University College Cork
National University of Ireland, Cork

Quality Improvement/Quality Assurance

Peer Review Group Report

Department of Computer Science

Academic Year 2001/02

25 April 2002

Members of the Peer Review Group:

Name	Affiliation	Role
1. Professor Patrick Fitzpatrick	Mathematics Department, UCC	Chairman
2. Dr Prathima Agrawal	Telcordia Technologies, New Jersey, USA	External expert
3. Professor Gerard Lyons	Department of Information Technology, NUIG	External expert
4. Professor Martin Stynes	Mathematics Department, UCC	Rapporteur

Timetable for conduct of Peer Review Group Site Visit

Department of Computer Science

Wednesday 13 March 2002

18.00 – 19.30 Meeting of members of the Peer Review Group in Suite 2, Business Centre, Kingsley Hotel
Briefing by Director of Quality Promotion Unit, Dr N. Ryan.
Group agrees final work schedule and assignment of tasks for the following 2 days.
Views are exchanged and areas to be clarified or explored are identified.

20.00 Dinner for members of the Peer Review Group and Head of Department and Departmental Co-ordinating Committee (Professor Cormac Sreenan, Dr Barry O'Sullivan, Dr Eoin Healy).

Thursday 14 March 2002

08.30 – 09.00 Convening of Peer Review Group in Departmental Meeting Room, 3rd Floor, Kane Building

09.00 – 13.00 Consideration of Self-Assessment Report and other inputs along with all department staff, including administrative / technical / support staff, as appropriate. Time will be allowed for private meetings of members of the Peer Review Group with members of staff.

09.00 Professor Cormac Sreenan, Head of Department
09.30 Departmental co-ordinating committee
10.00 Mr. Leslie Brooks, Administrative Officer
10.45 Mr. Dave O'Byrne, Systems Manager
11.30 Professor Eugen Freuder, SFI Principal Investigator
12.15 Professor Jim Bowen
12.30 Ms. Lisa Stacey

13.00 – 13.30 Working private lunch for members of Peer Review Group

13.30 – 15.00 Visit to core facilities of Department, escorted by Professor Cormac Sreenan. Tour to include
Kane Building, Brighton Villas, Portacabin facilities, Research Centre

15.30 – 16.30 Meetings with representative selections of students, recent graduates, employers, as appropriate *(arranged by the department).*

16.30 – 17.00 Dr Ruth Davis, Research Support Officer, Office of Vice-President for Research Policy & Support

18.30	Meeting of Peer Review Group to identify remaining aspects to be clarified and to finalize tasks for the following day. Working private dinner for members for the Peer Review Group

Friday 15 March 2002

08.30 – 09.00	Convening of Peer Review Group in Departmental Meeting Room, 3rd Floor, Kane Building
09.00 – 09.30	Professor Áine Hyland, Vice-President and member of the Executive Management Group of the university
09.30 – 10.00	Dr. Eoin Healy
10.00 – 10.30	Visit to Q+2, Boole Library. Meeting with Ms. Margot Conrick, Head of Information Services and Mr. Richard Bradfield, Subject Librarian
10.30 – 11.00	Visits to facilities such as lecture theatres and Computer Services, etc. as appropriate
11.00 – 11.30	Coffee/Tea
11.30 – 12.00	Professor Paul Giller, Dean of Science Faculty
12.30 – 13.00	Meeting with Professor Cormac Sreenan, Head of Department (to clarify any outstanding issues)
13.00 – 14.00	Working Lunch for members of the Peer Review Group
14.00 – 17.00	Preparation of first draft of final report
17.00 – 17.30	Exit presentation, to be made to all staff of the Department by the Chair of the Peer Review Group or other member of Peer Review Group as agreed, summarising the principal findings of the Peer Review Group. (Note: the presentation is not for reply by the staff of the department at this point in time) Venue: G19, Kane Building
19.00	Working private dinner for members of the Peer Review Group to complete drafting of report and finalization of arrangements for speedy completion and submission of final report.

Saturday 16 March 2002

Externs depart

Timetable comments

The timetable was in general satisfactory, but there were some significant shortcomings. It did not schedule meetings between the Peer Review Group (PRG) and a true cross-section of the Computer Science Department staff and students. At the request of the PRG additional meetings with junior staff and with students (both undergraduate and postgraduate) were included in the schedule. The Department was unable to arrange meetings with past graduates (apart from postgraduates) or with industry representatives. The times allocated for visits to facilities and the Library were deemed excessive and consequently were shortened.

Peer Review

Methodology

The PRG was chaired by Professor Fitzpatrick. Professor Stynes acted as Rapporteur. Dr Agrawal and Professor Lyons were responsible for the analysis of research within the Department. All four members provided input in the other sections of this report. A first draft of the Report was prepared on the final evening of the visit, with organizational guidance and technical support from Dr N. Ryan.

Self-assessment report

The self-assessment report contained much information, yet the mass of details was not always summarized in an easily-read way. Furthermore, some basic facts were omitted. Consequently the PRG needed to request a copy of the Department's strategic plan, a list of its module descriptions, an overview of research interests and research groups, a summary of its research publications in the last 5 years, a list of courses allocated to academic staff in recent years, etc. It should be noted that all information requested was provided quickly and willingly by the Department.

Department Details

The Department has a healthy profile in terms of ages of staff and their distribution across job grades. Apart from one female part-time Lecturer, all the academic staff are male, reflecting the general distribution of the genders in the CS area.

The PRG computes the following based on current-year figures from the Registrar's Office. The student/staff ratio is 658/37.89 = 17.37 (average over all staff) or 658/26 = 25.31 (average over all full-time permanent staff). Full-time staff teach the equivalent of 395 FTEs while part-time staff teach 147.5 FTEs, so the percentage taught by part-time staff is 147.5/(147.5 + 395) = 0.27, i.e., 27%, rather than 50% as indicated in the self-assessment report (p.10). The PRG recognizes that the higher figures contained in the self-assessment report are computed using statistics from the year 2000/2001, and that the discrepancy may partly reflect a temporary manifestation of the current economic climate and other factors outside the Department's control. Nevertheless, most of the reduction in the student/staff ratio in recent years is attributable to staff increases rather than a fall in student numbers. The PRG is therefore of the opinion that the assertion of a student/staff

ratio of 36:1 for 2001/2002, compared with 35:1 for 1995/1996, and the statement "…the effect of staff increases has not addressed the fundamental problem that existed in 1995/96; in fact, the situation is slightly worse" (self-assessment report p.11) does not accurately reflect the current state of affairs.

The physical facilities of the Department are extremely poor; in fact they are the worst of any IT department of any university in this country, and arguably worse that those in several of the Institutes of Technology. The Department's staff and equipment are scattered over several locations from one end of the campus to the other, and one building (in Brighton Villas) seems to be in an almost dangerous state of physical disrepair.

The Department has increased its intake of students in recent years in response to government skills initiatives, but believes it has not received its due financial reward from UCC.

Comment and recommendations
The PRG is convinced that the single most pressing need for the Computer Science Department is the provision of a new IT building. Vice-President Áine Hyland confirmed to the PRG that this is UCC's top building priority and that it will receive the strongest possible support from the administration.

Progress has been made by UCC on previous commitments given to the Department regarding a lower student/staff ratio. The Dean of Science confirms that there is a continued commitment to the conversion of posts from temporary to permanent and from part-time to full-time, and this is strongly supported by the PRG.

According to the Dean of Science, funding from skills initiative programmes will shortly begin to flow to the Department, and in a more transparent way. This change is welcomed by the PRG.

Department Organization and Planning

The recently-introduced committee structure of the Department is a very positive initiative.

Technical systems support within the Department is well organized and provides an excellent service. Recent sanction for a Departmental Manager will assist Department organization and planning.

Some members of the academic staff are carrying a disproportionately heavy burden of the overall administrative work, while others appear to have little or none.

Certain administrative tasks can apparently only be carried out by one person.

Comment and recommendations

It may be argued that there are too many small committees with narrow functions. This may have the effect of isolating the staff from one another in the development of the Department. The committee structure should be re-examined with a view to possible organisation into a smaller number of larger committees with wider areas of responsibility. This would multiply the number of working relationships between staff and amplify their collective responsibility for the development of the Department.

While present structures keep the Department running, it must engage in strategic planning for its long-term future development. In that context, the Department should revise its Mission Statement, in particular to repair the omission of teaching and learning

The creation of a Deputy Head of Department post, with associated authority, e.g. to sign purchase orders when the Head is absent, would facilitate the everyday work of such a large and complex department.

The dangers inherent in the reliance for key administrative tasks on one person are apparent. Training of backup personnel for such tasks should be instituted, to provide for gaps caused by illness, retirements, etc. UCC should carry out a comprehensive review of the administrative support available for the Department.

Load balancing of the administrative duties for academic staff should be carried out, and this should be done in a fully transparent manner.

Teaching and Learning

The Department has responded very well to requests for increases in undergraduate and postgraduate places, and has reoriented its undergraduate programme to include applied areas.

Students (both undergraduate and postgraduate) are generally happy with their training and are supportive of the Department. Many academic staff provide class notes on the Web and this is greatly appreciated by students.

The 3rd-year industrial placement is widely recognized as being a very positive contribution to the overall programme.

In assigning workloads, from 2002-3 onwards, account will be taken of all aspects of teaching at both undergraduate and postgraduate level (such as project supervision).

The marking and assessment of 4th-year taught modules, especially projects, are uneven. No mechanism exists to ensure that all academic staff grade students according to comparable scales of difficulty.

Comment and Recommendations

There should be equity in the distribution of 4th-year projects among academic staff; in particular, a reasonable limit on the number of projects that can be supervised by any one staff member should be set in advance. Project proposals should be encouraged in those areas where the Department wishes to develop its future research. There should be greater evenness in the levels of difficulty of these projects and in their assessment. The PRG recommends the use of the guidelines recently issued by the Student Needs and Curriculum Development Committee for the assessment of projects.

To address the perceived inconsistencies in the difficulty level of different 4th-year modules, the PRG recommends decreasing the range of options in 4th year, so that a greater number of students will be forced to take each remaining module, thereby enabling a greater comparison of marks attained by the same students in different modules. All students should take at least one compulsory core module, which can act as a benchmark for comparison with the marks obtained in other modules.

While it is not UCC policy that anonymous evaluation by students of courses and academic staff be compulsory, the PRG strongly recommends its use for all courses and all staff.

The proposed introduction of a "greater variety of degree titles" (self-assessment report p.139, see also p. 9/16 in the sixth staff questionnaire) is not recommended if this implies splitting the degree programme up into a number of denominated degrees. The PRG are of the opinion that the resulting fragmentation of both the programme and the student cohort would have an overall negative effect.

Each course or module that has associated laboratory hours should also have assigned by the Department an associated minimum schedule of visits by the academic staff involved in its delivery.

The PRG welcomes the introduction of mechanisms for balancing the teaching loads of academic staff (as far as possible) across the Department, and recommends that this be done in a transparent way.

Research and Scholarly Standing

The external assessors are of the opinion that the research output of the Department is on average low, that it has too few postgraduates for its size (even though numbers have grown in recent years), and that, while it has been successful in attracting funding in certain areas, overall totals are low for its size.

One of the strongest research areas is in AI, which has a close link with the Cork Constraint Computation Centre, but some key areas of computer science are missing from the research profile.

In the research of the Department, many individuals work independently.

Comment and Recommendations
The PRG recognizes that the Department may have difficulties in attracting postgraduates, that are special to itself rather than those (such as employment opportunities) that apply to all Computer Science departments. In particular, it again draws attention to the exceptionally poor physical facilities.

However, the PRG suggests that an overall research strategy is needed. The Department should be active in identifying and developing future directions in CS research. The PRG recommends that the new appointments, recently approved, should be targeted at selected areas (such as systems and networks, databases, multimedia, parallel and distributed computing, and programming languages). Clustering of research areas should be encouraged, and certain areas should be nurtured and grown. While the development of an AI research group is welcome, it should not dominate the Department to the detriment of other research areas.

A programme of regular research seminars by and for postgraduate students should be developed. These students should attend more conferences. The Department should aim to become more visible within UCC, and nationally and internationally.

Income from targeted initiatives should be used to develop a programme for researchers to visit the Department and work there for relatively short periods of time.

Staff development

Currently there is little staff development in the Department.

Some members of the Department have contributed to staff development in UCC by engaging in the delivery of training courses in web-based teaching.

Comment and Recommendations
Academic staff should take part in UCC training courses, and new staff should be particularly encouraged to attend those related to teaching.

CS staff should continue to be at the forefront of initiatives in web-based teaching and learning.

A training budget should be available for the systems support staff. Furthermore, a UCC-wide Group for the systems support staff of all Departments should be set up, to enable these staff to meet regularly and exchange useful information. This group should be initiated by the CS staff.

The induction of new staff, both academic and non-academic, should be undertaken. A system of mentoring of existing and new academic staff is desirable. In particular all

academic staff must be aware of Marks and Standards regulations and their obligations under the examining process.

While it is recognized that some academic staff serve on Faculty and other UCC committees, academic staff in general should become more involved in UCC academic life by taking part in university committees and sharing the administrative and other burdens.

The PRG recommend that a certain amount of money be allocated on a competitive basis from the Department budget for travel.

External Relations

There is little collaboration or contact at the research level between the Department and industry.

There is little research collaboration between the Department and other groups within UCC (such as the School of Mathematical Sciences, Electrical Engineering, Microelectronic Engineering, and the NMRC). The Boole Centre for Research in Informatics (BCRI) will address this to a certain extent.

The degree courses are not accredited by professional agencies such as the IEI.

Comment and Recommendation
The Department should actively pursue research collaborations external to itself, particularly with industry.

The Department should consider acquiring IEI accreditation to increase the attractiveness of its degree.

Support Services

There are recurring problems with certain UCC services. The Buildings Office is often slow to respond to maintenance requests (the PRG were told of a particular 4th-year laboratory that, at the time of the PRG visit, had been without lighting for a week, so the students worked by the light of their PC monitors). The Finance Office does not provide clear and timely information about budget-related items for the Department. The Department is obliged to call on Computer Centre staff for network-related work that its own personnel are qualified to handle (e.g., it does not control its own switches), and this causes unnecessary delays. Finally, the topology of UCC's local area network (where all departments form part of a single LAN) and its low bandwidth (10 Mbit) are unsatisfactory.

The time periods during which staff and students have access to laboratories are very limited. These laboratories are expensive and overused facilities that are currently inaccessible for over 50% of each week.

During the PRG visit to the Library, it was informed about a lack of communication with the Department, despite repeated attempts to make contact. The Department has a significant unspent amount of library money available for book purchases, at a time when the library budgets of almost all UCC Science departments are substantially overspent.

Comment and Recommendations
Improved quality of maintenance of common areas and quicker response to requests for maintenance from the Buildings Office and the Computer Centre are desirable.

Among UCC departments, Computer Science needs exceptional technical and research support from UCC's local area network (LAN). It should be provided with a LAN that is a bridge off the campus LAN and over which it has control in order to facilitate research in areas such as networks and multicast technology.

The time periods during which staff and students have access to laboratories should be extended. This could be facilitated by the introduction of swipe-card access.

The Department should continue to keep its library journal list under review. The external assessors are of the opinion that it does not subscribe to some important journals (such as the *IEEE Journal on Selected Areas in Communication* and *IEEE Personal Communications*) that are relevant to current research in the Department, yet purchases some lesser journals. Furthermore, the Department should ensure that its book purchase allocation from the Library is fully taken up.

Overall Analysis

Strengths of Department

The portfolio of programmes offered is very good. The 3rd-year placement is very valuable. The list of options available to 4th-year students is attractive. The Department has many experienced and skilled staff, and many of these at senior levels. The experience of the students is very positive, reflecting an overall commitment to teaching at all levels.

The Department has been successful in bringing in PRTLI and SFI funding.

Several staff carry out and publish research in international journals and conferences.

The Department has the support of the University management and of the Dean of Science.

The technical systems support is excellent.

Weaknesses of Department

The physical facilities are of an unacceptable standard.

While recognizing that some academic staff have significant records in publication and/or funding, the overall research output of the Department is low by the standard measures of number of graduate students, quality and number of publications, and research income. Little internal clustering or collaboration between members of the Department is evident. Some staff have an isolationist attitude, and apart from the exceptional few, there does not seem to be general commitment to obtaining outside research funding. There is a possible over-concentration on constraints/AI areas of research, compared with the relatively low attention and funding that these areas attract internationally.

The PRG saw little evidence of the Department as a whole being involved in and committed to strategic planning. The PRG did not get a sense of shared vision for the Department among the academic staff.

In terms of research, the Department seems somewhat isolated – from other departments in UCC, from other universities, and from industry.

The external peer reviewers were of the opinion that there is insufficient collaboration with the School of Mathematical Sciences regarding the provision of appropriate mathematical courses, both to support the CS courses and to provide interdisciplinary programmes.

The committee structure of the Department, comprising a large number of small subcommittees with very specific areas of concern, may be inimical to the growth of collective responsibility for its overall development.

Opportunities

Informatics is listed in UCC's strategic plan. Computer Science can capitalize on this by adopting a more outward-looking attitude to research.

The Department has a 30-year track record in producing graduates, who could provide an invaluable network of international contacts and act as ambassadors for the Department.

Current success in attracting funding from SFI and PRTLI could lead to further initiatives in funding.

Enterprise Ireland has identified Cork as a gravitation centre for growing the software industry outside the Dublin Region by building indigenous companies. They have appointed a regional director for Cork. This connection could be exploited with a view to establishing relationships with industry at the research level.

There are excellent opportunities for research collaboration with the NMRC, the Electrical and Microelectronic Engineering Departments, and the School of Mathematical Sciences through the BCRI.

The EU 6th Framework Programme is about to commence, with funding targeted to ICT.

The Atlantic University Alliance framework exists for the development of strategic links with other institutions such as UL and NUIG. Links with CIT could also be developed.

New staff are about to be recruited.

Threats

Possible postponement of the IT building by the government.

Possible failure by the Department to develop a consensus for a compelling vision and strategy. Potential fragmentation of the Department between the large AI/4C group and others.

The present environment, in which substantial research funding is available, could be short-lived.

The number of first preferences in CAO applications has fallen this year. Economic and demographic factors may cause a fall off in student numbers.

Comments on the Self-Assessment Report

A lack of engagement of staff in the quality assurance/quality improvement process was evident. Only twelve staff completed the staff questionnaires, and some of those only in a cursory way. The individual staff profiles often gave inadequate or imprecise information, and in some cases were missing altogether, in spite of the formal requirement that these be provided. Few staff members seemed initially interested in meeting the PRG. The PRG gained the impression that there was a lack of appreciation of the statutory requirement to undergo the Quality Review. The academic members of the Departmental Coordinating Committee were College Lecturers. The PRG did not have the opportunity of meeting any industry representatives or past graduates (apart from postgraduates) of the Department.

Recommendations to UCC

Many of the following recommendations agree with those mentioned in the Department's own Strategic Plan.

- The proposed IT building is critical for the development of the Computer Science Department. UCC should do its utmost to progress this building.

- Among UCC departments, Computer Science needs exceptional technical and research support from UCC's local area network (LAN). It should be provided with a LAN that is a bridge off the campus LAN and over which it has control in order to facilitate research in areas such as networks and multicast technology.

- Departments (in particular, the Department of Computer Science) should be told their finance allocation by the beginning of each academic year, and should know when to expect this cash injection. The present situation ─ in which the academic year is half-over before Departments know their annual allocation ─ is inimical to their efficient management and organisation.

- UCC should carry out a comprehensive review of the administrative support available for the Department.

- The time periods during which staff and students have access to laboratories should be extended. This could be facilitated by the introduction of swipe-card access. These laboratories are expensive and overused facilities that are currently inaccessible for over 50% of each week.

- Improved quality of maintenance of common areas and quicker response to requests for maintenance from the Buildings Office and the Computer Centre are desirable.

Signed on behalf of the Peer Review Group Professor P. Fitzpatrick (Chair)
Date25 April 2002