University of Aberdeen, Internal Teaching Review

**Department of Chemistry**

*Summary*

This document is extracted from the full report on the Internal Teaching Review of the Department of Chemistry conducted in March 2004. It includes the Panel's overall impressions of the provision and a record of the Panel's commendations and recommendations.

Overall Impressions

The Panel was impressed by the scope and overall quality of the Department of Chemistry's teaching provision. The Department has a strong record of updating its teaching to take account of changes in the academic infrastructure. Important revisions to core teaching in recent years have been made in response to changes in the school chemistry syllabus, the introduction of the Chemistry subject benchmark statement and the recommendations/requirements of the Royal Society of Chemistry (RSC). Positive reports from external examiners and accreditation in 2003 of the Master of Chemistry degree by the RSC confirm that the standard of the Department's teaching conforms to national expectations. For its size, the Department delivers a wide range of programmes that provide students with the opportunity to supplement core knowledge and skills Panel was also impressed by the Department's dedication to teaching lower level students who did not necessarily intend taking a degree in chemistry, commending its second, slower-paced introductory course and the provision of extra tutorials for less confident students. It was noted that the Department's efforts in this respect resulted in a net gain of students transferring to Chemistry from other subjects.

The Department has a noteworthy record of innovation in teaching and student support methods. In particular, the Panel considered that the Department's use of IT to aid self-directed learning and its arrangements for revision tutorials were exemplary. The students whom the Panel spoke to reported high levels of satisfaction with the quality of learning opportunities provided. The Department's commitment to quality enhancement was also evident from its positive attitude towards the review process, and the recent move to establish the post of Director of Teaching as part of the new Senior Management Committee.

The Department makes use of an imaginative and appropriately-targeted portfolio of teaching, learning and assessment methods, with a strong emphasis on the promotion of independent learning and acquisition of transferable skills. The comprehensive WebCT site for CM1010, CM1011 and CM1506 was firmly appreciated by Level 1 students, although those met by the Panel admitted that they did not always make the most of all of the features available. The 'Curly Arrows' interactive teaching aid, developed in the Department, is now used by other universities in the UK, Europe and North America. Students at Levels 3, 4 and 5 welcomed the skills training built into the *Communicating Chemistry* course and the *Project Planning and Management Exercise*, although it was felt that the value of both courses would be further strengthened by improved induction procedures. The Panel agreed with the Department that patchy delivery of in-course tutorials at Levels 3, 4 and 5 needed to be addressed, but it did regard the end-of-course revision sessions, highly praised by students, as an exemplary practice. The Panel was impressed by the Department's comprehensive documentation provided for students. There was evidence that students put this to good use when preparing for classes and revising. Students recognised that the work set for them became progressively more demanding as the level of study increased, and were happy that the format and content of exams matched this progression. However, the Panel found that the published marking criteria did little to support students' awareness of what was expected of them, and so recommended that the Department review its procedures here.

It is clear that the Department works hard to create a supportive learning environment. The Panel was most impressed by the Department's friendly atmosphere, which all staff and students rightly identified as a major asset. The sense of community is strong at all levels: first year students praised the help from demonstrators and teaching assistants in practical classes, whereas past and present PhD students spoke warmly of the interest taken in their work by supervisors and colleagues in the various research groups. The Department is also quick to adapt to the special needs of individual students.

The Panel approved of the Department's simple management structures. All staff interviewed believed that the Senior Management Group's weekly meetings, supplemented by full staff meetings on a monthly basis, was an effective combination that allowed all staff to contribute to discussion of teaching-related matters. However, the Panel was less clear on the relationships between Department, School and College management, although it did accept that it was too early to judge the impact of the new structures. At the time of review, important aspects of quality enhancement, including staff development and involvement with the SHEFC/QAA Quality Enhancement Themes, had not received attention from the Department or the School.

The class representatives were happy with the support provided by the Department and the conduct of Staff-Student Liaison Committee (SSLC) meetings. Important features included the use of e-mail communication and separate SSLCs for Levels 1 and 2 and Levels 3, 4 and 5. Despite these, and the commendably familial atmosphere of the Department, there was a sense that *formal* feedback to students from management was patchy. The Panel was of the opinion that the Department should revise its formal structures and procedures in this respect to make the most of its excellent staff-student relations, in particular drawing on the enthusiasm and perspicacity of its more experienced students.

The Panel agreed that several key areas of weakness were not within the immediate control of the Department. It supported the Department's view that scarce resources were a major limitation, recommending that these issues should be addressed in consultation with senior management at the School or College level. The Panel was particularly concerned about the old-fashioned laboratory space and equipment, and the impact of these on recruitment and students' research projects. Accordingly, it was interested to learn of the Head of School's plans to undertake a review of space within Meston Building, with a view to rationalising and modernising the existing facilities. It was also accepted that limited staff numbers accounted for sparse coverage of some important areas of chemistry. The Panel commended the efforts made by staff to sustain existing subject coverage, and the innovations introduced to uphold the quality of provision. However, the Panel did note that, in itself, any future increase in staff numbers did not guarantee improved teaching, nor did staff scarcity prevent enhancement of teaching quality, as, indeed, the Department's successful record of innovation and course development demonstrated.

**Commendable Features**

*Note: numbers in brackets indicate the relevant paragraph of the Panel's full Report.*

The Panel commended the following aspects of the Department's provision:

* the Department's achievement in securing accreditation of its Master of Chemistry programmes by the Royal Society of Chemistry (RSC) (1.2) and (5.2)
* the Department's efforts to ensure that the range of courses on offer was kept up-to-date and attractive to prospective students (1.4)
* the Department's commitment in teaching large numbers of lower level students who do not necessarily intend to take a degree in Chemistry (1.8)
* the Department's comprehensive statement of teaching aims and objectives (2.1)
* the efforts made by existing staff to sustain coverage of the subject at its current level, and the innovative methods used to facilitate this (3.4) and (20.4)
* the enthusiastic and supportive work of theDepartment'steaching fellows and demonstrators (3.5)
* the simple and popular organisational structure of the Department (4.1)
* the establishment as part of the Senior Management Group of the post of Director of Teaching, noting that Dr Masson had made an outstanding contribution to the development and enhancement of Chemistry's teaching(4.2)
* the conscientious efforts made by the Department to ensure that its curriculum takes account of wider developments (5.1)
* the Department's sympathetic and responsive attitude to students with disabilities and other special needs (5.4)
* the Department's commitment to teaching, and its determination to pursue enhancement opportunities despite alternative calls on staff time and scarcity of resources (6.1)
* the practice of using those staff with particular interests in teaching to deliver the Levels 1 and 2 courses (6.3)
* the innovative and effective use of C&IT, which the Panel regarded as being ***exemplary***praiseworthy features including:
* the new initiative to use personal response systems to enhance interaction in large lecture classes
* the 'Curly Arrows' integrative teaching aid for the depiction of chemical bonding and chemical reactivity
* the extensive WebCT site to support Level 1 teaching
* the use of computers to generate and mark practical assessments(6.4)
* the thoroughness of the Department's documentation, both on the Web and in hard copy (6.9)
* the academic progression built into programmes (6.10)
* the staff's ***exemplary*** practice of arranging end-of-course revision sessions, with the choice of topics mediated by the class representatives (6.12)
* the firm emphasis given to wider transferable skills (6.14)
* the Department’s framework of supervision and support for its research students (9.1)
* the wider research group structure and the attitude of the Postgraduate Research Coordinator (9.2)
* the close relationship between the Chemistry Department and the University Careers Service (10.1)
* the informative talk on the relative merits of the BSc vs. MChem degrees (10.2)
* the Department's enthusiastic support of the Royal Society of Chemistry (11.3)
* the Department's organisation of the class representative system (13.1)
* the system of student support at Levels 1 and 2 that is amongst the most comprehensive in the University (15.2)
* the web-based form for students to report medical absences (15.4)
* the strenuous efforts made by the Department to publicise chemistry in schools across Scotland (16.1)

**Recommendations**

*The Panel invites the Department to consider the following recommendations, and asks that the Head of Department and the Head of College, consulting with the Head of School and the College Director of Teaching and Learning as appropriate, provide an agreed response to each.*

The Panel recommended that the Department:

**Range of Provision**

* address problems of timetable clashes associated with the specialist Chemistry programmes (1.6)

*The issue concerning timetable clashes has been resolved for session 2004/05.*

* examine the articulation of these specialist programmes, aiming for a more 'joined-up', student-centred structure that ensured that 'specialist' Chemistry students are not disadvantaged relative to those students following the core Chemistry degree programmes (1.7)

The Department is currently reviewing the articulation of specialist programmes and will follow this up in the supplementary report due in one year.

**Staffing**

* discuss matters of staffing further with School and College management, so that future plans specifically take the Department's teaching into account (3.3)

The Department in its discussions with both School and College management makes every effort to ensure that teaching needs are considered along with research profile in making the case for new appointments.

It should be noted that two recent appointments have been made in Chemistry encompassing physical and medicinal chemistry. The School has also been successful in attracting an EPSRC advanced fellow who will contribute to higher level teaching in inorganic chemistry. These appointments partly redress the shortfall in expertise mentioned in 3.1.

* include in these discussions the contribution made by teaching fellows and postgraduate demonstrators so as to safeguard the practical support given to students (3.5)

The School has continued to provide funding for teaching fellows and postgraduate demonstrators and the Department will continue to emphasise the importance of these staff when bidding for additional teaching funds.

**School Organisation**

* keep the new management arrangements under review, to ensure in particular: i) that overlap between roles is avoided; ii) effective chains of communication are maintained between Department, School and College; and iii) that collective responsibility of staff within the Department is preserved (4.5)
1. The School is particularly anxious to avoid an overlap of roles and this formed the basis of a recent staff development training event. The Head of School and Head of Department have established an effective mechanism for the management of teaching.
2. *Effective communication within the College has been a concern but through a number of Executive-led initiatives including establishing a College Bulletin and associated website considerable progress has been made.*
3. *The collective responsibility of staff within Chemistry is preserved through its own management structure.*

**Course and Programme Design, Accessibility and Approval**

* incorporate a review of reasonable anticipatory adjustments for students with disabilities into the School's plans to re-develop the Meston Building laboratory facilities (5.4)

Accommodation of students with disabilities will be part of the planning for redevelopment of teaching laboratories.

**Teaching, Learning and Assessment**

* consider whether it was necessary to address problems of low student attendance at lectures and practicals (6.5)

The Department does not have a particular problem with low attendance at lectures. Attendance at practical classes is covered by existing arrangements.

* investigate the extent to which students struggled with calculations attached to the WebCT exercises, and consider taking steps to address this (6.6)

The Department will be offering voluntary tutorials during 2004-05 to help students struggling with WebCT at level 1.

* introduce a uniform system of in-course tutorials, and investigate a penalty/incentive scheme to encourage student attendance and preparation (6.11) ***(strongly recommended)***

For session 2004-05 compulsory tutorials will be built into the third year Chemistry timetable. These will run on a similar basis to second year tutorials i.e. compulsory attendance, problems set to be attempted in advance and peer marking during the tutorial.

* introduce a more formal programme of induction for group work and similar skills exercises, and encourage staff to attend relevant staff development events, or otherwise seek out examples of good practice (6.15)

From 2004-05, third year laboratory courses which contain elements of group work will include an induction to expectations and requirements for such activities. This will be done also for the PPME course which will be introduced to into fifth year in 2005-06.

*Staff are encouraged to attend and participate in development activities e.g. First Year Experience forum and the College Teaching Best Practice days.*

* take steps to remedy confusion as to which bits of C&IT work students following specialised Chemistry programmes are expected to take (6.16)

This has been done.

* review the timing of work submission deadlines (6.17)

This has been done.

* raise the need to obtain new laboratory equipment with School and College (6.18)

The Department has drawn to the attention of the College Director of Teaching & Learning the need (which is College-wide) for investment in teaching infrastructure. It is hoped that this issue may be addressed through the PRAM exercise, which is an internal review of the College spend on teaching.

* revise its assessment strategy and clarify its marking schemes (6.20)

The Department continues to review annually its assessment and marking schemes, striving for best practice at all levels.

**Academic Standards and the Academic Infrastructure**

* check its placement policies against the standards set down in the relevant sections of the QAA’s *Code of Practice* (8.4)

The Department will undertake this exercise.

**Training and Supervision of Research Students**

* consider measures to raise the profile of skills development within its general training arrangements for postgraduate students (9.3)
* consider the introduction of a specialist research methods course, recognising that this was an issue that should be addressed at the level of the College and/or the Academic Standards Committee (Postgraduate) (9.4)

In addressing both points, the Department is contributing, through its Postgraduate Co-ordinator, to discussions at College level about generic skills development and other training courses. The Department has reservations about the feasibility of a specialist research methods course.

**Staff Training and Educational Development**

* take steps to encourage staff to attend more staff development courses (12.2)

The Department will encourage staff to attend more staff development courses notwithstanding the increased teaching loads they are now being required to carry.

* review its in-house support for teaching fellows and postgraduate demonstrators, in the context of a wider College and University review (12.2)

# The Department is working to improve its in-house support for teaching fellows and postgraduate demonstrators.

**Student Involvement in Quality Processes**

* consider how best to boost awareness of the work of its SSLCs, perhaps by strengthening its *formal* feedback procedures (13.2)

The Department believes that students need to be more aware of the existence and role of SSLCs. It is hoped that departments across the College will actively engage in the process of raising student awareness and will work with the Student Association in achieving this..

* give some thought as to how best it can involve its students (especially its Honours and research students) with quality management and enhancement outwith the work of the SSLCs, taking into account the new SHEFC expectation that students should normally be represented on any committee that includes discussion of educational quality as part of its remit (13.3)

Discussions are in progress concerning student representation on the Departmental Committee.

**Recruitment, Access and Widening Participation**

* consider whether the returns on its various outreach events justified the efforts made (16.1)

The Department is reviewing its involvement in various outreach events, particularly in light of recent reductions in staff resources. The contribution of the Department to these external events is noted by the College and is highly commended for the level of engagement with the wider community.

**SHEFC Quality Enhancement Engagements**

* take steps to raise awareness of the quality enhancement engagements [action at the School and College level ***strongly recommended***] (17.1)

The Department would welcome a raised awareness of quality enhancement engagements at School and College level. It should be noted that the College Executive has agreed to fund one member of the College Teaching & Learning Committee to attend each of the quality enhancement events run in 2004-05 with a report being made to the following meeting of the Committee to ensure wider dissemination of information. Further College activities will be considered in the light of the reports received e.g. it has been agreed with ESDU that overview events will be organised throughout the year to allow as many staff as possible to benefit from the enhancement theme outcomes.

**Impediments to Quality Enhancement**

* address issues of limited resources in consultation with senior management at the School and College level (20.1)

The Department continues to raise the issue of limited resources for teaching with senior management. The review of space is ongoing within the College and although the existing infrastructure is not ideal, it is functional.

* raise the issue of laboratory manual costs with the School, with a view to identifying specific support for printing costs to be set against appropriate income from tuition fees or the SHEFC teaching grant (20.3)

The School will continue to support Chemistry in providing laboratory manuals to all students.