

University of Glasgow

Academic Standards Committee - Friday 9 October 2009

Departmental Programmes of Teaching, Learning and Assessment:
Report of the Review of Department of Chemistry held on 10 and 11
March 2009

Ms Fiona Dick, Clerk to the Review Panel

Review Panel:

Professor Steven Beaumont	Vice Principal (Research & Enterprise), Convener
Professor James Anderson	University of Aberdeen, External Subject Specialist
Professor Hamish McNab	University of Edinburgh, External Subject Specialist
Ms Ana Cohen	Students' Representative Council
Dr Rob Aitken	Biomedical and Life Sciences, Cognate member
Dr Martin Macauley	Senate Assessor on Court
Dr Vicky Gunn	Learning and Teaching Centre
Ms Fiona Dick	Senate Office, Clerk to Review Panel

1. Introduction

- 1.1 The Department of Chemistry is one of three Departments in the Faculty of Physical Sciences. The Department offers a broad range of programmes and a cutting edge research portfolio which attracts large numbers of undergraduate and research postgraduate students, involving collaborations with industry and research organisations in the UK and abroad. WestCHEM, a joint venture with the University of Strathclyde's Department of Pure and Applied Chemistry, was founded in 2005, and is a pioneering and internationally renowned research school which continues to enhance its position on the world stage following the highly encouraging outcome of the 2008 RAE (70% of the research activity in WestCHEM at 3* or above). WestCHEM is also part of ScotCHEM, a new collaborative venture between the major Schools of Chemistry in Scottish Universities
- 1.2 The Chemistry Department is located in the Joseph Black Building. Physical resources include two teaching rooms (a conference room and a tutorial room) four teaching laboratories, two Information Technology suites and a small library, which also houses eight computers.
- 1.3 The previous internal review (DPTLA) of the Department was undertaken in April 2003. It concluded that the provision was of a very high standard and identified a number of areas for development to further strengthen its provision.
- 1.4 The Self Evaluation Report was prepared by Professor Bob Hill (Head of Teaching), with input from Professor David Jackson, Head of Department; the Teaching Committee; other members of the academic staff and members of the Staff: Student

Liaison Committee (SSLC). The preparation process was supported by Dr Jane MacKenzie from the Learning and Teaching Centre and the draft Self Evaluation Report was discussed at a SSLC meeting in November 2008.

- 1.5 The Review Panel considered the Self Evaluation Report to be comprehensive and lucid but lacking in strategic direction. The Panel was disappointed that the Self Evaluation Report did not take a more reflective approach and include more on developments that had arisen as a result of the recommendations from the previous internal review in 2003.
- 1.6 The Review Panel met with the Dean of Physical Sciences, Professor John Chapman; the Head of Department, Professor David Jackson and the Head of Teaching, Professor Bob Hill. The Panel met with 14 members of staff, 1 probationary member of staff, 9 Graduate Teaching Assistants (GTAs) and 15 undergraduate students representing all levels of the Department's provision.

2. Background Information

- 2.1 The Department has a total of 57.8 FTE members of staff, of which 30.5 are academic staff and include: 11 Professors; 5 Readers; 7 Senior Lecturers; 5 Lecturers; 1 Senior Research Fellow; 1 Research Fellow; 2 University Teachers and a 1 Postdoctoral Research Associate.
- 2.2 Student numbers for Session 2008-09 are as follows:

Students	Headcount	FTE
Level 1	988	234.0
Level 2	281	134.8
Level 3	94	91.4
Work placement year	30	30.0
Level 4	69	65.5
Undergraduate Total	1956	555.8
Postgraduate Research*	91	91

*(for information only - research is not covered by the Review)

- 2.3 The Review Panel considered the following range of provision offered by the Department. (The degree programmes marked by an asterisk* are accredited by the Royal Society of Chemistry (RSC). The degree programmes characterised by a dagger[†] are recognised by the RSC.)

Master in Science (MSci) Honours degree:

- Chemistry with Work Placement*
- Chemistry with Forensic Studies with Work Placement
- Chemistry with European Placement*
- Chemistry with Medicinal Chemistry with Work Placement*
- Chemistry with Medicinal Chemistry with European Placement*
- Chemical Physics[†]
- Environmental Chemistry with Work Placement

Bachelor of Science (BSc) Honours degree:

- Chemistry[†]
- Chemistry with Forensic Studies
- Chemistry with Medicinal Chemistry[†]
- Chemical Physics[†]
- Environmental Chemistry[†]
- Environmental Biogeochemistry

BSc designated degree:

- Chemistry[†]
- Chemistry with Forensic Studies
- Chemistry with Medicinal Chemistry[†]
- Environmental Biogeochemistry
- Environmental Chemistry

2.4 The Department contributes to the following *joint* degree programmes offered with other departments or other institutions:

- BSc Designated Degree in Biology and Chemistry[†];
- MSci Honours in Chemistry and Mathematics;
- BSc Honours in Chemistry and Mathematics[†];
- BS. Designated Degree in Chemistry and Mathematics[†];
- BSc Honours in Environmental Chemistry and Geography[†];
- BSc Designated Degree in Geography, Chemistry and the Environment.

2.5 The Department also contributes to: MSc Environmental Science (administered by the University of Strathclyde) and MSc Chemical Engineering and Management (administered by the Faculty of Engineering); the first year courses Environmental Science and Science Fundamentals.

2.6 The Review Panel noted that most of the MSci Degree Programmes were accredited by the Royal Society of Chemistry (RSC) with the exception of the Chemistry with Forensic Studies with Work Placement, which was introduced after the last RSC accreditation but would be included in the next accreditation due later in 2009. Other degree programmes will be proposed to the RSC for recognition at this time. Accreditation of degree programmes allows a graduate to progress to the status of Chartered Chemist after appropriate experience without the need for a two-year professional development programme. Recognition of a degree by the RSC allows a graduate to progress to Member of the RSC.

3. Overall aims of the Department's provision and how it supports the University Strategic Plan

3.1 The Review Panel was satisfied that the aims of Department's provision, as detailed in the Self Evaluation Report, were appropriate and supported the University's Strategic Plan. In particular, the Panel considered that the Department's approach to enquiry-led learning and integration of research-led teaching within a friendly, supportive and inclusive learning environment with the aim 'to produce well-qualified graduates that are able to contribute to the chemical and other industries locally, nationally and internationally' was closely linked to the University's Learning and Teaching Strategy.

4. An Evaluation of the Student Learning Experience

4.1 Aims

4.1.1 The Review Panel was provided with details of the programme aims as part of the Self Evaluation Report and noted that all took account of the relevant benchmarks, the RSC accreditation review and the Scottish Credit and Qualifications Framework (SCQF). The Panel noted that courses were reviewed on a regular basis in response to: developments in the subject area; service teaching requirements of other Departments; requirements of external bodies (including RSC); views of potential employers; and feedback from students and external examiners. The Panel was concerned that in the course handbook for MSci students, it appeared that final year students were expected to do more work, rather than to be assessed at a different level. Linked to this was the issue of discriminating between the projects at final year for the two cohorts of students using a different marking pro forma, which should draw from the Masters level benchmark statements. The Panel considered that the programme aims could benefit from further clarification, and **recommends** that the Department revise the programme aims to further differentiate between the MSci. and BSc., by means of a clearer mapping of course workload to SCQF credits and levels.

4.2 Intended Learning Outcomes (ILOs)

4.2.1 The Review Panel noted that statements of Intended Learning Outcomes (ILOs) were provided to students as part of the course handbooks and programme specifications, and were satisfied that they were consistent with the Department's stated programme aims.

4.2.2 The Review Panel noted from the Self Evaluation Report, that examination questions were mapped to the specific ILOs being assessed and that the specific ILOs were detailed in the model answers sent to the external examiners.

4.2.3 The Review Panel noted the use of the outdated term 'objectives' instead of 'intended learning outcomes' in all but two of the course handbooks. The Panel **recommends** that the Department update the information on ILOs in the course handbooks in accordance with the Guidelines for Writing Aims and Intended Learning Outcomes at the Programme and Course Level, prepared by the Learning and Teaching Centre and available at: <http://senate.gla.ac.uk/academic/ilo/index.html>.

4.3 Assessment, Feedback and Achievement

Code of Assessment

4.3.1 The Review Panel noted, from the Self Evaluation Report, the Department's acknowledgement of the University's Code of Assessment but it sought clarification from the Head of Teaching about the Department's use of percentage marking. The Head of Teaching confirmed that assessments were criteria based but, as quantitative exercises, were scored more meaningfully in percentages in the first instance. These percentages, he reported, were then converted to grades and bands in accordance with the verbal descriptors in Schedule A of the Code.

Feedback to Students

4.3.2 The Self Evaluation Report raised the issue of the quality and promptness of feedback to students, and the Review Panel was interested to know how the

Department had responded to the students' less than positive experience, as highlighted in the National Student Survey (2007-08). It was reported by the Head of Teaching that the Department was currently in the process of reviewing assessment and feedback practices and was considering setting recommended times within which students should receive feedback on each type of assessment. The Panel was encouraged to learn that students could now access end-of-course examination scripts and that model answers for some of the tests and examinations were available on Moodle. This was confirmed during the meeting with undergraduate students. However, the students who met with the panel also reported a significant and progressive deterioration from Level 3 onwards, in the time taken to return assessments and the quality of individual feedback. The Panel raised this issue with the staff members it met, who conceded that there were challenges relating to the promptness and the level of detail of assessment feedback. They reported that the logistics of teaching increasingly large student numbers and the recent introduction of the new shorter academic year, had adversely affected their ability to support individual feedback. The Panel **recommends** that the Department continue its plan to review assessment feedback processes and to improve the timescales for and quality of the feedback provided to students. The Department should seek the support and guidance of the Learning and Teaching Centre at an early stage of its review.

New Structure of the Academic Year

- 4.3.3 In discussion, the Review Panel was informed by the Head of Teaching, that following the restructuring of the academic year, some lectures had been dropped and examinations had been scheduled closer to the end of teaching. This was explored with the undergraduate students who met with the Panel to ascertain the impact of the new structure on them. The students reported that the changes were only perceived as problematic by students who had experienced the previous system. Those affected reported that their preparation time for December class tests was limited and that they had preferred being able to use the vacation for study. They felt that this 'kept up the momentum' of study into the next semester. The Panel was concerned to learn from the Head of Teaching that there had been a slight decrease (3-4%) in examination performance, at levels 1 and 2, in comparison to previous years.
- 4.3.4 The staff who met with the Review Panel also reported a decrease of 1-2 aggregation points in class test performance for Level 3 Environmental Chemistry students. They expressed concern that the timetable compression had caused some students to disengage from teaching prematurely, in order to increase their study time. It was also noted that the Environmental Chemistry field trip had been withdrawn due to time pressures caused by the new academic year structure. The Head of Teaching reported that the Department was monitoring the impact of the new academic year to assess the total impact and that more effort would be employed to ensure students were given due notice of examination scheduling, to maximise the effectiveness of their study time. The Review Panel **recommends** that the University are cognisant of the department's ability to allow sufficient revision time before examinations when the new academic year structure is reviewed at the end of this session.

Laboratory Assessment

- 4.3.5 The demonstrators (equivalent to Graduate Teaching Assistants) who met with the Review Panel raised the issue of the relatively low contribution (10%) of laboratory work to the final mark in the assessment of Level 1 students. This was considered to be disproportionate to the student effort involved and demands on staff and equipment resources. The Panel noted that, in comparison, a major competitor's

laboratory work in the first year contributes 25% of the final grade. The Review Panel **recommends** that the Department survey the number of laboratory hours and the associated credit levels at a number of other Higher Education Institutions that offer Chemistry subjects and consider making adjustments to its provision where necessary to bring it into line with competitors.

4.4 Curriculum Design, Development and Content

- 4.4.1 The Self Evaluation Report described the Department's market analysis approach to the design and delivery of its courses, which was informed by internal (students, other Departments/Services) and external (employers, RSC, HEIs) feedback, and coordinated by course teams who report directly to the Departmental Teaching Committee. The Review Panel was impressed by the broad range and flexibility of programmes on offer, which support a wide range of student needs, including those with non-standard entrance qualifications. The Panel noted, however, that whilst students spoke highly of the Faculty entry system and the flexibility this afforded, it was notable that none mentioned the range of Honours courses on offer to be a Departmental strength. Given that this appears to absorb considerable academic resource, the Panel **recommends** the Department should consider carefully the cost/benefit trade off of such a wide range of programmes when reviewing its provision.

Science Fundamentals Courses

- 4.4.2 The Review Panel noted that the Science Fundamentals 1X and 1Y courses had been developed to meet the needs of students intending to study biological subjects, who had no formal qualifications in chemistry and were often also less qualified in terms of the required numeracy skills. These courses are cross-departmental provision and cover the subject areas of chemistry, mathematics/statistics and physics. The Panel **commends** The Department for the success of these courses in developing students' proficiency to an appropriate level for degree programmes in biological subjects.

Transferable skills

- 4.4.3 The Review Panel had been encouraged by the Department's transferable skills agenda, which appeared to be well-embedded in the curriculum and included numerous examples of innovative teaching methodologies. The Panel was therefore concerned to find that the undergraduate students whom it met considered that the Department's provision of generic skills was inconsistent and not appropriately developed across programmes or levels. In particular, students at Levels 3 to 5 did not feel adequately prepared for the different assessment tasks required (essay and report writing, using research resources and, oral presentations). The students considered that the Department could benefit from adopting good practice experienced in other parts of the Faculty (Environmental Chemistry, Physics and Geographical and Earth Sciences) regarding training in essay and report writing. The Review Panel **recommends** that the Department liaises with the Learning and Teaching Centre to identify good practice from other departments to improve the preparation it gives students for non-traditional assignments.

Employability

- 4.4.4 During the meeting with the undergraduate students, Level 3 students reported that careers advice provided during Level 2 was poorly coordinated and that the available interview slots were taken up by Medicinal Chemistry students. In addition, they would welcome more support for preparation for job applications, including

psychometric tests, interviews and application forms. The issue was taken up with Head of Teaching who confirmed that the Department was taking forward these issues with the Careers Service. The Review Panel **recommends** that the Department liaises with the Careers Service in respect of the coordination of career's advice to students and that the provision includes appropriate preparatory support for job applications.

Interactive Teaching Units

4.4.5 The Self Evaluation Report described Interactive Teaching Units, pioneered by the Department, as problem-solving group exercises worked from real life industrial/environmental cases, facilitated by staff mentors, and requiring a high level of student participation. The Review Panel was pleased to note from the Self Evaluation Report that the experience was rated very highly by students. This was confirmed at the meeting with undergraduate students, who reported that they particularly enjoyed the role-playing component. It was noted that the activity of developing the ITUs was part-funded by industry and that there were concerns regarding their continued support during the current economic downturn if more units are to be developed. However, the Review Panel **commends** this as an example of innovation and good practice which should be more widely disseminated.

Work Placements

4.4.6 All Level 4 MSci students undertake a one-year, credit-bearing, work placement in either a company within Europe or a university in France, Spain, Germany, Italy, Japan or Australia. The Department also encourages all undergraduates to undertake non-credit-bearing summer placements, which can take place between any years, either in companies within the UK or furth of the UK through the the International Association for the Exchange of Students for Technical Experience (IAESTE) work placement scheme. It was noted that the Department also offers summer research placements, within the Department. The Review Panel **commends** the variety of placement activities supported by the Department, which draw on the research strengths of the Department, enhance learning, employability and enrich the student learning environment.

4.5 Student Recruitment

Undergraduate students

4.5.1 It was noted from the Self Evaluation Report that there had been a steady increase in the quality and number of students over the last three years and that the Department planned to further increasing recruitment, specifically to core chemistry, despite a current shortage of laboratory accommodation. The Dean confirmed that the Faculty of Physical Sciences had experienced the greatest increase in student numbers of any Faculty across the University. The Dean advised the Review Panel that the Department was undergoing a two year refurbishment programme, which had gone some way to meet the accommodation needs but that the issue of equipment resourcing was ongoing. Future growth would be dependant on significant investment. Nonetheless, despite concerns regarding funding the Department planned to maintain its drive to attract higher quality students, although growth might be slower than it desired .

Faster Route Degrees

4.5.2 The Review Panel considered a recent Faculty initiative for Faster Route Degrees in Science, which it was hoped would attract more quality applicants from the UK and

abroad. The faster route involves direct entry to Level 2 for highly qualified students that wish to focus on a chosen area of study and reduce the normal timeframe. It was noted that the Department would need to consider carefully how best to support the individual needs of this student cohort, particularly for overseas students, both in terms of the inherent academic challenges and the social embedding required for their successful integration to Level 2.

Postgraduate Provision

4.5.3 It was noted from the Self Evaluation Report that the Department attracted a relatively large number of Postgraduate Research students (91) but that the Department did not currently offer Postgraduate Taught (PGT) programmes. The Head of Department pointed out that the Department had previously offered PGT courses, which were aimed at the local market but that numbers had decreased significantly as the market became saturated with competition from other Higher Education Institutions. However, the Department was now confident that the significant improvement in the Department's performance rating in the recent RAE (2008) would effectively open up international markets and, as a result, it was now outlining plans to offer PGT programmes from 2010-11.

Internationalisation

4.5.4 It was noted from the Self Evaluation Report that the Faculty was currently investigating alternative strategies to increase international recruitment. The Review Panel was informed of a range of activities with this aim which included advertising, coordinated campaigns with the other science and the engineering faculties and , ongoing negotiations with American recruitment contacts to develop links with a consortium of American colleges and staff visits abroad (China, France, Germany). The Panel noted that the Department was pursuing funding for a Teaching Fellow, whose remit would include support for and coordination of departmental recruitment opportunities/activities. However, the Panel was not satisfied that staff members were appropriately aware of the wider demographic issues facing the West of Scotland. The Panel was also concerned that international recruitment was being resourced at Faculty level and was considered a lower priority by some members of staff who met with the Panel. This was explored further with the Dean who confirmed that both the Department and the Faculty were taking action in a number of ways to ensure that future international recruitment was coordinated and effective. The Review Panel recognised that steps had been taken to increase international recruitment but considered that more extensive engagement was required on the part of staff members. The Panel **recommends** that the Department consider how it might raise awareness amongst staff, in terms of foreseeable trends in the external environment for recruitment.

4.6 Student Progression, Retention and Support

Progression

4.6.1 The Review Panel explored with the staff members whom it met the issue of progression from Levels 1 to 2. The staff suggested that the poor progression rates were symptomatic of the large numbers of student who intended to complete Honours in other sciences and, therefore, were less committed to the subject. These large numbers also impacted negatively on staff workload. The Panel considered a summary of staff workload profiles, which had been provided in advance of the meeting, but found nothing atypical apart from a slight skew due to project supervision. The Panel acknowledged that with such large numbers there was a significant administrative burden but it **recommends** the Department should continue

to review its strategies for enhancing progression through the levels, to deliver streamlined courses in a coherent way, with guidance from Academic Development Unit of the Learning and Teaching Centre and cognisance of other HEI's approaches.

- 4.6.2 It was noted from the review documentation that Level 2 pass rates were 10-15% lower than the Faculty average and the Review Panel was interested to clarify to what extent students were prepared, appropriately tested and/or supported by the Department in advance of examinations. Key staff members suggested that the entry criteria for Level 2 were possibly not robust enough and possibly linked with poorer lecture attendance but that the Department made considerable effort to identify students at risk and to support them via their Adviser of Studies.

Retention

- 4.6.3 It was noted from the Self Evaluation Report that the Department contributes to high rates of retention, as published at Faculty level, and that student progression rates had steadily increased during the past few years. The Head of Teaching informed the Review Panel that higher numbers of students than originally indicated by UCAS applications continued with Chemistry and that the Level 1 courses had completion rates in excess of 90%. He also confirmed that the Department took a proactive approach to identify and support students at risk, and to encourage them to seek advice from staff and Effective Learning Advisers. Attendance was monitored centrally by the Science Faculties Early Warning System and recorded student absences were followed up with 'encouraging communications'.

Support

- 4.6.4 In response to a statement made in the Self Evaluation Report, the Review Panel sought clarification of the point at which students in the Faculty of Science, identified through the UCAS process, and then by interview with a Senior Adviser of Studies, were allocated to an Adviser of Studies in the subject area finally elected. The Head of Teaching confirmed that all intending Chemistry students, and those transferring to Chemistry post Level 2, were allocated an Adviser of Studies from within the Department, and that meetings with students were held on a regular basis, at least three times a year. It was noted that feedback from the Minutes of the SSLC suggested that students were happy with pastoral care provision. This was explored further with the undergraduate students who met with the Panel. They described the provision as supportive and reactive to their needs, which ranged from 'an open door policy' to 'email contact only'. Some students felt that more information could be provided regarding degree option choices but on the whole got help if they needed it.
- 4.6.5 It was noted from the Self Evaluation Report that all undergraduate students were encouraged to seek summer placements and that language and other training and support were readily available. Students who met with the Review Panel reported that, in general, the Department provided very good support but felt that the preparatory process would benefit from the provision of more detailed information on living conditions and cultural aspects and it was suggested that previous placement students could usefully disseminate their experiences. The Panel was satisfied that the level of support provided by the Department was appropriate and encouraged the continued development of training and support for work placements.
- 4.6.6 It was reported that the Department liaised with the Student Disability Service to identify students with disabilities who are then interviewed by a Senior Adviser of Studies to clarify specific needs in advance of the start of their studies. It was noted from the Self Evaluation Report that the Department was able to meet a wide range of educational needs and/or disabilities, which had included modifications to equipment and fume cupboards. In discussion with the demonstrators, the Review

Panel was encouraged to learn that such students would be identified by course coordinator and assigned to a demonstrator on a one-to-one basis. It was agreed that, in general, the Department provided good support to students with special needs.

4.7 The Quality of Learning Opportunities

Laboratory Experience

4.7.1 It was noted that students spend a considerable amount of time in laboratories and, therefore, that it was important that this experience was stimulating, enjoyable and an effective learning experience. Students who met with the Review Panel raised issues relating to limited laboratory space and a shortage of equipment (particularly glassware). This issue was further explored with key staff who acknowledged that there were problems relating to large and increasing student numbers competing for teaching space, fume cupboards and basic equipment which were limited by finite resources. The Head of Department also raised concerns about this issue. It was reported that, despite a recent upgrade of the Level 3 laboratory and a £300k investment on large-scale equipment, students were still working in pairs/teams, with the exception of students doing their final year project; on work placements and working on a few experiments which were done individually. Demonstrators who met with the Panel expressed the view that some students relied too much on their partners, resulting in an uneven division of effort depending on individual levels of confidence. However, although staff and students acknowledged the benefits of working in pairs/groups, in terms of safety; mutual support and team working, the laboratory experience was regarded by all as an essential opportunity to acquire and develop the skills of individual working. It was noted that experimental design flow would be a factor in the consideration of suitability for individual working. It was also suggested that the laboratory subjects could be mapped across range of research areas for final year projects, tailored to future career path and aligned with industry requirements. It was noted that the Department was investigating the viability of setting up pre-laboratory video demonstrations on Moodle to make the learning experience more effective. The Panel **recommends** that the Department develops a plan to deliver learning opportunities for students to work on experiments individually as well as in pairs/groups. The resource implications for individual laboratory experiences are further considered in paragraph 4.8.10.

Moodle

4.7.2 The Self Evaluation Report noted that students enjoyed using the Moodle Virtual Learning Environment and made use of the information available. The Department also encouraged students to use an interactive website associated with the recommended Chemistry 1 textbook. The Panel was also pleased to learn that two final year students are developing interactive chemistry exercises within Moodle. Undergraduate students told the Review Panel that the information available for Levels 1 and 2 was good but was more limited for levels 3, 4 and 5. The Panel would encourage the Department to progress its plans to develop the use of Moodle, especially for the higher Levels.

Teaching Committee

4.7.3 The Panel was informed at the final meeting with the Dean and Head of Department that the Teaching Committee was currently undergoing restructuring with a view to enabling it to oversee teaching more effectively. It was noted that the restructured committee would address: laboratory issues; review tutorials (especially Level 3 and above) and conduct a review of curricula which would coordinate feedback

mechanisms from staff, Year Heads and SSLCs. The Panel **recommends** that the Department clarify the remit of the Teaching Committee to include: the development and implementation of a Teaching Development Strategy for the next 5 years; reviews of the curricula and sustainability of courses; progression issues; the development of PGT courses; and consideration of the effectiveness and attractiveness of the full range of programmes on offer. Any curriculum review should be conducted with reference to guidance and advice from University Services, such as the Learning and Teaching Centre and the Equality and Diversity Unit.

4.8 Resources for Learning and Teaching

Departmental Management

- 4.8.1 The Review Panel noted from discussions with the Head of Department and staff members, that formal communication structures did not seem to be operating effectively and that there was limited awareness of the potential impact of issues from within the University and externally, in terms of the broader environmental factors. The Panel was also concerned by an apparent lack of evidence of the strategic and development process operating within Department. The Review Panel **recommends** that the Department develops a strategic plan which clearly articulates key strengths within the wider environmental context (competitors, industry/economy, perceived demand) and how this would impact on future investment/direction in the teaching, learning and assessment of Chemistry. The Panel attached considerable importance to this recommendation and wishes it to be addressed forthwith, as many of the following recommendations depend upon it.
- 4.8.2 The Review Panel noted that the majority of courses had relatively low student numbers and wished to ascertain whether the Department considered this an efficient use of resources and discuss how this impacted on the staff workload, specifically in terms of teaching, assessment and administration. The Head of Teaching explained that the wide range of courses on offer was a response to the need for subject specialisation from Level 4 and perceived demand in a competitive marketplace. He confirmed that student numbers for these specialised courses was typically 7 or 8 students, with no minimum number required. However, he also stated that the provision of teaching and assessment was core and centralised, albeit with an administrative load in respect of timetabling and examinations.
- 4.8.3 With a significant number of retirements forthcoming over the next six years, the Review Panel was interested to know how the Department intended to manage the workload allocations of academic and technical staff. The Head of Department confirmed that three members of academic staff would be retiring in the same year from Environmental Chemistry but that this was not as significant as it might first appear because the degree programme was being phased out, although the subject would continue to be offered as a course. The Head of Department also confirmed that two modern apprentices had been recruited and would be in place to provide technical cover for laboratories. It was noted that the Department was currently reviewing its staffing structure and staff members who met with the Panel stated that they had already met with the Head of Department and Head of Teaching to consider how workloads would be redistributed to ensure effective future teaching provision. It was noted that the Head of Teaching's relatively heavy workload might undermine his ability to plan and manage staff succession and the Panel **recommends** that the Department clarifies the role of the Head of Teaching to ensure an appropriate remit.
- 4.8.4 The students who met with the Review Panel reported a serious concern in relation to teaching quality, which in their view had not been resolved. The Panel explored

with the Head of Department how negative student feedback in relation to the quality of teaching was dealt with. The Head of Department acknowledged that dealing with performance matters was difficult but assured Panel members that the matter was being addressed. The Panel **recommends** that the Department consult with the Academic Development Unit of the Learning and Teaching Centre and Human Resources to determine the appropriate course of action to address any issue of poor teaching.

- 4.8.5 It was noted from the Self Evaluation Report that, due to a combination of factors, secretarial recruitment had been protracted and had resulted in the absence of effective teaching secretarial cover during 2007-08. The Head of Teaching confirmed that the existing staff had collaborated effectively to ensure the processing and collation of the June 2008 examinations and results were completed.

Demonstrators (equivalent to Graduate Teaching Assistants)

- 4.8.6 The Review Panel discussed with a group of demonstrators the level of support that they had received from the Department. They reported that the Head of Teaching, Heads of Laboratories and other staff were approachable and reactive. However, they suggested that support could be more consistent in terms of level of staff support, particularly at the session start when students needed to acclimatise to the laboratory environment.
- 4.8.7 The demonstrators reported that the retirement of laboratory technical staff last session had resulted in an increased workload for the demonstrators. The Panel noted that the Department was confident that plans were in place for the effective succession management of technical staff and was confident that this issue was being addressed (see Paragraph 4.8.4).
- 4.8.8 The Review Panel noted from the Self Evaluation Report that postgraduate research students demonstrated in laboratories, assisted at Level 1 workshop sessions and Level 3 Frontiers courses and that a new laboratory specific training programme had been introduced this session, during which academic staff assessed the demonstrators' performance. Demonstrators who met with the Review Panel confirmed that they had found this training beneficial and complimented the generic graduate teaching assistant (GTA) training provided by the Learning and Teaching Centre. However, the Panel was concerned to hear that demonstrators were not familiar with the location and use of fire fighting equipment. The Head of Department reassured the Panel that a group had been set up to review the effectiveness of the demonstrator training. The Panel **recommends** that the Department liaise with Learning and Teaching Centre in its review of demonstrator training, which should include appropriate health and safety training.

Probationary Staff

- 4.8.9 Two members of the Review Panel met with the Department's probationary member of staff, who was in their second year of probation. Participation in the New Lecturer and Teacher Programme (NLTP) was reported to have been a positive experience, a useful source for new teaching materials and had been an invaluable networking opportunity to meet with other probationary members of staff. It was also reported that most colleagues had been very friendly and supportive. However, it was noted: that poor student pass rates and staff and equipment shortages placed considerable additional demands on their time; they had only very recently been assigned a mentor; whom they had not yet met with and that were also not aware of the availability of probationary guidelines within the Department. The Panel had some concerns that the teaching workload was beyond that which would normally be expected of a probationary member of staff and **recommends** that the Department

review its support of probationary members of staff to ensure that they are allocated appropriate workloads, which take cognisance of the demands of the NLTP. The Department should also ensure that the mentoring arrangement is in place and effective over the entire probationary period and that clearly articulated guidelines for probationary staff are developed which would usefully include key contacts.

Course Handbooks

4.8.10 The Self Evaluation Report had claimed that course handbooks included details of the formative and summative assessments for each course but it was noted that some handbooks only referred to the different methods and did not specify the contribution of each element to the final mark. This issue was explored during the meeting with students, who reported that some course handbooks contained inaccurate and inconsistent statements which were confusing and, as a result, the handbooks were not widely referenced. The matter was also taken up with key staff members who acknowledged that there were inconsistencies between course handbooks and that they were not being routinely updated. It was noted that course handbooks form an important part of the assessment conducted by the RSC, as part of the accreditation procedure and the Head of Teaching assured the Panel that the Department would be reviewing course handbooks as a matter of priority. The Review Panel **recommends** that course handbooks clearly articulate the relationship between effort and credit. The associated issue of adherence to the guidelines on writing aims and intended learning outcomes is discussed above at paragraph 4.2.3.

Annual Monitoring

4.8.11 The Review Panel considered the Annual Monitoring Reports (AMRs) and was disappointed to find them incomplete and inconsistent, both in terms of level of detail and reflection. It was noted from the previous review in 2003 that there had been a recommendation specifically addressing the quality of AMRs and the Panel was concerned that this remained unresolved. Furthermore, the Panel was concerned by statements from members of staff that they considered the AMR templates to be negatively framed and that the reproduction of statistics required to complete the reports was a duplication of effort and an ineffective use of their time. This view was explored with the Head of Department who acknowledged that some AMRs had not been completed but considered that they were part of an essential process to enhance provision. It was noted that the Department was currently reviewing its AMR process and with the recent appointment of a Quality Assurance Officer was confident of a more systematic approach by staff across all levels. The Panel **recommends** that the Department continues to review its AMR process, in compliance with University Quality Assurance process and drew its attention to the Code of Practice in Annual Monitoring available at: <http://senate.gla.ac.uk/qa/acmr/amrcop0809.doc>.

Accommodation

4.8.12 Issues concerning the quality of the lecture accommodation were noted in the Self Evaluation Report and verified in a tour of facilities provided by the Head of Teaching. In particular, the Review Panel's attention was drawn to the Main Lecture Theatre in the Joseph Black Building, in which the line of sight was restricted for the back three rows and which contained an unreliable data projection system, which was yellowed and flickered: There was also an issue with the Physical Chemistry Lecture theatre where the projection equipment had no dimming facility and the chalk board had seized and could not be rotated. The Panel **recommends** that the Department continues to liaise with Audio Visual and IT Services and Estates and Building to repair the faulty AV equipment and to improve visibility in the Main Lecture Theatre;

and to repair the AV equipment and the blackboard in the Physical Lecture Theatre, as appropriate.

- 4.8.13 The Self Evaluation Report raised the issue of the limited availability of laboratory accommodation to support the teaching of practical chemistry to current and increasing student numbers. It was noted that the RSC required 400 hours of laboratory time, excluding the major project, for accreditation of a degree programme. It was also noted that conversion of a large teaching laboratory for Level 1 and 2 in practical synthesis was in progress and scheduled for completion for 2009-10. The Head of Department confirmed that there were clear and effective lines of communication with Estates and Buildings, who provided regular reports and that the project was currently ahead of schedule. The Review Panel acknowledged that accommodation problems were in the process of being addressed, although concerns remained regarding the reliance on the work placement experience for practical training, especially in light of the current economic climate.

Laboratories: Individual Experience

- 4.8.14 The Review Panel invited the Head of Department to estimate the cost of providing individual laboratory learning experience for all students. This was estimated between £250-500k plus unspecified ongoing costs. It was noted that the main issues were space and venting for additional fume cupboards, and the need to maintain balanced air flows, which were constrained by the Grade A listed building status of the Joseph Black Building. It was reported that a bid to Faculty in this respect had been unsuccessful. The Dean confirmed that the Faculty had not been able to find additional income to fund the required building upgrade, which he explained related to a three-way tension in the Faculty between; the Department having the highest PGR student to staff ratio; sustainability of research achievements through WestChem which required further investment; and the requirement that the Department continued to be able to deliver a significant amount of teaching. However, the Head of Department pointed out that a more realistic target would be to provide individual laboratory learning for Level 3 students and above, which had been costed at £50k. The Panel considered that the Faculty's current financial model presented challenges and was concerned that teaching finances were being starved to invest in research. There were deep concerns regarding the sustainability of the current approach. In the interim the Panel would encourage the Department to investigate ways to streamline experiments and maximise the student learning experience by efficient laboratory design.
- 4.8.15 Following discussions with staff and management the Panel came to the conclusion that there was a lack of understanding of financial models within the Department and Faculty, in particular the connection between income generation and Departmental budgets. This had a stultifying effect on initiative taking, with colleagues generally feeling that extra effort on recruitment, teaching and research would not pay off in benefits to the Department. The Review Panel **recommends** that the Dean and Head of Department should take time to explain to staff how Departmental innovation can be incentivised through investment and if necessary take up the issue with the Vice Principal (Strategy & Resources).

Equipment Budget

- 4.8.16 Students who met with the Review Panel reported that glassware was generally in short supply and was not always clean. The Panel had been shown some very

expensive new equipment during the tour and were interested to know how the Department prioritised their equipment budget. The Head of Department confirmed that the Department had taken advantage of separate and specific funding to resource high-end new equipment which facilitated research and helped attract new students in competition with other HEIs. The Panel explored with the Dean how the budget was devolved from the Faculty and he described a funding model whereby the Departments' individual needs were calculated and then negotiated collegially with other departments in the Faculty to satisfy aspirations. The Panel was disappointed that the purchase and upkeep of routine items of equipment seemed to have a relatively low priority.

Demonstrators

4.8.17 The Review Panel expressed concern regarding reports of a reduction in demonstrator numbers, given the increasing student numbers. The Head of Department confirmed that the demonstrator budget was fixed at £50k and was the biggest single item in the departmental budget. He explained that the reduction was in response to increased costs as more laboratories had been timetabled and the total number of demonstrator hours had slightly increased to match increased student FTE. The Department had considered the effectiveness of previous levels of demonstrator provision and decided that numbers could be reduced without compromising the student learning experience. The Head of Department also reported that he was currently negotiating with Human Resources in respect of increased payments for GTA's (demonstrators). Any increase in payment levels would have significant implications as such an increase in costs would not be matched by an increase in budget and the Department would have to look at other ways to make required savings, e.g. further reductions in numbers and/or the use of video demonstrations. It was noted that current arrangements for laboratory cover includes the Head of the Laboratory who supervises, with one other member of staff, continually for Levels 1 and 2 and with extra support at the beginning of term for Levels 3, depending on the experimental complexity and potential risk factors. The Panel would strongly encourage the Department that any plans should take due cognisance of safety issues.

Health and Safety

4.8.18 The Review Panel was informed by the Head of Teaching that there had been a serious and protracted problem with the fire alarm system, which had resulted in the suspension of weekend working and ultimately, when the system failed, temporary closure of the Department. It was noted that the alarm system was bespoke and hard-wired. Due to restrictions of building design and its listed building status a cheaper wireless option could not be fitted. However, the Panel was encouraged by the efforts of Estates and Buildings, who had worked tirelessly to put into place a series of temporary measures until the alarm system was reinstated.

4.8.19 The Review Panel was concerned by reports from demonstrators that some students were arriving at laboratories without appropriate footwear, laboratory coats and/or safety glasses. The Review Panel would strongly encourage the Department to implement stricter controls to ensure that health and safety protocols are adhered to and that student participation in laboratories is subject to appropriate safety attire.

4.8.20 The Self Evaluation Report stated that applications from disabled students were encouraged although the Department had experienced a particular issue with the reliability of the lift within the Joseph Black Building. The Review Panel was pleased to hear that steps were being taken to improve the reliability of the lift by the replacement of worn-out parts.

5. Maintaining the Standards of Awards.

Course Reviews

- 5.1 The Review Panel was pleased to note from the Self Evaluation Report that a review of all of the Inorganic and Physical Chemistry teaching was scheduled in April 2009 for implementation in 2010-11. A review group had been set up to reflect on the effectiveness of teaching in Chemistry with Forensic Studies which had been co-developed with staff from Forensic Toxicology and introduced at Level 3 in 2004-05. The group would make recommendations for implementation in 2010-11. In the light of forthcoming staff retirements, it was also noted that the teaching of Environmental Chemistry was undergoing a review. This option shared members and part of its remit, with Chemistry with Forensic Studies.

Accreditation

- 5.2 With the forthcoming RSC assessment for the accreditation of the MSci programmes and recognition of the BSc (Hons) programmes scheduled later in session 2009-10, it was noted that the Department relied on RSC accreditation guidelines and the SCQF in the design of its programmes. The external examiners had commented on the relative poor performance of BSc students and the Panel sought clarification on how the Department differentiated between the BSc and MSci, in terms of course descriptors, assessment and/or modes of delivery, and in particular, in respect of the placement year. The Head of Teaching acknowledged that distinguishing between the degrees was a constant challenge and subject to continual review but reassured the Review Panel, that the Department was confident that the mixture of core and specific materials were appropriately differentiated in depth and assessment methods in accordance with RSC guidelines and the SCQF.

6. Assuring and Enhancing the Quality of the Students' Learning Experience

Graduate Attributes

- 6.1 It was noted from the Self Evaluation Report that the Department pays for the first year membership of the Royal Society of Chemistry for Level 3 students and that research undertaken by MSci students, as part of the Frontiers of Chemistry course, had resulted in publications of undergraduate work in research journals. The Review Panel **commends** these initiatives which encourage professional development and enhance graduate attributes.

Bologna

- 6.2 The Review Panel was interested to know what preparations the Department had in place in respect of the introduction of the European Higher Education Area (EHEA) in 2010 and whether they considered Bologna compliance to be an issue of relevance. The Head of Department confirmed that the Department viewed it as an opportunity, which mapped onto the undergraduate programme and confirmed they were currently in discussions with Belgium and the Netherlands and meeting to progress EHEA negotiations.

Student Mobility

- 6.3 The Self Evaluation Report stated that all undergraduate students were encouraged to seek summer placements and that BSc and MSci students had the option of study abroad built into their degree programmes and that these interactions 'contribute to the enrichment of the cultural diversity within the Department'. It was noted from the

documentation provided that the number of incoming students significantly outnumbered outgoing students and the Review Panel was keen to clarify the extent of staff and student participation and, in particular, the extent that student mobility was built into individual teaching modules. Staff members confirmed that outgoing student activity mostly involved MSci students who had elected to go abroad and the limited participation among other groups of students was attributed to issues relating to cost, language and culture. Staff also reported problems associated with incoming Erasmus students in relation to the difficulty experienced in harmonising credit systems and scheduling (teaching blocks). The Panel was encouraged to learn that staff members visited Erasmus students twice a year, which was an opportunity for the Department to map courses and teaching modules to EU structures. However, the students who met with the Panel seemed to have a limited knowledge of the opportunities and were not aware that study abroad could involve shorter visits of one semester. The students suggested that the Department could more effectively promote Erasmus by providing detailed information on practical matters such as accommodation, travel and costs. The Panel **recommends** that the Department reviews how to promote student mobility more effectively, particularly for outward single semester opportunities, and the compatibility of course structure to facilitate this.

7. Summary of Perceived Strengths and Areas for Improvement in Learning and Teaching

Key strengths

- Wide ranging and challenging suite of degree programmes offered;
- The Department's concern for, and awareness of employability of its graduates, which it promotes through the work placements, including the IAESTE scheme, and through its strong links with potential employers;
- Encouragement and support of professional development of graduate attributes, through first year membership of RSC for Level 3 students and participation by students on the Frontiers of Chemistry course. which had resulted in publications of undergraduate work in research journals;
- Science Fundamentals 1X and 1Y courses: providing access for non-traditional students to degree programmes in biological subjects;
- The Interactive Teaching Units;
- Exemplary feedback on staff support as confirmed by students who met with the Panel and 2008-09 NSS feedback of final year students.

Areas to be improved or enhanced

- Development of a Departmental Strategic Plan;
- Review of the Teaching Committee;
- Management and support of staff;
- Incentivise innovations through investment;
- Clarification of the role of the Head of Teaching;
- Engagement with the Annual Monitoring process;
- Availability of teaching space and equipment;
- Feedback on assessment to undergraduate students;
- Engagement with international recruitment mechanisms;
- Support and training of probationary members of staff and demonstrators;
- Programme aims and intended learning outcomes;
- Teaching accommodation and equipment issues to be resolved;

- Coordination and provision of careers advice, in respect of preparation for job applications.

Conclusions and Recommendations

Conclusions

Members of the Review Panel enjoyed their visit to the Department of Chemistry where arrangements made for their comfort and the conduct of the meetings was exemplary. The Panel was impressed by the dedication and progressive attitude of staff and demonstrators within the Department, and with the focus on research-led teaching. The undergraduate students who met with the Panel were enthusiastic and very positive about their learning experience. However, the Panel noted that there were currently significant resource issues, planning developments and numerous curricula reviews underway or outstanding and felt that, given the state of change, a follow-up visit would be beneficial to allow progress to be monitored in detail. The Panel, **recommends** to the Academic Standards Committee that a return visit be made to the Department in two years time by a sub-group of the current Panel to review progress and ensure that issues noted in the above report have been resolved or are being moved towards resolution.

Recommendations

The recommendations interspersed in the preceding report are summarised below. The recommendations have been cross-referenced to the paragraphs in the text of the report to which they refer. They are grouped by the areas for improvement/enhancement noted above and are ranked in order of priority.

Recommendation 1:

The Panel, **recommends** to the Academic Standards Committee that a return visit be made to the Department in two years time by a sub-group of the current Panel to review progress and ensure that issues noted in the above report have been resolved or are being moved towards resolution [*Conclusions*].

For the attention of: **Head of Department
Convener, Academic Standards Committee
Senate Office**

Recommendation 2:

The Review Panel **recommends** that the Department develops a strategic plan which clearly articulates key strengths within the wider environmental context (competitors, industry/economy and perceived demand) and how this would impact on future investment/direction in the teaching, learning and assessment of Chemistry. The Panel attached considerable importance to this recommendation and wishes it to be addressed forthwith, as many of the following recommendations depend upon it [*paragraph 4.8.1*].

For the attention of: **Head of Department**

Recommendation 3:

The Review Panel **recommends** that the Department clarify the remit of the Teaching Committee to include: the development and implementation of a Teaching Development Strategy for the next 5 years; reviews of the curricula and sustainability of courses; progression issues; the development of PGT courses; and consideration of the effectiveness and attractiveness of the full range of programmes on offer. Any

curriculum review should be conducted with reference to guidance and advice from University Services, such as the Learning and Teaching Centre and the Equality and Diversity Unit [paragraph 4.7.3].

For the attention of: **Head of Department
Director of Equality and Diversity
Director of the Learning and Teaching Centre**

Recommendation 4:

The Review Panel **recommends** that the Dean and Head of Department should take time to explain to staff how Departmental innovation can be incentivised through investment and if necessary take up the issue with the Vice Principal (Strategy & Resources) [paragraph 4.8.15].

For the attention of: **Head of Department
Vice Principal (Strategy and Resources)**

Recommendation 5:

The Panel **recommends** that the Department continues to liaise with Audio Visual and IT Services and Estates and Building to repair the faulty AV equipment and to improve visibility in the Main Lecture Theatre and to repair the AV equipment and the blackboard in the Physical Lecture Theatre, as appropriate [paragraph 4.8.12].

For the attention of: **Head of Department
Director of Estates and Buildings
Director of Audio Visual and IT Services**

Recommendation 6:

The Review Panel **recommends** that the Department liaises with Learning and Teaching Centre and Equality and Diversity Unit, in its review of demonstrator training, which would include appropriate health and safety training and that the Department considers frontloading extra demonstrators to cope with the extra student demand at start of session [Paragraph 4.8.8].

For the attention of: **Head of Department
Director of the Learning and Teaching Centre**

Recommendation 7:

The Review Panel **recommends** that the Department develops a plan to deliver learning opportunities for students to work on experiments individually as well as in pairs/groups [paragraph 4.7.1].

For the attention of: **Head of Department**

Recommendation 8:

The Review Panel **recommends** that the Department continue its plan to review assessment feedback processes and to improve the timescales for and quality of the feedback provided to students. The Department should seek the support and guidance of the Learning and Teaching Centre at an early stage of its review [paragraph 4.3.2].

For the attention of: **Head of Department
Director of the Learning and Teaching Centre**

Recommendation 9:

The Review Panel **recommends** that the Department liaises with the Learning and Teaching Centre to identify good practice from other Departments to improve the preparation it gives students for non-traditional assignments [*paragraph 4.4.3*].

For the attention of: **Head of Department
Director of the Learning and Teaching Centre**

Recommendation 10:

It was noted that the Head of Teaching's relatively heavy workload might undermine his ability to plan and manage staff succession and the Panel **recommends** that the Department clarifies the role of the Head of Teaching to ensure an appropriate remit [*paragraph 4.8.3*].

For the attention of: **Head of Department**

Recommendation 11:

The Review Panel **recommends** that the Department review its support of probationary members of staff to ensure that they are allocated appropriate workloads, which take cognisance of the demands of the NLTP. The Department should also ensure that the mentoring arrangement is in place and effective over the entire probationary period and that clearly articulated guidelines for probationary staff are developed, which would usefully include key contacts [*paragraph 4.8.9*].

For the attention of: **Head of Department**

Recommendation 12

The Panel **recommends** that the Department consult with the Academic Development Unit of the Learning and Teaching Centre and with Human Resources to determine the appropriate course of action to address any issue of poor teaching [*paragraph 4.8.4*].

For the attention of: **Head of Department
Head of the Academic Development Unit
Human Resources Manager for Physical Sciences**

Recommendation 13:

The Review Panel considered that the programme aims could benefit from further clarification, and **recommends** that the Department revise the programme aims to further differentiate between the MSci and BSc, by means of a clearer mapping of course workload to SCQF credits and levels [*paragraph 4.1.1*].

For the attention of: **Head of Department**

Recommendation 14:

The Review Panel **recommends** that the Department survey the number of laboratory hours and the associated credit levels at a number of other Higher Education Institutions that offer Chemistry subjects and consider making adjustments to its provision where necessary to bring it into line with competitors [*paragraph 4.3.5*].

For the attention of: **Head of Department**

Recommendation 15:

The Panel **recommends** that the Department consider how it might raise awareness amongst staff, in terms of foreseeable trends in the external environment for recruitment [*paragraph 4.5.4*].

For the attention of: **Head of Department**

Recommendation 16

The Panel **recommends** that the Department reviews how to more effectively promote student mobility, particularly for outward single semester opportunities, and the compatibility of course structure to facilitate this [*paragraph 6.3*].

For the attention of: **Head of Department**

Recommendation 17:

The Panel **recommends** that the Department continues to review its AMR process, in compliance with University Quality Assurance process, and draw its attention to the Code of Practice in Annual Monitoring available at: <http://senate.gla.ac.uk/ga/acmr/amrcop0809.doc> [*paragraph 4.8.11*].

For the attention of: **Head of Department**

Recommendation 18:

The Panel **recommends** that the Department update the information on Intended Learning Outcomes in the course handbooks in accordance with the Guidelines for Writing Aims and Intended Learning Outcomes at the Programme and Course Level, prepared by the Learning and Teaching Centre [*paragraph 4.2.3*].

For the attention of: **Head of Department**

Recommendation 19:

The Review Panel **recommends** that the University are cognisant of the department's ability to allow sufficient revision time before examinations, when the new academic year structure is reviewed at the end of this session [*paragraph 4.3.4*].

For the attention of: **Convener of Academic Structures Implementation Group**

Recommendation 20:

The Review Panel **recommends** that the Department liaises with the Careers Service in respect of the coordination of career's advice to students and that the provision includes appropriate preparatory support for job applications [*paragraph 4.4.4*].

For the attention of: **Head of Department
Director of Careers Service**

Recommendation 21:

The Review Panel **recommends** that course handbooks clearly articulate the relationship between performance and credit [*paragraph 4.8.10*].

For the attention of: **Head of Department**