



UNIVERSITY of LIMERICK

O L L S C O I L L U I M N I G H

Quality Review of the Department of Chemical and Environmental Sciences

The University of Limerick (UL), through its membership of the Irish Universities Quality Board (IUQB), follows an established process for Quality Assurance (QA) and Quality Improvement (QI). This involves a seven-year cycle during which all Departments work to improve the quality of their programmes and services and undergo a rigorous self evaluation prior to a quality review by internationally recognised experts in the field.

The process itself has evolved as a result of the Universities Act, 1997 in which the responsibility for QA/QI was placed directly with the individual universities. The UL Quality Support Unit (QSU) web site provides an elaboration of this process and the state of progress.

The broader picture is described in the publication *A Framework for Quality in Irish Universities* which can be downloaded from the IUQB web site: <http://www.iuqb.ie/>

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NOTE – whereas many academic departments take the opportunity to incorporate their responses to individual recommendations in this report, CES department has chosen not to do so.

1.0 Background

1.1 Legislative Framework

The University of Limerick, in common with all the universities in the Republic of Ireland, falls within the Universities Act, 1997. This Act specifies the responsibilities of universities in Ireland for Quality Improvement and Quality Assurance. Section 12 stipulates that, 'The objects of a university shall include - ... to promote the highest standards in, and quality of, teaching and research'.

Section 35 (1) of the Act further requires that each university Governing Authority 'shall...require the university to establish procedures for quality assurance aimed at improving the quality of education and related services provided by the university'. The Act provides a framework for the universities to develop their quality processes. Section 35 requires each university to review the quality of the work of all faculty, academic Departments and service (including administrative) Departments on a ten-year cycle. In particular 'The procedures shall include ... assessment by those, including students, availing of the teaching, research and other services provided by the university'.

Although each university is free to develop its own procedures in fulfilling its obligations under the Act, close co-operation has been achieved through the co-ordinating role of the Irish Universities Association Quality Committee, (IUAQC). Accordingly, the universities have developed a framework comprising a set of common principles and operating guidelines for quality improvement and quality assurance. These principles and guidelines have been integrated into each of the universities procedures, which ensure coherence through the university system, while maintaining the autonomy of each university and its individual institutional culture.

More detail is available at <http://www2.ul.ie/pdf/585256597.doc> and www.iuqb.ie

1.2 The Irish Universities Quality Board

The Governing Authorities of the seven Irish universities established the Irish Universities Quality Board (IUQB) in February 2003. This board comprises representatives of the Conference of Heads of Irish Universities (CHIU) and a number of external members.

The aims of the IUQB are:

- To increase the level of inter-university cooperation in developing Quality Assurance processes
- To represent the Irish universities nationally and internationally on issues relating to quality assurance and quality improvement
- To articulate, on behalf of the Governing Authorities of the universities, the resource implications of recommendations for quality improvement.

The IUQB subsumed the roles and functions formerly carried out by the IUQSC (Irish Universities Quality Steering Committee). More detail is available at www.iuqb.ie

1.3 The Quality Review Process

The common framework adopted by the Irish universities for their Quality Assurance/Quality Improvement systems consistent with both the legislative requirement of the Universities Act 1997 and international practice comprise the following stages:

1. Preparation of a self-assessment report by the unit taking into account feedback from students and customers.
2. Quality (Peer) Review involving external experts, both nationally and internationally, who have visited the Department, met the students and studied the Self Assessment.
3. Quality Review Report, made publicly available by the Governing Authority of the university, incorporating the reactions and quality improvement plans of the Division and University.
4. Continuing improvement through implementation within the resources available to the university.

More detail is available at www.quality.ul.ie

1.4 Management of Quality in the University

The Vice President Academic and Registrar has overall responsibility for implementation of Quality Assurance/Quality Improvement policy and implementation at the University of Limerick. Implementation is carried out by the Director of Quality. The planned schedule of Quality Review of both academic and support departments was commenced in the year 2000, with the first full cycle of units within the University being reviewed within a seven-year cycle.

Academic departments are reviewed against international standards as described in the document "A Guide to the Quality Review Process for Academic Departments", which is available on the UL website at:

http://www2.ul.ie/web/WWW/Services/Quality/Documents_to_Download .

In 2006, the university decided to implement a bespoke quality management system (QMS) and developed a suitable template with the assistance of external quality experts. This system is described in the document "Quality Management Systems – Standard Framework for Support Departments".

More detail is available at

http://www2.ul.ie/web/WWW/Services/Quality/Academic_Departments/Quality_Review_Process

2.0 The Department of Chemical and Environmental Sciences

The Department of Chemical and Environmental Sciences (CES) is one of ten departments in the Faculty of Science & Engineering within the University of Limerick (UL). CES is one of the larger departments in terms of undergraduate and postgraduate student numbers, and research activity. In terms of programmes run within the department, CES offers Bachelor of Science degrees in Pharmaceutical & Industrial Chemistry, Industrial Biochemistry, Environmental Science and Health & Safety, an evening undergraduate Diploma in Health & Safety, and a Graduate Diploma in Chemical Engineering.

The mission of CES is to deliver excellent teaching and research, thus:

- Facilitating the individual development of all our students
- Providing high-quality qualifications relevant to national and international employment markets
- Advancing scientific knowledge through the publication and industrialisation of research results

The role of CES is to implement policy primarily determined at Academic Council, Faculty Board and UL senior administration levels, especially in relation to the UL Strategic Plan and the Faculty of Science & Engineering Strategic Plan.

The goal of CES is that all faculty be research-active and CES actively supports the development of research and research led institutes. CES faculty were instrumental in setting up the [Materials and Surface Science Institute](#) (MSSI) with the first director of MSSI (1999-2004) seconded from CES, and the second and current director also a member of CES (2004 to present). From a total of 38 MSSI members, 12 are CES faculty while MSSI facilities and equipment are used by nine CES faculty based within the MSSI building. Energy-related activities are catered for by the [Charles Parsons Initiative](#) (CPI), in which 10 CES faculty participate. Environmental interests come under the umbrella of the [Centre for Environmental Research](#) (CER), in which nine CES members participate.

CES comprises 22 full-time academic staff and 13 support staff. The 22 academics include two professors, three associate professors, 14 senior lecturers and three junior lecturers (seconded faculty are not included) There are in addition, two senior research fellows and one teaching assistant. Other academics, from within and outside of UL, contribute to the work of the department some of whom have adjunct appointments. Support staff includes 10 technical staff (a chief technical officer, eight technical officers and one senior laboratory assistant) and two administrators.

CES continually strives to monitor and improve all aspects of its activities and is involved in a large number of student centred activities including a workforce mobilisation programme, the science learning centre, student surveys and the delivery of Tusnua, a new programme development initiatives in science learning, to mention but a few.

More details on the CES department activities can be found on the [CES Web Page](#).

3.0 The Follow-up Process

The Quality Review process occurs on an approximately seven-year cycle at the University of Limerick. An average of five academic Departments are reviewed annually. Once the Peer Review Group report is finalised, the Department concerned immediately sets about planning its response to the issues raised therein.

The self-evaluation process is intended to be a reflective exercise in which a Department/Division should identify many of its strengths and weaknesses and develop plans to strengthen and grow as appropriate. Quite often, the Peer Review Group (PRG) will reinforce these issues and may identify areas of concern that were overlooked. In many cases, the PRG will also highlight the strengths of the Department and encourage faculty and staff to take advantage of these.

After the department and the university have been given time to respond to the issues raised; the Peer Review Group's report will be made available to the wider community through the University's web site. Normally, the report is available within the University less than four weeks after the PRG visit. Responses and plans for action are incorporated into the report and are subject to the approval of the Deans' Council.

Presentation to the University's Governing Authority usually follows within six months of the PRG visit. The Governing Authority will publish the Peer Review report, including reactions and plans, immediately following approval.

It is expected that a review of progress in implementing recommendations and investigating issues raised would occur quarterly for the two years following the Peer Review Visit. Progress Reports will be published as deemed appropriate.

Date	Action
Dec 2009	CES department is issued with Peer Review Group report and required to prepare reactions and plans for Quality Improvement as appropriate. The report is circulated to all members of Management Committee for comment.
Mar 2010¹	Reactions and plans, from all levels, incorporated into the document. Quality Improvement Action Plan developed and circulated to Deans' Council. Head of Division presents an overview of key issues from Quality Review Report to the Deans' Council. PRG Report with Responses and Quality Improvement Action Plan are tabled at Executive Committee meeting for discussion.
Dec 2010	PRG Report, incorporating reactions, is presented to UL Governing Authority for approval for publication.

¹ Department response delayed by industrial action.

4.0 Preliminary Comments of the Peer Review Group (PRG)

The Peer Review Group (PRG) commends the detailed analysis provided in the self-assessment report by the Department of Chemical and Environmental Sciences (CES), in particular the engagement of different groups of staff, led by senior members of the department, in identifying both strengths and weaknesses in each of the areas considered. The PRG also noted the readiness of all members of the department to engage in frank and open discussion with the review group.

Faculty and support staff are clearly committed to providing an excellent student support service. This includes an 'open door' policy offering students informal access to teaching staff, provision of tutorials in association with each lecture course, encouragement of students to use the facilities offered by the science and maths learning centres, and enthusiastic and well-qualified technical staff accessible in laboratories. Both graduates and students on placement are seen by the relevant industrial partners as offering sound academic knowledge and good practical and interpersonal skills which allow these individuals to fit easily into the workplace – qualities recognised by employers as 'the UL brand'. The PRG is concerned, however, that in a climate where both student numbers and the range of programmes are growing, and with students less well-prepared on their entry to university, the load on staff is becoming unsustainable. There is therefore an urgent need to rationalise curricula, formalise student support systems and promote early engagement of students in order to maintain the quality of the output.

CES comprises staff from diverse disciplines, and teaching and research interests reflect this range. Whilst the PRG recognises the need for new programmes and welcomes their introduction, it is concerned that the portfolio is becoming less integrated. This is causing a high staff workload and the dependence of each programme on a small number of individuals. As a result, the department could become less of a coherent whole. However, the establishment of a departmental management team would help maintain integration.

Most faculty are research-active, with several having an international profile. Many are affiliated to the Materials & Surface Science Institute (MSSI), which offers excellent facilities for those staff and for associated postgraduate research students. However, there are areas of taught provision and research which do not overlap with MSSI interests and these need to be supported within a culture in which teaching is underpinned by research and/or innovative consultancy.

In summary, the PRG believes that CES has significant strength in both its taught provision and its research, but that there is a need for considerable further formalisation of procedures within the department if these strengths are to be maintained. The PRG would strongly encourage the department to draw on good practice elsewhere as it implements these changes.

5.0 *The Report of the Peer Review Group*

5.1 Mission

Commendations

The PRG commends the following:

5.1.1 The strong focus of the CES mission on student needs and research excellence.

5.1.2 The revision and adoption of the mission by staff consensus.

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Recommendations

The PRG recommends that the department:

5.1.3 Put implementation deadlines on its goals and identify milestones against which progress can be measured.

5.1.4 Recognise the need to adapt the language of the mission for use in promotional campaigns undertaken by CES, particularly to second-level students.

5.1.5 Develop a distinctive and inclusive CES process to prioritise and sequence departmental goals, drawing on all relevant staff.

5.2 Design and Content of Curriculum

Commendations

The PRG commends the following:

- 5.2.1 The system of mostly compulsory modules which provides a comprehensive syllabus for each programme, covering basic science as well as applied and industrial aspects of each discipline.

- 5.2.2 The eight-month industrial placement and final year research project which are a significant strength of the courses.

- 5.2.3 The programmes which provide students with a knowledge base and skills that are valued highly by industrial employers.

Recommendations

The PRG recommends that the department:

- 5.2.4 Review all programmes against a benchmark of similar courses at other universities, with a view to the 'slimming down' of programmes to reduce curriculum overload and to allow the focusing of resources.

- 5.2.5 Review the provision of elective modules for each degree programme and introduce some elective elements in the final year of all programmes.

- 5.2.6 Ensure that the Environmental Science programme includes an appropriate amount of fieldwork.

- 5.2.7 Take further advantage of the good relationships that exist between CES and industry and introduce contributions from industrial partners as part of the 1st or 2nd year curricula.

5.3 Teaching, Learning and Assessment

Commendations

The PRG commends the following:

- 5.3.1 The high level of professional care and ownership exhibited by the academic, technical and administrative staff.

- 5.3.2 The excellent learning support facilities available to students.

Recommendations

The PRG recommends that the department:

- 5.3.3 Develop strategies for improving the attendance record of students, such as the introduction of registers and marks-based incentives.

- 5.3.4 Implement and document a structured and formal annual review process for each programme, including reviews of student and industrial opinions.

- 5.3.5 Establish a formal staff/student liaison group for each programme.

- 5.3.6 Introduce a common teaching, learning and assessment strategy for all programmes, including modes of delivery, peer review of delivery, common assessment methods, feedback mechanisms and deadlines for feedback.

- 5.3.7 Implement a compulsory and timetabled tutorial system with significantly fewer tutorials for each module than at present.

5.4 Faculty and Support Staff

Commendations

The PRG commends the following:

- 5.4.1 The commitment of the teaching staff to the students' learning experience.

- 5.4.2 The high proportion of CES faculty who have been formally recognised for their teaching excellence.

- 5.4.3 The multi-disciplinary capabilities of CES staff and their ambition in servicing a diverse and complex set of programmes.

- 5.4.4 The ambition of CES faculty to combine research activities with high teaching loads.

Recommendations

The PRG recommends that the department:

- 5.4.5 Develop strategies in liaison with the Faculty of Science & Engineering to ensure sufficient and appropriate replacement of high-level staff lost to secondment and retirement, with due regard to emerging opportunities for teaching and research.

- 5.4.6 Consider how service teaching for programmes elsewhere in the university can be consolidated and effectively resourced while maintaining quality.

- 5.4.7 Use the PDRS as the main focus for staff development and training.

- 5.4.8 Implement a more formal system for mentoring new faculty.

- 5.4.9 Introduce appropriate in-service management and leadership training for faculty to support the CES change process.

5.5 Facilities and Learning Resources

Commendations

The PRG commends the following:

- 5.5.1 The excellent utilisation of available resources within the department.

- 5.5.2 The strong working relationship between the department and the library.

- 5.5.3 The commitment of the technical staff to running the laboratory elements of all programmes, particularly with regard to safety-related matters.

- 5.5.4 The excellent departmental safety record which should be more widely publicised.

Recommendations

The PRG recommends that the department:

- 5.5.5 Work more closely with the Faculty and Student Academic Administration (SAA) to ensure the earlier delivery of timetables to allow effective scheduling of classes and laboratories.

- 5.5.6 Liaise with the University on the introduction of a capital depreciation system for the replacement of teaching laboratories and equipment.

- 5.5.7 Formalise a compulsory training programme for all laboratory demonstrators, to include the scientific, pedagogic and safety aspects of laboratory work.

- 5.5.8 Liaise with other departments to find under-utilised computer laboratories where licensed software can be made available.

5.6 Student Guidance and Support

Commendations

The PRG commends the following:

- 5.6.1 The excellent support for student learning provided by the Science Learning Centre and the Maths Learning Centre.

- 5.6.2 The accessibility of all staff to students for individual consultations.

- 5.6.3 The guidance that undergraduates receive from all staff, including the head of department (HoD), academic and technical staff, and postgraduate demonstrators, which is warmly acknowledged by the students themselves.

Recommendations

The PRG recommends that the department:

- 5.6.4 Make more formal use of the academic advisor system: in addition to being available for informal meetings at the request of the student, advisors should meet with each student once per semester to discuss the advisee's academic progress.

- 5.6.5 Introduce compulsory 'study skills' sessions for undergraduates early in the 1st year to ensure that the students know how to make full use of their learning opportunities.

- 5.6.6 Involve a second person, in addition to the supervisor, in the mentoring of each postgraduate research student.

- 5.6.7 Introduce standardised practices for the supervision of postgraduate research students to ensure the quality of their experience.

- 5.6.8 Ensure that the six-hour stipulated maximum for demonstration and other teaching by research students is strictly adhered to.

5.7 Research Activity

Commendations

The PRG commends the following:

- 5.7.1 The strong commitment to research by all faculty.

- 5.7.2 The existence within CES of a vibrant research community of postgraduate students and postdoctoral fellows.

- 5.7.3 The existence within CES of areas of national and international excellence.

- 5.7.4 The fact that the department has access to a good instrumentation base and infrastructure.

Recommendations

The PRG recommends that the department:

- 5.7.5 Formulate a departmental research strategy that encompasses the aspirations of institute- and non-institute-based staff, including links with regional industrial partners.

- 5.7.6 Define and benchmark outputs required by individual faculty to meet national and international levels of excellence.

- 5.7.7 Introduce a formalised code of practice and training programme for postgraduate research students, including generic skills and training for demonstrators.

- 5.7.8 Introduce a formalised mentoring policy to support the research activities, including postgraduate supervision, of all early career faculty.

5.8 Quality Management

Commendations

The PRG commends the following:

- 5.8.1 The intention of the current quality review team to monitor the implementation of the improvement plans of the department over the coming two years.
-
- 5.8.2 The department's continuing success in producing the distinctive 'UL brand' of student, with good problem-solving ability, communication skills and adaptability, which is still very recognisable amongst employers.

Recommendations

The PRG recommends that the department:

- 5.8.3 Develop a structure whereby students can provide 'real-time' feedback to the programme committees and ensure that students are informed of resulting discussion and action taken.
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- 5.8.4 Liaise with the Faculty and the University to ensure that the HoD is explicitly involved in decisions that affect the department.
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- 5.8.5 Liaise with the Faculty and the University to ensure that faculty are incentivised to participate actively in the management of the department, leading to more structured succession planning.
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- 5.8.6 Liaise with the Faculty and the University to ensure timely and accurate provision of appropriate statistical information concerning the student life-cycle.

5.9 Quality Improvement Plan

Commendations

The PRG commends the following:

- 5.9.1 The detailed quality improvement plan included in the self-assessment report, in particular the identification of those responsible for delivering its implementation.

Recommendations

The PRG recommends that the department:

- 5.9.2 Consider the establishment of a departmental management team to oversee teaching and research quality.
-
- 5.9.3 Spread the responsibility for implementation of the plan more widely across the department.
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- 5.9.4 Include timescales and milestones with each action point.
-
- 5.9.5 Benchmark the department against its peers in order to evaluate the actions in the plan.

Appendices

A Membership of the Peer Review Group:

Prof. Gaynor Taylor	(Chair) - Quality Consultant, UK & France
Dr. Brendan Finucane	Former Director of Enterprise Ireland
Dr. Michael Gillen	Senior Executive. Pharmaceutical Ireland
Prof. Paul Worsfold	Professor of Analytical Chemistry, University of Plymouth,
Dr. Maureen Taylor	Senior Lecturer, Division of Molecular Biosciences Imperial College London & Exeter College Cambridge
Ms. Ailish O'Farrell	Recording Secretary

B Membership of the CES Quality Team:

Dr. Catherine Adley	Head of Department
Prof. Richard Moles	Environmental Science
Dr. John Mullane	Chemistry & Process Technology
Ms. Maria Munroe	Chief Technical Officer
Prof. Tony Pembroke	Biochemistry
Ms. Ciara Tuohy	Department Co-ordinator
Prof. Gary Walsh	Industrial Biochemistry

C Contact

The Peer Review Group were given the opportunity over three days to talk to the Chemical and Environmental Sciences Quality Team both formally and informally. Meetings with staff, postgraduate & undergraduate students and others were scheduled as group sessions. The Review Group was given the opportunity to meet all staff during a visit to the facilities of the department and this was most helpful.

All the meetings provided extremely useful additional information to support the SAR.

END of Report.