

External Examining in the Chemical Sciences

A Good Practice Guide



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Introduction

External examiners play an essential role in the UK higher education quality assurance and enhancement processes. They are viewed as a strength of UK universities, acting as independent moderators in checking and maintaining standards for taught programmes.

External examiners also play a crucial role in the Royal Society of Chemistry's accreditation of chemistry and chemical science degree programmes. Their annual reports and the responses from universities provide confidence to assessors that robust quality assurance processes are in place.

As the maintenance of degree standards has come under ever greater scrutiny, the role of external examiners has become even more important in ensuring comparability of degree standards, both between institutions and different generations of students. That role is essential in ensuring that the qualifications and classifications that students achieve continue to be valued and respected by employers. That requires that the role of external examiners should be clearly understood by students and other stakeholders across the entire sector, and that consistency will ensure both effectiveness and transparency and therefore ultimately confidence in the system.

The joint Quality Assurance Agency (QAA) and UK Standing Committee for Quality Assessment (UKSCQA) Revised UK Quality Code for Higher Education¹ requires that providers use external expertise to ensure that the academic standards of courses meet the requirements of the relevant national qualifications framework. The revised code is less prescriptive than

the previous QAA UK Quality Code for Higher Education, part B, Ensuring and Enhancing Academic Quality². Individual departments use external examiners differently and there is a wide variety of practice in this area.

This good practice guide to the appointment and role of external examiners for chemical science degrees is intended to help to ensure that those high standards are maintained. It reaffirms the fundamental purpose of external examiners, provides advice on the appointment of external examiners and gives clarity on the essential responsibilities as the role has evolved. It offers specific guidance for both institutions appointing and supporting their external examiners. It also offers support for external examiners themselves in carrying out their role.

¹ <https://www.qaa.ac.uk/quality-code>

² Quality Assurance Agency UK Quality Code for Higher Education, Part B, Ensuring and Enhancing Academic Quality, Chapter B7: External Examining (https://www.qaa.ac.uk/docs/qaa/quality-code/chapter-b7_-external-examining.pdf)

Role of External Examiners

External examiners act as external moderators. They are appointed to check the institution is maintaining the academic thresholds for the awards under consideration, ensuring that the academic standards meet those laid down by agencies such as QAA and professional bodies. In addition they also provide assurance that the assessment process is rigorous and fair and provide a check that the academic standards of the University's awards are comparable to other higher education institutions, providing a valuable measure of consistency. External examiners are simultaneously the maintainers of institutional academic standards, process checkers and the guardians of national standards. External examiners also play an important role as critical friends in quality enhancement, recognising and sharing good practice in learning, teaching and assessment.

The Changing Practice of External Examiners

Although the substantive purpose of external examiners has not changed, the way in which they carry out their role undoubtedly has. In the past, one of the most prominent responsibilities for external examiners in the chemical sciences was in making judgements on individual candidates at borderlines, often by conducting additional oral examinations. That practice has now all but stopped, not least because it favoured those students that performed well under the individual conditions of an oral examination, leading to concerns about academic standards, fairness, inclusivity and equality.

Instead, the emphasis for external examiners in chemical sciences is now rather more on ensuring that universities

have appropriate assessment regulations and practices in place, and in reviewing the setting and marking of assessment. If appropriate assessment processes are followed, and the standards of assessment are appropriate, then the final outcomes for students should be valid. Even for students with extenuating circumstances, the responsibility for exercising any individual judgement, where allowed for within the institution's regulations, should lie with the board of examiners and not only with the external examiners. It is of course important, even with this more algorithmic approach to classification and awards, that external examiners check that the final outcomes are appropriate and consistent with the expected standards across the sector, either by checking samples of student work such as summative coursework, examination scripts, dissertations and projects, or by meeting students. However, this is very different from being responsible for setting the borderlines themselves. Much of the most important work of external examiners therefore goes on during the academic year and not just at the end of the year. External examiners need to pay attention to standards across all years of degree programmes, and not just to the final year.

External examiners should be appointed with this change in practice in mind. It is now more important than ever that external examiners are expert in a wide variety of assessment practices and knowledgeable about not only academic standards, but also about educational innovation and good practice.

The Appointment of External Examiners

The process for the recruitment, selection and appointment of external examiners will vary according to the institution. However, there are some common principles.

How Many External Examiners?

It is essential that institutions appoint sufficient external examiners to cover the breadth and depth of the programmes offered. This entails, for the majority of undergraduate chemistry programmes, having at least three external examiners covering inorganic chemistry, organic chemistry and physical chemistry. This has been a notable strength of external examining in chemistry. Having three external examiners allows for a diversity of different backgrounds, experiences and expertise. It also allows for continuity and enables reference to previous issues or good practice even as external examiners rotate through appointments.

However, other models may also be valid. For undergraduate programmes with a certain specialism, such as analytical chemistry, it is essential that at least one external examiner has expertise in that particular area. They may either supplement or replace one of the three inorganic, organic or physical external examiners. They should take responsibility for oversight of particular units in the specialism and any specialist programmes, and contribute to the oversight of any general chemical science programmes.

Alternatively, institutions may appoint two external examiners, with one covering synthetic and the other non-synthetic chemistry. This will, however, make it more difficult to cover the full breadth of the discipline with sufficient expertise.

The same principles apply to general taught postgraduate chemical science programmes. Indeed, an institution may appoint the same three external examiners to cover both undergraduate and taught postgraduate programmes. In such a case, it is important that at least one of the examiners has particular expertise in stand-alone taught postgraduate programmes. For more specialist taught postgraduate programmes, it may be possible for only one external examiner to cover the full range of material.

Period of Appointment

External examiners should be appointed for a maximum of four years. Re-appointment should be avoided, and only considered where continuity is important, such as if another external examiner unexpectedly cannot continue, or where a programme is undergoing a period of change due to curriculum review.

Selection

Qualities, Skills and Experience

External examiners should be selected because of their specialist knowledge, skills and experience of taught higher education in general and quality assurance and enhancement processes in particular, rather than solely because of their research reputation or standing in the chemistry community.

An external examiner should show a strong commitment to education in general and quality assurance in particular that goes beyond the routine teaching responsibilities of an academic. That might typically involve having undertaken leadership roles in education either within their own department or university, or indeed

across the sector. Examples include, but are not restricted to, having acted as a programme director, head of learning and teaching or head of school, quality reviewer or critical friend, or assessor for Royal Society of Chemistry accreditation. External examiners should have an established national reputation within the discipline, but need not hold a professorial appointment.

The majority of external examiners will have followed a conventional academic pathway and be able to draw from their experience of both education and research. However, there is also considerable value in appointing an external examiner who is employed on an education and scholarship pathway. Both career paths contribute different strengths. Research-active academics will typically be able to bring their expertise in the latest innovations in the chemical sciences, whilst those on education and scholarship pathways may have more of an insight into the latest developments in pedagogic practice. Ideally, at any one time, the team would include external examiners with both types of expertise.

Diversity

In selecting external examiners, an institution should take into account and, as far as possible, ensure the diversity of the appointed external examiners. This should include, but not be restricted to, gender and ethnicity.

It is also good practice to ensure that external examiners are drawn from different types of institution. There is clearly merit in appointing an external examiner from a similar type of institution, who will therefore recognise common challenges and have some experience of possible solutions. However, there is also value in recruiting an external examiner from a completely different type of institution, because

of the fresh insight they will bring. Thus, a research-intensive university should consider appointing an external examiner from a post-92 institution, and vice versa. This will help to ensure that standards are consistent across the entire sector, and not just within subsets of similar types of institution. It should also assist in maintaining the reputation of the sector by refuting any suggestion that external examiners are not independent, but are instead appointed from a limited field of like-minded academics.

Avoiding Conflicts of Interest

In selecting external examiners, it is essential to avoid any actual or apparent conflict of interest or reciprocal arrangement. External examiners should therefore not be

- a recent employee or student of the university
- involved in a current or recent research collaboration or partnership agreement
- from the same institution as either an existing or recent external examiner for the same or related programme
- from an institution for which a colleague in the same department acts as an external examiner, so that there can be no suggestion of a reciprocal arrangement

Institutions should maintain a central register of appointments and periods of tenure for external examiners. It is good practice also to keep a parallel register of the institutions own staff that act as external examiners elsewhere. This will help in avoiding inadvertent conflicts.

Identifying External Examiners

Universities are encouraged to adopt a transparent approach to the appointment of external examiners, actively advertising vacancies and not only making appointments through direct nomination. This will help in ensuring that external examiners are drawn from the widest possible pool, promoting diversity and providing opportunities for candidates who have not previously acted as external examiners.

Carrying out the Role of External Examiner

Training and Support

Universities should ensure that external examiners are provided with appropriate training and support for the role. New, or inexperienced external examiners should be paired with a more experienced external examiner who can act as a mentor.

Ideally, external examiners should have engaged in specific training for the role, such as the Professional Development Course for External Examiners offered by Advance HE³. This should be a pre-requisite for appointment of an external examiner to their first post, although experienced external examiners will also benefit from such training.

Duties and Responsibilities

External examiners are responsible for maintaining standards across an entire programme. This may be achieved in a number of different ways. External examiners may work together and share responsibilities as a team. Instead, in addition to their particular responsibility for reviewing modules in their subject specialism, individual external examiners may be given responsibility for a certain year of study. In subsequent years, the external examiners may retain

responsibility for the same year of study, allowing them to reflect knowledgeably on student outcomes of the impact of any changes introduced. Alternatively, the external examiner may progress through the years of the programme with the student cohort, such that, on initial appointment, a new external examiner assumes responsibility for the first year of study, and in subsequent years the second, third and, where appropriate, fourth years of study as they become more experienced.

In doing so, most attention should be paid to the assessment that carries the highest weighting in determining a degree classification or award.

Assessment and Classification Processes

External examiners should assure themselves that assessment and classification processes are reliable, fair and transparent. For programmes in the chemical sciences, external examiners are required to familiarise themselves at the beginning of each academic year with

- the progression and award regulations
- the module and programme specifications
- the learning and teaching methods
- assessment methods, including processes for marking and moderation
- reports from other external examiners in previous years, along with the responses from the institution

for the modules and/or programmes for which they are formally responsible. This will often require that external examiners are given access to an institution's virtual learning environment.

³ <https://www.heacademy.ac.uk/training-events/professional-development/external-examining-course>

Setting of Assessment

It is a strength of the external examiner process in the chemical sciences that individual external examiners review and comment upon examination papers before they are set to ensure that they

- reflect the material covered in the module or programme, by reference to the unit or programme specification or to a detailed syllabus
- appropriately test the stated intended learning outcomes
- include an appropriate balance of tests of knowledge, critical analysis and problem solving skills for the level of study
- allow accurate and reliable discrimination between students across the full range of levels of achievement
- are at an appropriate level by comparison both with other modules or programmes at the same institution and by reference to national and international standards

In reviewing examination papers, external examiners should also ensure that

- the wording of rubrics and questions is clear and unambiguous
- questions are fair and can reasonably be completed within the time allocated
- are inclusive and can reasonably be attempted by all students registered
- questions are valid and chemically correct
- there is an appropriate mark scheme and marking criteria

Assessment in the chemical sciences can be very technical, including chemical and mathematical formulae, reaction

schemes and numerical or other data. It is therefore essential that institutions have appropriate mechanisms in place to ensure that even draft examination papers do not contain any typographical errors. It is not the responsibility of an external examiner to proof read examination papers.

Equally, it is not reasonable to expect external examiners to attempt individual examination papers, although some external examiners may choose to do so in order to satisfy themselves that the requirements above have been met. Instead, institutions should provide external examiners with either model answers or worked solutions. These should be specific to the particular question asked, and should not simply be copies of course materials.

External examiners should review not only the examinations set during the academic year, but also any papers to be sat at other times by students who may need to be reassessed or take deferred assessment. They should ensure that the assessments are comparable and of the same standard.

The same level of oversight should be provided to the setting of other forms of assessment that make a significant contribution to the outcomes for a student on a module or programme.

Sampling of Assessed Work

External examiners should review a sufficient large and diverse sample of assessed work to assure themselves that the marking and moderation is indeed appropriate and the outcomes of the assessment are consistent, meet the requirements of the national qualifications framework and are comparable with those of other institutions.

For modules and programmes in the chemical sciences this will typically include reviewing

- student examination scripts
- practical reports
- summatively assessed tutorial work
- reports from either study abroad or industrial placements
- oral and poster presentations
- oral examinations
- projects or dissertations

from years of study and not just from the final year of the programme, albeit with an emphasis on those assessments that make the most significant contribution to the final award.

Just as external examiners should review a sample of written student work to ensure that coursework, examination papers and project reports are properly marked, it is good practice that external examiners observe other forms of assessment, such as oral or poster presentations or oral examinations.

External examiners should not be involved in marking assessment. This would represent a clear conflict with their role as independent arbiters of standards.

Membership of Examination Boards

External examiners should be active members of all appropriate module, programme or award boards. Where it is not a requirement for a subject expert to be a member of an institution's award board, any preliminary observations of the external examiners should be available and taken into consideration when taking decisions on classifications or awards.

In all cases, decisions should be taken collectively, with internal and external examiners sharing that responsibility equally. Nevertheless, there may be occasions where the independence and demonstrable objectivity of an external examiner may be of particular value in reaching a decision.

Identifying Good Practice

In addition to their responsibility for quality assurance, external examiners also have a role in quality enhancement, through recognising and sharing good practice in learning, teaching and assessment. That responsibility should go beyond highlighting good practice to the university itself and the external examiner's home institution, but extend to dissemination as far as possible across the sector.

External examiners are encouraged to meet with students, separate from the observation of any assessment to learn about their experiences.

External Examiner's Report

Each year an external examiner should produce a formal report with clear and informative feedback that

- confirms that they had sufficient information and evidence to arrive at their conclusions
- whether any issues highlighted in previous external examiner reports have been considered to their satisfaction
- indicates whether or not the modules and programmes for which they are responsible meet sector-recognised standards
- gives recommendations for any changes to processes or practice
- highlights any good practice

Where external examiners have particular responsibility for specialist modules or programmes, they should address this explicitly in their report. Typically, this report will be submitted using a pre-prepared template and sent directly to the unit or division responsible for quality assurance within the university. Some of these functions may be satisfied by a checklist, although others will require more open-ended responses. The deadline for submission of the report should be set by the institution such that there is sufficient time to make any necessary changes ahead of the next academic cycle.

External examiners should raise serious concerns about any systemic failings with the head of the institution's degree-awarding body.

External examiners should avoid reference to individual members of staff or students. Where this is necessary, a separate, additional confidential report should be submitted to the head of the institution's degree awarding body.

Departments must respond to the external examiner's comments in a timely fashion, either indicating the actions they will take as a result of the report or detailing why they believe no action should be taken.

The individual external examiner reports and the institution's response should be made available in full to students. Such reports also provide invaluable evidence when considering the accreditation of programmes.

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