Policy briefing

Tackling the challenges facing chemistry in UK higher education

September 2025

UK higher education is facing a financial sustainability crisis and is undergoing changes in response to this challenge, including department and course closures, and mergers. Chemistry higher education is central to achieving the UK Government's ambitions[1] and delivering the jobs growth potential of the chemical sciences sector, which is projected to outstrip the rest of the UK labour market by 30% by 2032[2].

RSC's Recommendations

We call on the Government to work in partnership with higher education and its stakeholders, including professional bodies, to:

1. Facilitate action to address the financial sustainability of teaching and research in higher education ensuring quality chemistry learning, research and innovation that meets economic, employer and student need across the UK.
2. Support the provision of high-quality chemistry education and training, including higher education, vocational and technical routes that are locally accessible for all.
3. Recognise the vital role chemistry higher education plays in delivering the innovations, skills and talent needed to deliver government priorities, including Industrial Strategy.
4. Address the cost-of-living pressures affecting students, reducing barriers to access, participation and continuation in chemistry.

Higher education's universities provide a major training pathway through chemistry degrees with sector employers and priority Government sectors (e.g. advanced manufacturing, clean energy and life sciences) dependent on the practical, digital and sustainability skills and knowledge that chemistry degrees provide[3]. Universities are also central to the UK's research and innovation ecosystem, delivering chemistry research that advances healthcare and drives sustainability approaches, whilst developing the researchers of the future.

Current financial pressures are forcing universities to take difficult decisions. Recent cuts and closures to chemistry provision, including University of Hull, Bangor University, and the University of Bradford, are already impacting local and national course availability. Decision-making at institutional level may not always account for the local, regional or national skills and research capability needs when closing or merging courses or departments. The financial crisis in higher education also exacerbates the financial pressures experienced by students, threatening the diversity of the chemical sciences and undermining the resilience and future of the UK workforce.

We are extremely concerned about the risk of universities closing chemistry programmes and departments that provide substantial long-term benefits to local and national economies. We recognise

the need for change in UK higher education to achieve financial sustainability and will work with Governments and other actors to shape this, whilst seeking to ensure the continued supply of the skills and capabilities needed for the future of the chemical sciences profession.

How to tackle the challenges

Recommendation 1: Facilitate action to address the financial sustainability of teaching and research in higher education ensuring quality chemistry learning, research and innovation that meets economic, employer and student need across the UK.

Maintain chemistry teaching's eligibility for support through the Strategic Priorities Grant and ensure this funding keeps pace with costs.

High-quality chemistry provision in higher education equips our future workforce with the skills needed to support growth across the economy[4], including in government priority sectors. Chemistry provision is dependent on the infrastructure, time and resources required to deliver high-quality practical skills development, skills that were seen as important or very important for student outcomes by students (98%) and employers (95%) during the RSC Accreditation Criteria review[5].

Chemistry provision is high cost and dependent on income from tuition fees and government grants, for example, through the Office for Students Strategic Priorities Grant (SPG) in England which provides funding for high-cost subjects and very high-cost STEM subjects[6]. Inflationary pressures and real-terms reductions to the SPG, which is estimated to have declined by 18.4% in real terms between 2018/19 and 2025/26[7] mean that the cost of delivering a chemistry degree now significantly outstrips the income received per student[8].

Universities across the UK are increasingly reliant on top-up sources of income to subsidise the costs of degree provision. Without alternative sources of revenue to address the shortfall, chemistry as a higher cost subject could face restricted student numbers, reduced quality of teaching, reduced access to provision, and mergers and closure of departments, as universities make difficult financial decisions.

We urge the Government to uprate the Strategic Priorities Grant to reflect the increasing costs of delivering a chemistry degree, to safeguard high-quality chemistry provision.

Continue support for curiosity-driven research in universities by sustaining quality-related research funding and improving cost recovery on project funded research.

Quality-related research (QR) funding, a critical flexible public funding stream for curiosity-driven research in the UK, has experienced a 15% drop in real terms in England with more significant drops in the devolved nations[9]. Pressures on QR funding, including increasing costs and poor cost recovery on project grants, reduce universities' ability to invest in new ideas, respond to emerging local and national priorities, and invest in talent development and infrastructure.

Research grant cost recovery for UK Research Innovation standard grants has dropped to 68.2%[10] significantly below the target of 80%[11]. As a result, universities must cross-subsidise research at a much higher level, placing pressure on already stretched income lines, including QR funding.

We urge UK and devolved governments to ensure that research and innovation funding settlements address and reverse the real-terms decline in QR funding and aim for a higher cost recovery of publicly funded research.

Building research and innovation capacity and creating impact: Examples of QR funding at Imperial College[12]

At Imperial College's Centre for Cryo Microscopy of Materials, QR funding enabled the Centre to purchase a Faraday Cage, to block electromagnetic fields from interfering with highly sensitive microscopy equipment. The Centre is a unique facility in the UK for the characterisation of environmentally sensitive materials and is funded by a £10.3m grant from the Engineering and Physical Sciences Research Council (EPSRC). Without the Faraday Cage, the Centre would not be able to fully operate.

Imperial College also uses QR funding to offer the Imperial College Research Fellowships. Dr Agi Brandt-Talbot, whose research focuses on the creation of low-cost renewable biochemicals and their recycling, was awarded the ICRF in 2017. The flexibility of the fellowship enabled Dr Brandt-Talbot to develop a new method for producing sustainable biochemicals and to co-found the company Lixea, which has since gone on to establish a pilot manufacturing plant using their patented method.

Recommendation 2: Support the provision of high-quality chemistry education and training including higher education, vocational and technical routes that are locally accessible for all.

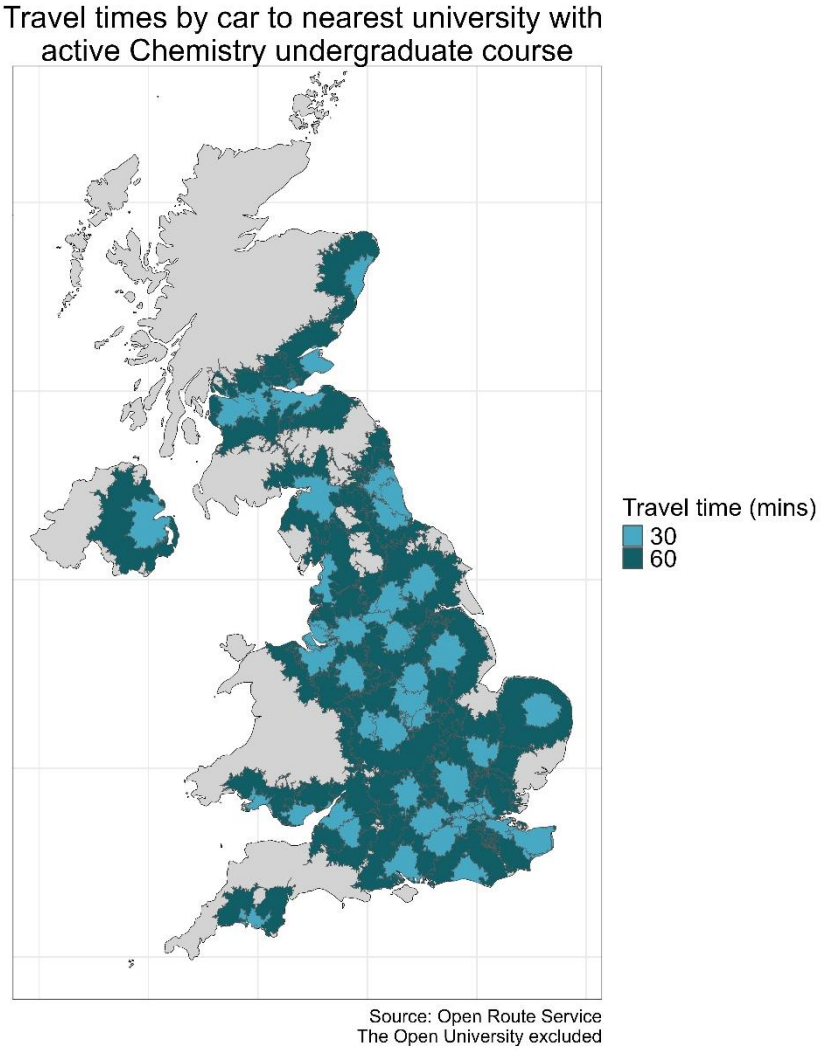
Ensure that chemistry higher education remains accessible across the UK to train our future chemical sciences workforce.

In recent years the financial pressure on universities has led to cuts and closures of chemistry courses and departments in the UK, resulting in "cold spots" where no provision of chemistry is available within a reasonable travel time[13]. Nearly half of UK undergraduates choose to study less than 55 miles from home and commute[14], with students from disadvantaged groups three times more likely to commute from home[15]. Cold spots limit student choice and access, and these limitations could result in lost progress towards improving the diversity of the chemical sciences.

Cold spots are emerging in East Yorkshire and the Humber with the closure of the University of Hull's chemistry department, and in North Wales with the closure of Bangor University's department (see Figure 1)[16]. Some of the institutions that have already announced cuts and closures to chemistry courses, or are believed to be at risk of doing so, have strong track records in supporting underrepresented groups to achieve degrees.

Decision-making at institutional level may not always be able to consider how local course closures or mergers will affect student access and skills provision across the UK. It is critical that the Government and higher education sector act to ensure that chemistry higher education providers remain available across the UK to train our future workforce, and chemistry research and innovation continues to benefit local economies. A strategic, UK-wide and long-term approach is needed.

Figure 1 – A map indicating the travel times by car to an active chemistry undergraduate course in the UK based on HESA data. 30- and 60-minute driving ranges are indicated in blue and green respectively. Grey indicates where the driving range is over one hour.



Expand and diversify the pathways into the chemical sciences workforce, such as vocational and technical routes, alongside academic routes.

To meet the demands of the growing chemical sciences sector and mitigate the acute shortage of technician-level skills[17], post-16 chemistry education must offer diverse pathways, including apprenticeships and technical qualifications, alongside academic routes. Currently, higher education provides the main route into the chemical sciences, with over 70% of the chemical sciences workforce possessing at least an undergraduate degree, compared to around 40% of the overall UK workforce[18].

Universities play a key role in widening participation, by offering degree apprenticeships and forming partnerships with other further and higher education providers. Through stronger collaboration in the tertiary education system and lifelong learning initiatives, universities have the potential to further broaden pathways into the chemical sciences, by removing barriers to progression and supporting lifelong skills development.

The RSC is increasing awareness of different routes into the chemical sciences, for example through *A Future in Chemistry*[19]. It is important that vocational and academic routes awarding qualifications at the same level are held in parity of esteem and this should be a focus for Skills England and devolved equivalents. Policy and effective public messaging could open the chemical sciences sector up to more people through a wider choice of routes.

Recommendation 3: Recognise the vital role chemistry higher education plays in delivering the innovations, skills and talent needed to achieve Industrial Strategy priorities.

Higher education plays a crucial role in delivering highly skilled chemical sciences professionals needed for economic growth.

Chemistry degree programmes provide employers of chemistry graduates in diverse sectors with a pipeline of highly and appropriately skilled employees. Lightcast analysis projects that the growth of chemical sciences jobs will be 30% faster than that of the overall UK labour market out to 2032[20]. This should create an additional 12,000 jobs in core chemistry roles and over 100,000 jobs in chemistry-centred industries, on top of existing roles. University capacity on chemistry courses will be crucial to realise the growth potential of the chemical sciences sector, which supports Industrial Strategy priorities in areas such as clean energy, life sciences and advanced manufacturing.

Chemistry departments also make a strong contribution to regional and local economies, through partnerships with local industry (e.g. collaborative R&D), through knowledge exchange, and by providing access to the infrastructure and facilities that are necessary for research, development and innovation. Moreover, our research into the future skills need within the discipline shows that science and industry are becoming more interdisciplinary[21], which we are also seeing reflected in universities. The closure of chemistry departments impacts other science and engineering departments, including medicine and dentistry, which need chemistry capability to continue providing excellent teaching and research.

It is vital to recognise the crucial role chemical scientists play across key sectors. A loss of chemistry skills and research will impact research and innovation across Industrial Strategy priority sectors.

From university research to industry: How O.C.O Technology is transforming UK waste management[22]

O.C.O Technology spun out from research conducted in the University of Greenwich on CO_2 mineralisation, and has transformed UK waste management by turning industrial waste into carbon-negative construction materials. The company has created employment opportunities and has generated £13 million in aggregate sales while saving £60 million in landfill tax, illustrating how science-led research and innovation can drive sustainable industrial development, reduce emissions, and support the UK's transition to a circular economy.

In 2023, O.C.O Technology opened its fourth UK facility in Norfolk, expanding its mineralisation efforts and circular economy practices, whilst providing high-quality green manufacturing jobs to the local area[23].

Building skills to drive innovation: Swansea University and SPTS Technologies[24]

Plasma technology research at Swansea University, which enables precise etching and deposition on silicon wafers, has supported SPTS Technologies in developing advanced processes for semiconductor and Micro-Electro-Mechanical Systems applications, leading to the commercialisation of novel products.

SPTS Technologies has hired Swansea graduates, upskilled staff through PhD programmes, and sponsored MSc and PhD students. Joint outreach initiatives have further strengthened the talent pipeline, with events like the SEMI Talent Forum attracting new applicants and supporting long-term growth in the UK semiconductor sector. This academic collaboration has driven company growth into new markets, including China and Malaysia, and has propelled significant strides in technological innovation.

From the lab to life-changing health benefits: UCL's role in developing a breakthrough narcolepsy treatment[25]

The drug pitolisant was discovered through research led by University College London, and has transformed treatment for narcolepsy and excessive daytime sleepiness. Following its 2016 launch in Europe and approval by the Food and Drug Administration in 2019, pitolisant has attracted significant private investment and has reshaped clinical guidelines. In the UK, the drug is widely approved by the NHS prescribing committees and is 42% more cost-effective than alternatives, and in the US, patients report life-changing improvements in alertness and quality of life. More than 150 life sciences professionals have been employed to support pitolisant's success, boosting employment internationally.

Ensure that UK chemistry higher education including research and innovation is able to attract and retain the best students and staff, supported by an effective immigration system and welcoming environment.

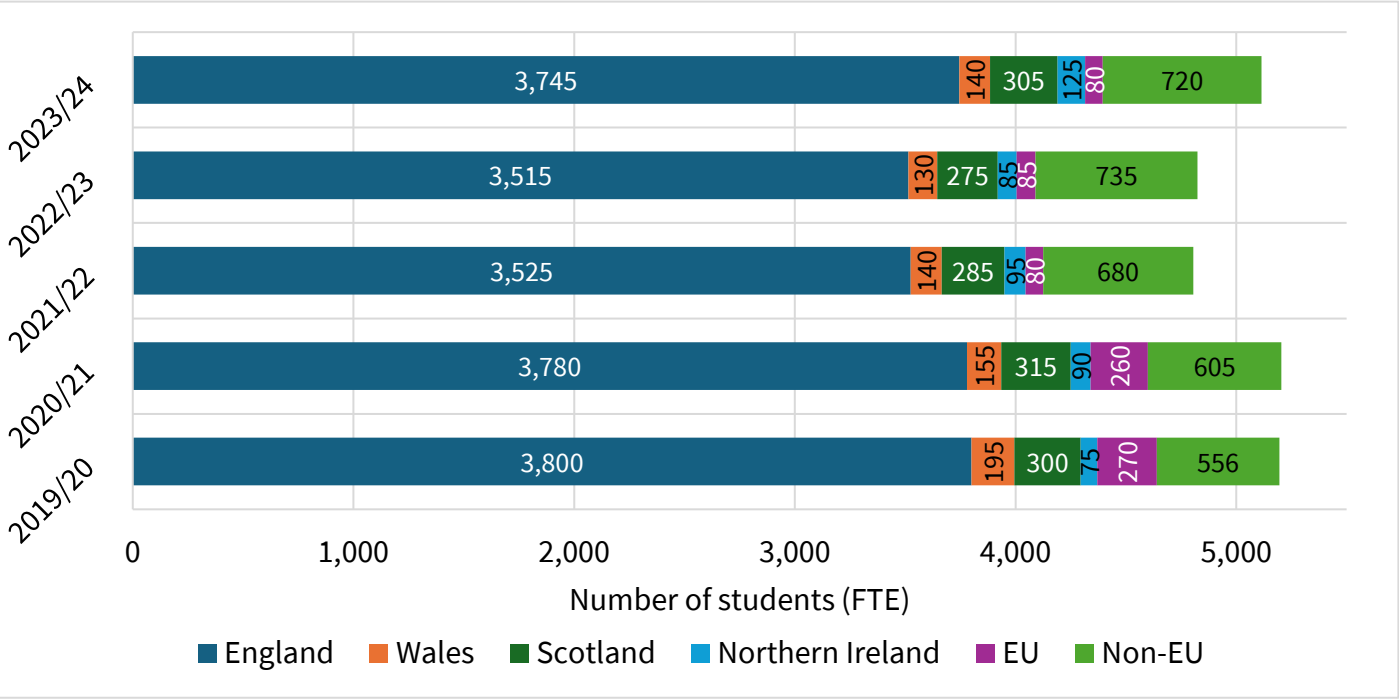
The UK is part of a global talent market for the advanced skills needed for chemical sciences research and innovation. Overseas students and staff contribute skills, expertise, cultural exchange, and links that can develop into collaboration and bring benefits for both partners, and this should be reflected in how we discuss this topic as a sector. Many universities also rely on the teaching of international students to cross-subsidise loss-making activities. In chemistry, the advertised annual fee for overseas students is around three times that for domestic students, sometimes more[26].

Recent changes in UK immigration policies and geopolitics, including stopping taught postgraduate students bringing dependents into the UK, and the proposed reduction in the duration of the Graduate visa, impact the attractiveness of the UK as a study destination.

While there was an overall rise in the number of students enrolling on a chemistry undergraduate course in 2023/24, international student numbers decreased (see Figure 2). Decreases in international student enrolments put pressure on a sector that is already struggling. Similarly, the proposed introduction of a levy on international student fees is causing significant concern in the sector and the consequent income reductions could push more universities into making further cuts.

Recognising the global nature of the chemical sciences, Government must develop an immigration system that works for the research and innovation sector, to attract and retain the best talent. Immigration policies must be internationally competitive and welcoming in tone and attitude, recognising the economic benefits of attracting international students, skilled workers and future entrepreneurs.

Figure 2 – Analysis of HESA data showing all chemistry first year undergraduate enrolments by domicile between 2019/20 and 2023/24[27].



Support a good science culture that enables researchers to reach their full potential, delivering high-quality science that benefits society.

A positive science culture creates an inclusive and thriving (chemical) science sector that attracts and retains the best talent. Our work with our community has identified key qualities of good science culture including rigor, safety, ethics, openness and inclusivity that support high-quality science[28]. To remove unnecessary barriers to entry into science and reinforce high standards of professional conduct, a shared responsibility among funders, employers, scientists, and innovators is needed.

Government, funders, and universities must ensure that good science culture is embedded in their approach to research and innovation as they respond to the financial sustainability challenges facing the higher education sector.

Recommendation 4: Address the cost-of-living pressures affecting students, reducing barriers to access, participation and continuation in chemistry.

Provide effective support for students facing cost-of-living pressures.

Maintenance support for students in England is estimated to cover half of the true costs[29] of studying at university. Cost-of-living pressures are increasing the rates of student hardship[30], with 68% of students now working during term-time[31], whilst hours worked have also increased[32]. As a high contact hour and practical subject, chemistry risks becoming less attractive to students balancing work and study.

The RSC's socioeconomic inclusion landscape analysis[33] demonstrates that individuals from low socioeconomic backgrounds are underrepresented and disproportionately experience barriers to progression within the chemical sciences. Financial barriers to participation and continuation in chemistry higher education risk impacting the diversity in the chemical sciences, undermining the resilience of the UK workforce, including in government priority sectors. It is therefore vital that approaches to student support address the challenges faced by students due to the rising cost of living.

Contact

The Royal Society of Chemistry would be happy to discuss any of the issues raised in our statement in more detail. Any questions should be directed to policy@rsc.org.

About Us

With around 60,000 members and a knowledge business that spans the globe, the Royal Society of Chemistry (RSC) is the UK's professional body for chemical scientists, supporting and representing our members and bringing together chemical scientists from all over the world. Our members include students and researchers in universities, teachers, regulators and those working in both large multinational companies and small and medium enterprises.

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