitment into chemistry teaching posts:

15. Our annual Science Teaching survey, which captures the views and experiences of science teachers and technicians in the UK and Ireland, has revealed that understaffing is a problem in a considerable proportion of Welsh state-funded secondary schools. In the latest survey from Spring 2025, 40% of respondents reported that they were understaffed for chemistry teachers in their school.⁵ This figure was higher than in England and Scotland and is higher than reported in our previous three years of surveys.⁶

⁴ Jerrim, J., (2024) *Why do “home birds” decide to become teachers?*

<https://ffteducationdatalab.org.uk/2024/09/why-do-home-birds-decide-to-become-teachers/#:~:text=One%20reason%20to%20live%20at,retention%20rates%20amongst%20these%20teachers>.

⁵ Unpublished data from the Science Teaching Survey 2025 which asked questions of science teachers and technicians across the UK and Republic of Ireland in spring 2025. N = 72, (includes local authority schools and grammar school/selective schools).

⁶ The Science Teaching Survey 2024: <https://www.rsc.org/policy-evidence-campaigns/chemistry-education/education-reports-surveys-campaigns/the-science-teaching-survey/>

The Science Teaching Survey 2023: <https://www.rsc.org/policy-evidence-campaigns/chemistry-education/education-reports-surveys-campaigns/the-science-teaching-survey/2023/>

The Science Teaching Survey 2022: <https://www.rsc.org/policy-evidence-campaigns/chemistry-education/education-reports-surveys-campaigns/the-science-teaching-survey/2022/>

16. Teachers in rural and Welsh medium schools have told us that they are finding it especially hard to fill chemistry teacher vacancies. They often receive few or no applications for science teacher posts. A head of science in a Welsh medium school in West Wales likened the situation to “teacher Tetris across the Welsh medium schools”, where movement in one school creates a gap in another.

Factors affecting retention

Factors affecting retention in ITE:

17. The one-year PGCE is demanding, especially for those without strong subject backgrounds and even dedicated students struggle with the pace. The pressure of the course is a significant factor in dropouts and may deter potential applicants.
18. Some of the ITE tutors we spoke to said that post-COVID cohorts had weaker professional habits (e.g., punctuality, resilience), than their pre-COVID counterparts. They suggested that this might be attributed to their disrupted education and limited work experience. Similarly, practical skills of the post-COVID cohorts were reported as underdeveloped due to limited lab experience during their own education.

Factors affecting science teacher retention in secondary schools:

19. Good working conditions are key to retaining the existing teaching workforce in Wales. A significant factor in this is workload as teachers often cite an unsustainable workload as a key reason for leaving or wanting to leave their teaching roles. The Education Workforce Council's 2021 'National Education Workforce Survey', found that 70% of teachers felt that their workload was unmanageable.⁷
20. Evidence from the teacher surveying organisation, TeacherTapp 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 is making them consider leaving the profession.⁸
21. An experienced chemistry teacher we spoke to recently, when reflecting on poor student behaviour, said: “It is making me want to leave the profession”.

⁷ 2021 National Education Workforce Survey Report <https://www.ewc.wales/site/index.php/en/documents-eng/about/workforce-statistics/national-education-workforce-survey-1/451-national-education-workforce-survey-report-2021-1/file>

⁸ School Surveys, powered by Teacher Tapp, (2024, November). *Behaviour Barometer: Essential insights for leaders* <https://zhi5rt9t.sibpages.com/> or <https://schoolsweek.co.uk/whats-the-latest-on-behaviour-in-schools/>

22. 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 new science teachers have to cope with particularly high workloads.

Impact on learners

23. In our most recent Science Teaching Survey, 71% of respondents from mainstream state secondary school schools in Wales⁹ reported that learning was significantly impacted by understaffing of biology, chemistry and / or physic teachers.
24. High teacher workload is also having an effect on learners. 82% of science teachers in Wales who responded to our survey reported that a lack of non-contact time within the school day, for tasks such as planning, marking and practicing practical work, had a detrimental effect on student outcomes.¹⁰
25. Teachers have told us that the difficulties they've faced filling chemistry and other science teacher vacancies have led to non-specialists teaching science, including primary-trained teachers and teachers from other subjects, including maths and geography. Shortages can also result in schools relying on supply teachers, especially for key stage 3.
26. Relative differences in teacher shortages between the science disciplines inevitably affects how schools deploy their science teachers. There is a widespread practice of teachers being deployed outside of their 'specialist' science discipline in Wales. This can have a detrimental effect on students as the most effective teachers have deep subject and pedagogical content knowledge.¹¹ Moreover, passionate expert teachers of chemistry can influence students' decisions to continue their studies in the subject and pursue a STEM related career.

Impact on delivering educational reforms

27. Some of the teachers we spoke to reported that the pressures of high workload and challenging student behaviour left them with little capacity to plan effectively for the new curriculum.

⁹ Unpublished data from the Science Teaching Survey 2025 which asked questions of science teachers and technicians across the UK and Republic of Ireland in spring 2025. N = 51 (includes local authority schools and grammar school/selective schools).

¹⁰ The Science Teaching Survey 2024 <https://www.rsc.org/policy-evidence-campaigns/chemistry-education/education-reports-surveys-campaigns/the-science-teaching-survey/2024/top-issues-impacting-student-learning-outcomes/#wales>

¹¹ 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>

28. They also said that Additional Learning Needs provision is strained. One teacher told us that they and their colleagues feel 'overwhelmed' by the number of students needing support.

Impact on teachers and wider workforce

29. When a school is experiencing teacher shortages, it inevitably puts extra pressure on other staff who have to 'pick up the slack'. Teachers have told us that overtime this can lead to general low morale with staff feeling unsupported and overburdened.
30. Within the sciences, shortages often result in teachers having to teach outside of their specialist discipline which has the potential to increase workload if teachers must spend additional time developing their own understanding of a topic before teaching it.

Addressing recruitment and retention

Welsh Government should:

31. **Ensure financial incentives for ITE are comparable with England.** To encourage potential new teachers to train in Wales, ITE bursaries or other financial benefits need to be at least as attractive as those in England. Teachers often find their first jobs in their placement schools or near to where they train. This, along with the fact that the education systems in England and Wales are becoming increasingly distinct, means that people who move to England to complete their Initial Teacher Education may choose to stay there.
32. **Reduce teacher workload.** 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. Welsh Government needs to do more to enable schools to further reduce teachers' workload, including that associated with poor student behaviour. This will help to retain the existing workforce and by having more teachers who are satisfied in their jobs and advocate for teaching as a career, it will help to promote teaching as an attractive profession for potential new recruits (including the young people they teach).
33. **Invest in a systematic approach to subject-specific professional learning for teachers of the sciences** Teachers need access to quality assured professional development throughout their careers. They should be supported to develop and where appropriate, expand their subject and pedagogical content knowledge to ensure there are enough experts teaching the sciences and address the relative differences in shortages between the disciplines. 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 other school science disciplines.¹² Ongoing professional learning has also been shown to improve teacher retention.¹³

34. Urgently address the financial sustainability of higher education. It is well documented that universities in Wales are experiencing considerable financial challenges.¹⁴ To ensure a supply of suitably qualified teachers, chemistry undergraduate and PGCE programmes in Wales must remain viable.

35. Improve careers guidance about teaching. Research looking at young people's decisions about whether or not to go into teaching found that many more young people are open to teaching as a career than actually pursue it.¹⁵ Improved careers guidance in schools and universities should be part of the solution to improve recruitment into chemistry teaching. Guidance should portray science teaching as a valued and challenging science career and explain how to become a teacher in Wales.

¹² 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>

¹³ 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/>

¹⁴ BBC news article (May 2025) <https://www.bbc.co.uk/news/articles/c4geeygge3ro>

¹⁵ MacLeod, Emily; (2023) *The status and safety of teaching: A longitudinal study of why some young people in England become teachers, and why others do not*. Doctoral thesis (Ph.D), UCL (University College London). <https://discovery.ucl.ac.uk/id/eprint/10178871/>