UNIVERSITY OF ABERDEEN

DEPARTMENT OF CHEMISTRY

INTERNAL TEACHING REVIEW

SUMMARY

Panel visits: Monday 26 April and Tuesday 27 April 2010
with an additional meeting on 13 May 2010

This summary is extracted from the full report on the internal teaching review of Chemistry following the review carried out in April 2010. It includes the Panel's overall impressions of the provision, a record of the Panel's commendations and recommendations, the Panel's conclusions and a list of the programmes which were revalidated.

Overall impressions

The Panel **commended** the friendly and supportive attitude of academic and non-academic staff towards students, a view confirmed by feedback from the students themselves. Staff were clearly very ready to engage with and assist undergraduates and postgraduates. They were passionate about and committed to their subject, and to making it accessible and interesting for students. Students understood and valued that, and were happy with the quality of teaching they received, the approachability and helpfulness of staff, and the degree programmes offered by the Department. The Panel **commended** the student placements undertaken as part of level 5 of the MChem degrees. There was strongly positive feedback about the placements from both students and staff. Staff took care to ensure that students on placement were well supported. It was obvious that there was a **commendable** degree of co-operation between all categories of Departmental staff and students. The range of degrees on offer was helpful in terms of recruitment. However, Chemistry agreed that it might be helpful to review the continuing usefulness of the 'Chemistry with' degrees. The Panel **recommended** that the Department do so. Experience had demonstrated to Chemistry that the range of specialist undergraduate degrees had helped recruitment. However, the Panel **recommended** that Chemistry review the specialist degrees to ensure that there was at least one distinct element in every year of the degrees to differentiate them fully from the BSc and MChem in Chemistry degrees. Panel members were concerned that academic staff carried high teaching loads and that there would be benefit in reducing the number of undergraduate degrees offered. It was **recommended** that the Department should review staffing loads, contact hours and the assessment load, the last of which impacted on both staff and students. It would be helpful if the Department were to consider the balance between teaching and other commitments. Chemistry had introduced a workload model for academic staff. The Panel had initial concerns about the transparency of the process but further discussions with the Head of Teaching had allayed those concerns. The Panel **commended** Chemistry for the introduction of the model and for devoting a staff meeting to discussing it. It was clear from the Department's submission, from a visit to the teaching laboratories by three Panel members and from discussions during the review that the teaching laboratories were in need of modernisation. While they were well managed, both the equipment and the furniture were in need of refurbishment or, ideally, replacement. It was noted that University plans to build new laboratories lay some years in the future and it was clear that there would be increasing constraints on university funding in the next years. However, given that Chemistry was an important subject within the range of BSc degrees and that there had been over 500 level 1 chemistry students in the first half-session of academic year 2009/10, it was important that suitable laboratory facilities were available. The Panel **recommended strongly** that the College seriously consider investing £50,000-£100,000 in medium and small items of equipment over the next five years. Such equipment could later be transferred to new laboratories as and when they became available. The suggested investment would help Chemistry introduce a **recommended** programme of obsolescence planning. The Department was **commended** for its strong engagement in schools outreach both as a means of supporting teaching in schools and as

a recruitment tool. It was an effective way in engaging both with teachers and with prospective students.

2 Commendable features

(Numbers in brackets refer to the relevant paragraph of the Panel's full report.)

The Panel **commended** the following aspects of Chemistry's provision.

Staffing

2.1 the introduction of a workload model to help in formalising workload allocation and devoting a staff meeting to discussion of it. The model was introduced in August 2009 and was not expected to be fully operational until academic year 2010/11. [3.1]

2.2 the contribution of support staff to the work of the Department. It was clear that both academic staff and students greatly appreciated the support offered by the technicians and secretarial staff who were strongly committed to supporting students. [3.3]

Course and programme design, accessibility and approval

2.3 the Integrated Chemistry course, CM4521, which included an oral exam on general chemistry. While it placed considerable demands on staff time, it demonstrated considerable commitment to the rigorous assessment of students(see 2.23 below). [5.5]

2.4 the way in which the Department had accommodated the requirements of students with special needs in a laboratory environment where the furniture had been installed many years previously and was not flexible for differing levels of physical ability. [5.5]

Teaching, learning and assessment

2.5 the small group tutorials that had been introduced at levels 1 and 2 for intending chemists (see also 2.18 and 2.24 below). [6.1]

2.6 the 'open door' policy' operated by the Department to encourage students to approach academic staff direct with any concerns they might have (see also 2.19 and 3.6 below). [6.2]

2.7 the use of guided group practicals at level 4 of the MChem degree. They encouraged students to develop the ability to work in groups and to take responsibility in co-operation with others. [6.5]

2.8 the placements undertaken from January to May during level 5 of the MChem degree programmes. It was clear that academic staff took care to prepare students for the placements and to support them during their time away from the University. Students clearly valued both the opportunity to go on placement and the support provided by staff (see also 2.22 below). [6.6]

2.9 the efforts made to enhance uniformity of assessment in continuous assessment modules and with projects. [6.7]

2.10 the considered use of different methods of assessment to ensure that students were not disadvantaged by over-reliance on a single mode of assessment. [6.7]

Course and programme monitoring and review

2.11 the course review meetings held shortly after examiners' meetings each summer. They were a timely mechanism for considering student achievement, student feedback and examiners' comments. [7.1]

Training and supervision of research students

2.12 the requirement that all research students submit progress reports after nine months and 21 months, and the subsequent examination of the students in *viva voce* style by two examiners. It was a means of identifying students who were experiencing difficulties, it provided the basis for intermediate exit points at MSc (research) or MPhil level if needed, and it gave students practice in *viva voce* examination before the final PhD oral. [9.2]

2.13 the training given to prospective demonstrators which had recently been enhanced. It was clear that the support given by demonstrators was valued. All Chemistry research students had to act as demonstrators for undergraduate laboratory classes during the first two years of research. [9.3]

Personal development and employability

2.14 the attention given to the inclusion of employability issues within course design at levels 3-5, an inclusion which predated curriculum reform. Students were encouraged to develop transferable employability skills and were conscious that their degree programmes gave them a good command of chemical techniques which would be of use in employment. [10.1]

Staff training and educational development

2.15 the formal mentoring scheme which had been put in place to support all probationary staff. It was clear that the scheme worked well and that the support given by colleagues was highly valued. [12.1]

2.16 the provision of laboratory training for post-doctoral fellows and the support fellows received from technicians. [12.2]

Student involvement in quality processes

2.17 good communication between students and Department committeees and from committees back to students. The Panel were encouraged to learn that there was little difficulty in obtaining nominations of students to stand as class representatives. [13.1]

Student support, retention and progression (part 1)

2.18 the small group tutorials at levels 1 and 2 for intending chemists. The intention was to improve pass rates but it was as yet too early to judge how successful the development would be (see also 2.5 above and 2.24 below) [15a.1]

2.19 the open door policy whereby students were actively encouraged to approach academic staff on a one-to-one basis to seek support when needed. Students were well aware of the staff's friendliness towards them and valued it (see also 2.6 above and 3.6 below). [15a.2]

2.20 the Departmental induction event for new students intending to take Chemistry degrees. It gave students the opportunity to meet staff in an informal setting at the start of their University studies. [15a.3]

Recruitment, access and widening participation

2.21 the Department's strong engagement in schools outreach both as a means of supporting teaching in schools and as a recruitment tool. It was an effective way in engaging both with teachers and with prospective students. [16.3]

Quality enhancement and good practice

2.22 the good practice shown in the MChem level 5 placement. The students were well prepared in advance and well supported during the placement. It was undoubtedly a valuable experience for them, both academic and professionally (see also 2.8 above). [19.1]

2.23 the Integrated Chemistry course, CM4521, which included an oral exam on general chemistry. While it placed considerable demands on staff time, it demonstrated considerable commitment to the rigorous assessment of students (see 2.3 above). [19.2]

2.24 the introduction of small group tutorials for intending chemists at levels 1 and 2 (see 2.5 and 2.18 above). [19.3]

3 Recommendations

The Panel invites Chemistry to consider the recommendations in this section and asks that the Heads of Teaching and Research, Chemistry, in consultation with the Head of School, the Head of College and, where appropriate, the College Director of Teaching and Learning, provide an agreed response to each.

The Panel **recommended** that Chemistry:

Staffing

3.1 review staffing loads to ensure that no member of staff carried a teaching load that might be detrimental to research activity. In undertaking such a review, it was suggested that it would be helpful also to review the assessment load associated with the Department's courses and programmes. [3.2]

The Departmental Teaching Committee have already started a review of overall assessment loadings together with the associated staff time related to essential feedback. There will always be a conflict between the need for a range of assessment methods and the need to release staff time for other activities but the review will ensure that where the time input for staff is high consideration is given as to how this might be reduced either by alternative methods of assessment or questioning the need for the assessment in general. This will always be done in the light of good practice policy such as the Enhancement Themes documentation. We will also ensure that where possible co-teaching with other degrees programmes is encouraged.

3.2 consider whether it would be helpful to take measures to encourage students to use the centralised office as a point of contact more than they seemed to do at present. While the change to a single, centralised School office had been beneficial in a number of ways, it had been less beneficial in others. [3.4]

The Department believes that the removal of the Departmental Office has been unhelpful in terms of enhancing the "Chemistry family" feeling amongst its students. This is particularly so at lower levels where intending Chemistry students spend a minority of their time on their intended degree subject, and the School Office has not succeeded in replacing the feeling of the centre of the Department which the old office fostered. However, we will attempt to further integrate with the School Office and use it where appropriate.

School organisation

3.3 consider whether Departmental Board business could be structured so that student representatives could participate in discussion of some agenda items, with sensitive issues being grouped for consideration in the later stages of the meeting after student members had withdrawn. [4.2]

The Department has considered the recommendation of the Panel but believe that there are sufficient routes to student involvement in Departmental affairs, such as the SSLCs (both undergraduate and postgraduate) together with the excellent amount of feedback we receive through "non-formal" routes, as recognised by the Panel. The Departmental Board is a general meeting covering all Departmental issues, many of which are sensitive and unsuitable for student input. Whilst it is acknowledged that the input of students in general is important in the running of the Department we feel it would be better to invite student representation when required rather than change the formal running of the meeting.

Course and programme design, accessibility and approval

3.4 undertake a review of the continuing availability of the 'Chemistry with' degrees. The range of degrees on offer was helpful in terms of recruitment and Chemistry had noted that students on the specialist degrees tended to switch to pure Chemistry at a later point in their studies. Panel members were concerned that academic staff carried high teaching loads and considered that there would be benefit in reducing the number of undergraduate degrees offered. [5.1]

The Department monitors the degrees of offer on a continual basis and will do so again this year. However, it should be noted that there are very few additional courses put on by the Department for the "Chemistry with" degrees. Most are structured by the inclusion of courses from other Schools and/or the inclusion of compulsory options at Higher levels together with a project in a specified area of Chemistry. Hence, the additional teaching load carried by the Department is minimal.

3.5 ensure that there was at least one distinct element in every year of each of the specialist degrees. [5.2]

This is a prerequisite of RSC accreditation and is already the case at levels 2 and above.

Teaching, learning and assessment

3.6 consider monitoring the effectiveness of the open door policy by evaluating whether students who perform poorly have previously sought advice from a member of academic staff. The Panel acknowledged the strong commitment demonstrated by academic staff towards their students (see also 2.6 and 2.19 above). [6.2]

We do not consider it practical to keep a formal record of all students who approach staff for assistance. However, course coordinators do tend to have a good idea of those who are "conspicuous by their absence".

3.7 re-examine the issue of pass rates which did not appear to have improved substantially across a five-year period. While a decrease in tariff scores on entry across the period could be a contributory factor, pass rates were questionable at all levels and it would be helpful to revisit the matter to ensure that underlying reasons were identified and remedies put in place. [6.4]

We are now half way through a process of re-examination of the components of the programme. This has been a rolling programme instigated by CREF and will finish in two years time. All courses are being closely examined in the light of many factors including their applicability to modern Chemistry,

students' abilities and recent pass rates. We will continue to do this and to take action where appropriate.

3.8 consider carefully whether the number of assessed elements in courses could be reduced. It should lessen pressure on students and help reduce the considerable teaching loads borne by several members of academic staff. [6.7]

A survey of assessed elements in each year group has recently commenced and the results will be considered critically in the light of the Panel's recommendations.

3.9 undertake a review of laboratory manuals. While their general usefulness and relevance was not in question, it seemed that, over time, a certain level of error had become apparent. [6.8]

This is acknowledged and was undertaken in time for the start of the 2010 – 11 session.

3.10 ensure consistent compliance with their policy that student demonstrators were never left alone in charge of a laboratory class even for short periods. In addition, Chemistry should ensure that all demonstrators were properly briefed before participating in classes to ensure that all demonstrators achieved the high standard that was the norm. It was clear that laboratory classes were generally very well run and that the input of demonstrators and technicians was greatly valued. [6.9]

It has been a long-standing policy that student demonstrators will at no time be left in charge of the lab. Staff have been reminded of their obligations in this respect and non-compliance will be viewed as a serious issue.

Training and supervision of research students

3.11 consider how they could help research students to complete and submit their theses within the normal timescale. While completion rates were generally good, there was a significant minority of students who took up to seven years to complete work on their theses. [9.4]

This is being considered at a College level by the Head of the Graduate School and the Postgraduate Committee. Recent changes in policy regarding the granting of extensions to writing up periods have also increased the likelihood of students completing their studies in the prescribed 4 year period.

Recruitment, access and widening participation

3.12 seriously consider recommending to the College of Physical Sciences that its 'going rates' for admission to undergraduate degrees in Chemistry be raised in order to make clear to prospective entrants the high quality of Chemistry teaching offered at Aberdeen. The Head of Chemistry (Teaching) confirmed that the issue was already being discussed within the Department. [16.1]

Admissions policy is governed institutionally, although subject specific changes can be made where appropriate. We will continue to ensure that Chemistry's needs are considered when admissions requirements are being set.

3.13 trim the number of 'Chemistry with' degrees in order to reduce the high teaching loads carried by a number of academic staff. [16.2]]

See response to 3.4

Matters to be taken up outside Chemistry

School of Natural and Computing Sciences

School organisation

3.14 The School had introduced a structure with a Head of Teaching and a Head of Research in each of the constituent departments. The Panel expressed a degree of concern about the division of management responsibility. The arrangement appeared to be working smoothly in practice, not least because of the positive attitudes of both Heads in Chemistry. The Panel **recommended** that, when the structure was reviewed as the SED indicated would happen, the School and Department put in place mechanisms to ensure that issues did not fall between the two areas of responsibility and that any conflict in priorities that might arise could be readily resolved. [4.1

It should be noted that following of review of the management structure of the School a decision has been made to abolish dual Headship system in place at the time of the review and revert back to that of a single Headship.

College of Physical Sciences

Impediments to quality enhancement

3.15 The Panel **recommended strongly** that the College of Physical Sciences seriously consider investing £50,000-£100,000 in medium and small items of equipment for the Department of Chemistry over the next five years. It was known that there would be increasing constraints on university funding in the next years. However, given that Chemistry was an important subject within the range of BSc degrees and that there had been over 500 level 1 chemistry students in the first half-session of academic year 2009/10, it was important that suitable laboratory facilities were available. A tour round the laboratories and discussion with members of the Department confirmed that, while the laboratories were well managed, both the equipment and the furniture were clearly in need of refurbishment or, ideally, replacement. Such equipment could later be transferred to new laboratories as and when they became available. The expenditure would improve the present infrastructure both for teaching and research and had the potential to improve recruitment. If funding for universities continued to be tight over the longer term and the building of new laboratories had to be deferred, the Panel **recommended** that the College seriously consider funding a more extensive refurbishment of the Chemistry teaching laboratories. [20.1]

Matters to be taken up outside the College of Physical Sciences

University

Professional units/bodies

3.16 The Panel noted that the Department's teaching was inevitably strongly influenced by the accreditation requirements of the Royal Society of Chemistry. The Department had responded positively to the institution-wide need to revise courses over a period of years to reflect the restructuring of degree programmes being introduced as part of curriculum reform. It was not yet clear whether the changes progressively introduced as a result of curriculum reform would be detrimental to the Department's prospects of reaccreditation. The Panel **recommended** that the wider University be receptive to Chemistry – and other departments and schools whose degrees were accredited by professional or statutory bodies – if the demands of curriculum reform were to give rise to difficulties in gaining accreditation or reaccreditation. [11.1]

Conclusions

Both staff and students in the Department of Chemistry showed a strong sense of identity and collegiality. Staff were clearly very strongly committed to encouraging and supporting students at all levels. Students valued the fact that staff were very approachable and helpful. While there were undoubted difficulties caused by the increasing age of laboratory furniture and equipment, both academic and technical staff actively worked to ensure that any impact on students' learning experience was minimised. Academic staff participated in a number of interesting and productive outreach activities to increase levels of interest in Chemistry among school teachers and their pupils. Such activities supported teachers in schools and was a useful recruitment tool.

The Panel wished to thank all members of staff within the Department of Chemistry for the work that had gone into producing the ITR documentation and for their participation in the review process. They also wanted to thank all students and members of staff whom they met during the review visit.

Revalidation of programmes

The following programmes were revalidated.

Undergraduate

Bachelor of Science (BSc)

BSc in Chemistry (04F10070)
BSc in Biomedical Materials Chemistry (04C72170)
BSc in Chemistry for the Offshore Industry (04F11170)
BSc in Chemistry with Education (Secondary) (04F1XC70)
BSc in Chemistry with Mathematics (04F1G170)
BSc in Chemistry with Management (04F1N170)
BSc in Chemistry with Physics (04F1F370)
BSc in Environmental Chemistry (04F14270)
BSc in Medicinal Chemistry (04F15070)

Master of Chemistry (MChem)

MChem (04F10527)
MChem for the Offshore Industry (04F11027)
MChem in Biomedical Materials Chemistry (04C72027)
MChem in Chemistry with Modern Languages (04F10827)
MChem in Environmental Chemistry (04F14327)
MChem in Medicinal Chemistry (04F15127)

Postgraduate tTaught

MSc in Chemical Sciences (57F1CSB1)

Postgraduate research

PhD in Chemistry (81F10PJ1)
PhD in Environmental Chemistry (81F14PJ1)