Quality Assurance / Quality Improvement Programme for Academic Units 2003-2004

Peer Review Group Report for the School of Electronic Engineering and the Research Institute for Networks and Communications Engineering (RINCE)

1 July 2004

Introduction

This Quality review has been conducted in accordance with a framework model developed and agreed through the Irish Universities Quality Board (IUQB) and which complies with the provisions of Section 35 of the Universities Act (1997). The model consists of a number of basic steps.

1. An internal team in the School being reviewed completes a detailed self-assessment report (SAR). It should be noted that this document is confidential to the School and to the Review Panel and to senior officers of the University
2. This report is sent to a team of peer assessors, the Peer Review Group (PRG) – composed of members from outside DCU and from other areas of DCU – who then visit the School and conduct discussions with a range of staff, students and other stakeholders. The membership of the Peer Review Group is given below:

    - Dr. Susan Pulko, Department of Engineering, University of Hull, UK (Chair)
    - Prof. David Wilcox, Department of Electronic Engineering, NUI Galway
    - Mr Tony Herbert, Marketing Manager, Dow Corning Plasma Solutions, Midleton, Co Cork
    - Prof. Jenny Williams, School of Applied Languages and Intercultural Studies, DCU
    - Dr Jean-Paul Mosnier, School of Physical Sciences, DCU (Rapporteur)

3. The PRG then writes its own report
4. The School produces a response, in consultation with the Dean of the Faculty, in response to the various issues and findings of the SAR and PRG Reports.
5. The PRG Report and the School response are then considered at a meeting of the relevant Senior Management of the University (Deputy President, Registrar, Vice-President for Research etc.) who address recommendations in the Peer Review Group Report, that fall outside the control of the School or that require additional resources. Arising from this meeting, School and University based action plans are approved. Together, these are termed the Quality Improvement Plan (QuIP)
6. A summary of the Quality Review is sent to the Governing Authority of the University, who may approve publication in a manner that they see fit. Following the approval of the summary report by the Governing Authority, it is published on the University website. The full text of the Peer Review Group Report is also published on the Quality Promotion Unit website.

The present document is the report referred to in Step 3 above.

1. Profile of the School

Location of the Unit

The School of Electronic Engineering and RINCE occupy most of the Research & Engineering Building – the S building (opened 2002)- and a large part of the Physics & Engineering Building -Block2 or N building (opened 1993).

The S building houses the academic staff offices, the administrative and technical staff, 13 research laboratories, 4 undergraduate teaching laboratories, 3 taught postgraduate teaching laboratories and 2 laboratories for technical support.

The N building houses 3 research laboratories, 1 laboratory for commercial research (PEI Ltd), 5 undergraduate teaching laboratories and 1 laboratory for technical support.
The School of Electronic Engineering and RINCE occupy 2259.5 m^2 and 1607.6 m^2 of floor space respectively spread over these two buildings.

Staff

The current (March 04) staffing comprises
22 permanent Academic Staff,
1 full-time contract lecturing Staff,
10 part-time contract lecturing Staff
1 contract Research Officer (RINCE),
2 permanent Analyst Programmers,
5 permanent and 1 contract Technical Staff,
2 permanent and 2 contract Administrative Staff .

Programmes/Outputs

The School is solely responsible for 4 undergraduate programmes, the Common Entry into Engineering first year programme (CECE1), 7 taught postgraduate programmes and jointly responsible with the School of Mechanical & Manufacturing Engineering for 1 undergraduate programme (Mechatronic Engineering)

Programme of Study (Taught)	Total Student Number 2004
B.Eng. in Digital Media Engineering (DME)	57
B.Eng. in Electronic Engineering (EE)	113
European B.Eng/M.Eng. in Electronic Systems (ES)	11
B.Eng. in Telecommunications Engineering (TC/ICE)	22
jointly B.Eng in Mechatronic Engineering (ME)	132
Common Entry into Engineering (CECE1)	14
M.Eng. in Electronic Systems	58
M.Eng in Telecommunications Engineering	60
Remote Access to Continuing Eng. Education (RACeE)	3
Graduate Diploma in Electronic Systems	15
Graduate Diploma in Telecommunications Engineering	26
Graduate Cert. in Electronic Systems	1
Graduate Cert. in Telecommunications Engineering	1

The academic staff have strong involvement in research and the School is home to large numbers of students working for the award of Master and PhD degrees by research.

Programme of Study (Research)	Total Student Number 2004
M.Eng. in Electronic Engineering	42
Ph.D. in Electronic Engineering	30

2. The Self-Assessment Process

The Co-ordinating Committee

Dr. Martin Collier	Senior Lecturer (chair)
Prof. David Cameron	Associate Professor
Mr. Jim Dowling	Head of School
Ms. Tanya Keogh	Faculty Office representative
Mr. Karol Kowalik	Research student
Mr. David Molloy	Analyst/Programmer
Dr. Valentin Muresan	Post-doc
Prof. Charles McCorkell	Professor
Prof. Patrick McNally	RINCE Director
Mr. Paul Wogan	Senior Technician

Methodology Adopted

The committee was appointed by the Head of Electronic Engineering in 2003. Its first meeting was held on 20th May 2003, when the main item on the agenda was the nomination of candidates for the peer review group. Subsequent meetings were held on an ad-hoc basis until the volume of work required that weekly meetings be instituted in October 2003. The committee chair also met regularly with the Head of School and the RINCE director. He attended one meeting with representatives of the Registry regarding the collection of statistics and kept the Quality Promotion Unit informed of progress by telephone.

Members of the committee were nominated as “custodians” of various sections of the self-assessment document, and they would conduct meetings with relevant staff members. Other staff were informed of progress, requirements, etc. via email (as is normal practice in the School and RINCE) and informally, at the water-cooler, etc. Relevant issues were also raised at plenary and standing committee meetings of RINCE.

An “away day” was organised for the 5th of February 2004, which was attended by virtually all School and RINCE staff, and this was used to address many outstanding issues in the self-assessment document, and was also an opportunity to discuss strategic matters.

The self-assessment document was collated and edited by the committee chair.

3. The Peer Review Group (PRG) Process

Overall Comments on the Visit

The DCU Quality Promotion Unit provided entirely adequate information for the PRG at all stages of the process. Both the documentation supplied prior to the visit and the initial briefing by the Director of Quality Promotion proved extremely useful as they pointed out to the PRG the important points it should consider in its report. The schedule of visits and meetings organised by the QPU was excellently planned, well balanced and provided the PRG with the information needed to get a full picture. The liaison provided by the School/RINCE during the visit was first-class and the PRG would like to sincerely thank all the staff who engaged at any level in this arduous process.

Methodology

The Review process consisted of three distinct activities.

1. Familiarisation with the self-assessment report prior to the visit.

2. The site visit per se. It was conducted over a three-day period. Its main purpose is to review and validate the main points of the self-assessment report by conducting directed interviews of relevant personnel/stakeholders and by inspecting/evaluating the research, teaching and general facilities. The members of the PRG decided to stay together at all stages of this visit. The PRG Chair conducted all the meetings and invited the other PRG members to ask questions and take part in the conversation if they wished. Each member of the PRG decided, at their first meeting, to concentrate on particular aspects/topics of the assessment process.

- Dr Pulko (Chair): Financial support and quality of student experience; General undergraduate and postgraduate issues; Programme Reviews; Student employment.
- Prof. Wilcox: Quality and quantity of research output; Training of PhD students; Quality of management of research structures.
- Prof. Williams: All Financial aspects; Standing and interaction of School within DCU; All aspects of taught postgraduate programmes.
- Mr Herbert: Exploitation of research and entrepreneurship; Degree standards; Industry/INTRA programme; Critical mass of student body; Marketing and stakeholders.
- Dr. Mosnier (Rapporteur): All above topics; Minutes/Note taking

3. The writing and editing of the present review report which summarizes the main findings of the PRG and makes recommendations for future developments was undertaken as follows: the initial sections were written by the rapporteur while all the PRG members contributed to Sections 4-6 concentrating broadly on the aspects listed above. The main sources of information used to produce the report were the School self-assessment report and the notes taken during the visit.

Site Visit Programme

Day 1 (Wednesday 24th March 2004)
14.00 – 15.30: Meeting of members of Peer Review Group and briefing by Director of Quality Promotion
16.00 – 17.30: Meeting of Peer Review Group with School Quality Co-ordinating Committee
19.30 – 22.30: Meeting over dinner with Head of School, and other members of School Committee and RINCE staff

Day 2 (Thursday 25th March 2004)
09.00 – 09.30: Meeting of PRG with Vice-President for Research.
09.30 – 12.00: Consideration of self-assessment report and meeting with selected School Staff
12.00 – 13.00: Visit to core facilities of School (research and teaching labs)
13.00 – 14.00: Discussion with Director of Quality Promotion over working lunch
14.00 – 18.00: Meeting with employers, postgraduate and undergraduate students, and recent graduates.
18.00 – 18.30: Meeting of Peer Review Group

Day 3 (Friday 26th March 2004)
09.00 – 09.45: Meeting of PRG with DCU Senior Management -President, Deputy President, Secretary, Director of Human Resources and Director of Finance-.
10.00 – 11.00: Private meeting of PRG to discuss outcome of previous meetings and prepare for next meeting (instead of visit to O'Reilly Library and visit to lecturing facilities)
11.00 – 12.30: Meeting of PRG with Head of School for further questions and clarifications
13.00 – 16.00: PRG discusses aspects of its main findings and recommendations and prepares Exit presentation
16.00 – 16.30: Exit presentation by Chair of PRG to all School/RINCE staff.

Overview of the Site Visit

The PRG was impressed by the candidness and the quality of the responses from all the parties it met. The following paragraphs echo the views of staff and stakeholders and summarize the main outcome of the discussions that took place during the site visit.

(a) The self-assessment report was considered by the PRG in the presence of all the members of the School Quality Committee. The Head of School first gave a brief history of the generation of the self-assessment report. In a "question-and-answer" session, the unique position of RINCE –an interdisciplinary grouping- at the core of the School's research, was explained and related issues clarified. The drastic reduction in Electronic Engineering student numbers in recent years was discussed and current and future solutions to this critical problem were examined. The current strength of the taught masters programmes was commended, although the School sees the budgetary process in relation to the corresponding fees as an issue.

(b) The PRG met individually with the Vice-President for Research (VPR), Prof. Dermot Diamond. The VPR gave a brief overview of the history of the PRTLI programme and the establishment of RINCE as part of Cycle 1 of PRTLI. He explained the present process of direct allocation of a recurrent budget to RINCE from the DCU budget. He clarified the current Office of the VPR (OVPR) policies on redistribution of research grant overheads and pointed out that DCU's is the most "generous" by redirecting 30 % of the

total overhead to the researchers themselves. He emphasized the current excellent funding opportunities offered by the Information and Communications Technology programme of Science Foundation Ireland (SFI) and the appointment of a Research Officer to help RINCE capitalize on these and other external funding opportunities.

(c) The PRG considered more specific aspects of the self-assessment report with staff representatives in the three following categories:

- Teaching & Learning: The group elaborated on School teaching strategies and the predominance of lecturing as a delivery mode. The success of School lecturers in winning funds from the ODTL for innovative teaching projects was emphasized. Multidisciplinary projects are not often used but are very popular (e.g. LEGO robots). Supervision issues of individual versus group projects were discussed. New teaching products (e.g. B. Eng. in Digital Media Engineering) evolve from staff research rather than market surveys. Improvements for new courses emanate from informal/anecdotal feedback from students and employers/industrialists. Currently available mechanisms for the assessment of teaching quality and their effectiveness were discussed. The training of laboratory demonstrators is rather poor and left up to individual lecturers.

- Research & Scholarship: Research students are encouraged to complete PhDs rather than Masters, however, average duration of ~ 5 years is long. Quality target for PhDs is not well defined; it should be based on publishable quality, i.e. minimum number of journal papers. This is reflected in the quite low average of ~ 1 journal paper/per staff/per academic year. However, there are specificities in this respect, as the research carried out by some groups is preferably reported in international conference proceedings. To improve this situation, the School and RINCE suggested that a University-mediated scheme should be implemented to secure costs for secondment of faculty for specific periods of research activity. External funding opportunities were discussed in the general context of RINCE's funding. Established DCU support structures for research (OVPR – FP VI support-, Finance Office, Human Resources) are described as ineffective by staff. Other forms of support from DCU were suggested and could take the form of a start-up company or the appointment of a full-time, permanent marketing person.

- School Organisation: Increased administrative loads due to multiple administrative offices are a matter of concern. New Faculty of Engineering and Computing has been a radical change from previous structure, which takes some getting used to. DCU management's repeated failure to appoint an Executive Dean is a serious problem, as the Faculty is not represented at Executive. Location of the Faculty Office is an issue as the faculty is spread over two centres. As Engineering and Computing have different ethos and specific needs, this makes it difficult for the faculty office to function according to a unified model. Career Structures in DCU is a problem for all categories of staff. The fixed 60:40 junior:senior academic staff ratio, in particular, is seen as a serious threat for the School. Budgets for Schools are agreed by the Executive Dean and Heads of Schools, which provides for some autonomy. However, Budget Committee should consider various models for managing budgets. In particular, School should have some form of control over the income generated by fees.

(d) Meeting with employers/industrialists:

DCU's INTRA students are highly regarded by employers and are rated better than students from other universities because of their practical experience. This enables them to settle into the job more quickly, although such differences grow less important over

time. Their oral communication skills are excellent but employers identified English-language writing skills, particularly in the presentation of projects, as an area where some improvement could be made. Employers saw competence in mathematics as key to maintaining the highest standards in Engineering. They see the current unfavourable employment situation as due to temporary macroeconomical problems. This situation is likely to reverse with improving economic conditions.

(e) Meeting with students

- 1st, 2nd, 3rd, 4th year undergraduates: *Why come to DCU?* New College; convenient location; Mechatronics unique in Ireland; INTRA programme; Open Day; DCU's reputation "outside"; DCU's modern image. *What's best in course?* Labs and practical aspect; assessment not all exam based; good mix of subjects in ME and DME; great computing facilities. *What's worse and what would you change?* Accents of some lecturers/tutors/demonstrators difficult to understand; Labs too long; Too much pressure; Not enough help during labs; Too many students in labs; Introduce more project work; Do not drop maths and physics; No information on report writing; No feedback on reports; More telecom stuff in Telecom Eng.; More Java and C++ programming; Shouldn't be obligatory to accept INTRA placement.
- Taught Postgraduates: *Why DCU?* Become more marketable after losing job twice; Strengthen DCU or UL B. Eng. degrees; Learn new stuff after 20 years in job; International experience. *What do you like?* Highly motivated staff; Lastest technology is taught; Broad coverage of topics; Increase prospects of a good job. *What would you change?* Not much!; Audio support would help greatly; shorten long 3-hour lectures.
- Research Students: All really like their research; all very impressed with RINCE's facilities; all find RINCE's research of high standard.
- Recent graduates: All enjoyed their DCU experience and found it important in securing an engineering job in unfavourable employment conditions.

(f) Meeting with DCU Senior management: During this brief meeting, the PRG, in the light of the discussions that took place the day before, raised the following issues

- Lack of depreciation policy for capital equipment,
- Redistribution of overheads on research grants,
- Recurrent funding for RINCE,
- Appointment of an Executive Dean for the Faculty of Computing and Engineering,
- Promotion policies in DCU and the "60:40" rule,
- Staff teaching training,
- Sharp decline in number of engineering students at undergraduate level.

(g) Due to pressure of time, PRG cancelled the scheduled visit to the O'Reilly library, the meeting with the subject librarian and the visit to the lecturing facilities.

Review Group's view of the Self-Assessment Report

The PRG found the self-assessment report to accurately represent all the aspects of the work carried out by the School/RINCE, including a candid analysis of its strengths and weaknesses. There were no significant omissions in the report and a separate volume of appendices provided useful supplementary information, e.g. the 1995 School Plan. The PRG requested some extra information such as External examiner reports or the minutes of Programme Board meetings, which the School provided without reserve.

4. Findings of the Review Group

Background and Context

The School of Electronic Engineering at DCU (then NIHE, Dublin) enrolled its first 48 students in 1980 on its initial undergraduate programme, the BEng in Electronic Engineering. A BEng in Telecommunications Engineering degree was inaugurated in 1990, the first such programme in Ireland. A taught postgraduate programme was also introduced in 1990. Remote Access to Continuing Engineering Education (RACeE) was piloted in 1995. This was one of the earliest initiatives of its kind in Europe. The BEng in Mechatronic Engineering was introduced in 1996, jointly with the School of Mechanical and Manufacturing Engineering. A novel 5-year (4+1) BEng/MEng in Electronic Systems programme was introduced the same year in collaboration with the DCU Business School and the School of Applied Language and Intercultural Studies. A new undergraduate BEng programme in Digital Media Engineering had its first intake of students in 2001. Postgraduate teaching was also significantly expanded that same year. The annual number of graduates of bachelor degree programmes rose from 27 in 1984 to a peak of 120 in 2002.

Research has grown in importance in the School's activities throughout the 1980's during which period significant funding was secured via the nationally-funded Programmes in Advanced Technology (PAT) and from various European programmes. National recognition of the School's research capability was given when a major government research funding initiative (The Programme for Research in Third Level Institutions – PRTLI) funded the formation of the Research Institute for Networks and Communications Engineering (RINCE) (1999/2000). RINCE's foundation was the combined strengths of well-established research groups within the School (TELTEC, Vision Systems, Microelectronics and Materials, Broadband Switching, Radio Frequency and Optical). The funds secured were instrumental in financing the new Engineering and Research building which the Faculty of Engineering occupied first in Sept. 2002. The School had graduated a total of 29 doctoral candidates through Nov. 2003.

The School currently focuses its research activities into three main thrusts: Telecommunications & Signal Processing, Microelectronics & Materials and Systems & Control. Staff members are active in a number of the following centres: PEI Technologies (formerly Power Electronics Ireland), a Government sponsored Programme of Advanced Technology (PAT); the Centre for Digital Video processing (CDVP) – a collaboration between the School of Computing, the School of Electronic Engineering and RINCE, it was awarded "University Designated Research Centre" status in 1999; the National Centre for Plasma Science & Technology (NCPST), whose focus is on fundamental and applied plasma research; the Research Institute in Networks and Communications Engineering (RINCE), which is one of the initiatives funded under the Higher Education Authority's (HEA) Programme for Research in Third Level Institutions 1999-2001. RINCE is a national centre for excellence in information and communications technology. It is based in the School of Electronic Engineering at DCU.

Organisation and Management of the School/RINCE

The School of Electronic Engineering is led by a head, appointed by the University, who acts as the 'line manager' of all staff in the School. The only other 'line manager' within the School is the Senior Technician, in charge of the staff of five (other) technicians. The Head is solely responsible for managing the resources of the School and leading it academically, administratively and strategically. He/she currently reports to the

President. The role of the Head of School is likely to change substantially when an Executive Dean is appointed.

The Head is supported in his role by a number of committees and ad hoc working groups, convened as required. These are the Senior Staff Consultative Group, the School Committee, the Research Committee, the Faculty Administrator and Faculty Office, Others. Current management structures in the School are working satisfactorily, and it is not considered that major changes are needed.

RINCE's Director is supported in the day-to-day operation by the staff and operational functions are carried out through an Administrator and a Secretary. He represents RINCE within DCU and externally, and co-ordinates the dissemination of research output. He is assisted by a Research Officer, who works in liaison with current researchers on developing future research and funding initiatives, developing commercial R&D and managing current and future research administration. In the responsibility for the business of RINCE the Director is assisted by a Steering Committee. The issues for deliberation, decision, advice and action include for example, strategic directions, standards, project planning and management procedures, project control/monitoring, project evaluation, applications for funding, management of existing funding, allocation of resources, recruitment and management of researchers.

The current RINCE management structure is working well with advantages of broad consultation through the steering committee, unambiguous accountability and speed and directness of action. However, as the Institute grows, the 'start-up' management structure may well need revision which will need to be based on the widest consultation to ensure long-term commitment of researchers to the Institute based on recognition of and participation in its key drivers of synergy (particularly through cross-disciplinary research), cost effectiveness (through shared facilities) and critical mass (particularly in terms of European level credibility). Whatever structures are put in place should place a premium on the ability of researchers to direct the focus of the Institute, albeit in light of the needs of stakeholders such as industry, the University and the State as revealed, for example, by informed market guidance. However, the RINCE management model may need to be reviewed to distinguish between day-to-day management decisions, tactical issues and strategic planning. Any changes will need to recognize the voluntary nature of the participation of researchers in RINCE.

The School and RINCE need to improve their marketing. This is particularly important for providing long-term strategic direction at several levels – teaching program design, R&D program guidance, exploitation of R&D output, location of external funding, raising of profiles nationally and internationally and enhancement of School profile in undergraduate entrant catchment areas. The welcome appointment of a Research Officer by RINCE funded by the University has addressed the important external funding marketing issue. It is recommended that the funding for this appointment be extended to the long term. Development of a costed plan to put in place a marketing process as a permanent component in the School's and RINCE's strategic development should be done and could be carried out in parallel with an external benchmarking of RINCE (recommended in section 6 post). The terms of reference of any marketing plan development initiative will need careful definition and the party selected to carry out same should have technical and/or industrial qualifications that are specifically aligned with the School's activities in addition to marketing credentials.

Programmes and Instruction

The group found that facilities for teaching were excellent, although it would be beneficial to have a concourse area in which students (and staff) could meet informally The School offers a good range of high quality undergraduate and postgraduate programmes of study, the Masters' programme and the INTRA scheme being particularly praiseworthy. This was confirmed in the recent accreditation submission. Student achievement is good. The School staff are, in general, highly motivated and enthusiastic where teaching is concerned.

The panel spoke with students from each year of study and with several who had recently graduated. The vast majority were very supportive of the School and DCU as a whole. However, several students independently mentioned that teaching skills 'at the chalk face' are variable and this suggests that some form of training in teaching skills would be advantageous. Such training, both for recently appointed academic staff and as part of ongoing staff development is the norm in some countries.

It is clear from the minutes of meetings as supplied to the PRG and from the student evaluation exercise that the department responds to student feedback. However, feedback, both negative and positive, should be more actively solicited via the establishment of a specific School committee. Means should also be established for 'closing the loop' by keeping students informed of actions taken and changes made.

Perhaps not surprisingly, employers place enormous value on oral and written communication skills and this is an area of curriculum, which could be enhanced and extended. Students need to be directly taught how to make oral presentations before actually doing so for assessment. They also need explicit feedback on their written work if their presentation skills are to be developed efficiently.

The School recruits the vast majority of its undergraduate students from its own locality. In this context recruitment is difficult and it is likely that the high numbers of MEng students is the result of graduates' finding difficulty in securing work they feel appropriate in the current economic climate. It is, therefore, essential that the current gearing of fee income be maintained. In the longer term the School needs to increase its penetration of its geographical catchment area and, if possible, expand that area which might mean widening participation into new socio-economic groups in neighbouring geographical areas. It would also be appropriate for DCU to target a small number of regions for overseas recruitment, although the market is an international one and is well colonised by other institutions particularly in English speaking countries.

Scholarship and Research

The amount of research activity in the School of Electronic Engineering is commendable. The establishment of RINCE as part of cycle 1 of PRTLI is a particularly noteworthy achievement that has had a major impact on the growth of research activity in recent years. Sixteen of the 23 permanent academic staff in the department are affiliated to RINCE which gives RINCE a wide range of expertise on which to draw. This alliance of staff and associated research groups has clearly been highly successful.

The research output and activities of RINCE since its establishment are impressive and exemplary. The winning of Euro7.6 million of external funding, to date, to finance these activities deserves note and much credit to the personnel of RINCE.

The long-term viability of RINCE is, however, dependent on long-term financial support, which is uncertain at this time. Given that RINCE is a major contributor to the research

output, the School is clearly vulnerable should adequate support fail to be forthcoming. This is an issue that needs to be addressed as a matter of urgency within the framework of an overall research strategy.

The PRG was informed that the Management of RINCE is under review. The school in general, and RINCE in particular, did not seem to feel that the University was as supportive as it would have liked in providing institutional support for research developments. There was a perception that the University Offices might not have pressed as hard as it might for continued Cycle 2 PRTLI funding for RINCE, NCSR & NCPST or for State subvention for DCU National Centres on the lines enjoyed by NMRC. Recurrent funding, as already noted, is a matter of grave concern.

The school expressed some dissatisfaction with the current University policy on the distribution of “overhead” funding from research contracts, feeling that it acted as a disincentive to researchers to affiliate to RINCE and that the policy should be revised.

The alliance that is RINCE has worked well but does not preclude other alliances forming to attract new SFI funding in the general area of ICT (one of the currently favoured areas for SFI support). Another favoured area is Biotechnology. There would appear to be a sufficient range of expertise in the school to think of targeting an SFI award in the biomedical field although it is noted that DCU is at some disadvantage in not having a medical faculty.

Research student numbers are impressive, with 30 PhD students and 42 MEng students registered in 2004. There is, however, concern that the time taken for some students to complete their research degrees has been rather too long (an average of about 5 years for a PhD). At present there is no formalised instruction given to postgraduates on matters such as defining milestones, time management and research technique. Review of progress, beyond first year, is informal.

The PRG approves the move to attract PhD students rather than Masters students. It was stated that there was an expectation that the work of each PhD student would result in 1-3 journal publications but there is no stated means for assuring this quality target.

The PRG was impressed with the John Holland Scholarships scheme for encouraging undergraduates to continue, on graduation, as postgraduate students.

Research output, as measured by publications, is good by national standards. There were some 143 articles published in refereed journals over the five-year period 1997-2002. Given an average of circa 23 academic staff (assistant lecturer and above) over the same time period, output works out at about 1.25 refereed papers per academic staff member per annum. Whilst good by national standards, this indicative figure suggests the need for measures to further increase journal paper output to measure up to high international standards.

The research laboratories and research student accommodation were found to be spacious and of a high standard. Thus, at the present time, there would appear to be no space impediment to increasing postgraduate numbers.

There is, however, no ongoing funding to cover capital depreciation/replacement of the current stock of equipment. The ability of the School and RINCE to deliver research output at the current high level is contingent on such funds being forthcoming.

Social and Community Services

The School has no formal policy regarding contributions to the University other than to encourage staff to respond positively to requests from the University. Over the years, faculty have served on various DCU or School Committees such as the Library Committee, Academic Council, Standing Committee of Academic Council, DCU Health & Safety Consultation Group, Research Advisory Panel, Management Committee of NCPST, DCU Strategic Plan group, University Disability Steering Group (chair). One academic staff member has recently completed a five-year term as DCU Dean of Teaching and Learning. In this role, he served as a member of Executive, Academic Council (and Standing Committee), Validation and Accreditation Committees and Quality Committee.

The School is supportive of efforts by staff to contribute to the wider community but has no formal policy in this regard. The School has been actively involved in providing visits and presentations to secondary schools in its catchment area for the past 10 years. In doing so, it has built up contacts and links with various schools and guidance counsellors. For the most part, the School maintains these links outside of the University's Schools Liaison Programme but communicates any visits or activities to the coordinators of the liaison programme. Any requests for staff or cooperation for events organised by the Liaison Programme are always met. Adequate resources are always provided for any University-organised promotions, as the School is very interested in the promotion of electronic engineering to secondary school pupils.

The School is eager to educate all secondary school students about electronic engineering and to advise them on potential career prospects for those graduating from the School's programmes. The School does not target Transition year students specifically but includes them in any promotions undertaken by the School. In addition to the University-led activities, these include

- school visits to secondary schools,
- the participation at engineering road-shows (the STEPS initiative), organised in conjunction with the Institute of Engineers of Ireland (IEI)
- the holding of an annual 'Career in Engineering' workshop.

Staffing, Accommodation and Resources

Staff in the School have an appropriate range of expertise and the age profile is satisfactory. The gender balance of staff, with women in secretarial, administrative and junior academic posts and men in the technical, (some) junior academic, (all) senior academic and research posts, is regrettable but a reflection of society as a whole.

The School of Electronic Engineering has met the DCU target of 60:40 set for the Junior:Senior staff ratio. While this is commendable in itself, it does mean that there is little prospect of promotion for junior members of staff. This in turn could have serious consequences for staff motivation and retention. The lack of a career path for technical staff is another issue of concern.

The School took possession of a new, state-of-the-art Research and Engineering building with an impressive IT infrastructure in 2003. It also has accommodation in the Physics and Engineering building. The accommodation is modern, spacious, bright, airy and generally attractive. The Head of School indicated his intention of enhancing the public areas in the new building with more facilities for students.

The School is funded by a pay (92%) and non-pay (8%) budget. The current budget mechanism is based on student credit registrations and is a system which rewards taught postgraduate programmes and research students. The School is well placed to benefit from this. In addition, research funding is provided by the University in two ways: firstly by an annual grant from the Budget Committee which the School uses to fund the research of members of staff; secondly through the monies allocated on a competitive basis by the Research Advisory Panel to both individual members of staff as well as to research centres such as RINCE. RINCE, like other research centres in the University, is expected to be largely self-financing and generated, together with the School, a total research income of €12,258,433 between 1997 and 2003.

The School has recently undertaken a staff survey of the services it receives from the central units in the University. These services were then ranked for Quality from 10 (highest quality) to 1 (lowest quality). The staff declared themselves most satisfied with the service they received from the Library and least satisfied with the service they received from the Finance Office. They rated the new Faculty Office extremely highly.

5. Overall Analysis of Strengths, Weaknesses, Opportunities and Concerns

Organisation and Management of the School

- *Strengths*
  - Collegial
  - Distribution of resources and facilities
  - Career start management
  - Open to ideas and innovation from within
  - Skills to management programmes

- *Weaknesses*
  - Lack of strategy (non-strategic)
  - Collective political position within DCU
  - Lack of organisational structure (+ meetings)
  - Marketing and promotion
  - Staff retention (promotion etc.)
  - Distribution of tasks
  - Proliferation of duties – increased administration of programmes
  - Relationship within faculty

- *Opportunities*:
  - Opportunity for the School to review its structure and to align it with the new faculty structure
  - Opportunity in line with the new faculty structure to delegate tasks
  - Opportunity for the Faculty to pool resources in certain areas to free up more time for research and other activities
  - The devolution of authority in certain areas from the centre to the faculty should provide an opportunity for speedier decision-making, and greater influence for the School in the decision making process.
  - New DCU performance management systems gives an opportunity to identify training and development needs, career planning and to provide feedback for staff

- *Concerns*:
    - Lack of an Executive Dean – the Faculty is not represented on certain University Committees
    - The role of the Head of School is not clearly defined in the new faculty structure
    - Research Centres Directors report to the Executive Dean in the new structure
    - Competition between Schools in the faculty in terms of students and resources
    - Collegiality – "sometimes activities fall through the hole" when tasks are not clearly assigned to an individual
    - Insufficient promotion of the School both internally in DCU and externally
    - The non political nature School in DCU
    - Decreasing university finances
    - Lack of financial information for forward budgetary planning
    - Little forward planning
    - Staff retention
    - Little direction or guidance for new administrative staff in particular

<u>Programmes and Instruction</u>

- *Strengths*
    - INTRA programme
    - Motivated Staff
    - Excellent teaching facilities.

- *Weaknesses*
    - None

- *Opportunities*
    - Overseas student recruitment
    - Increase penetration of current geographical catchment area
    - Target new geographical areas in Dublin in regions where educational horizons are currently limited.

- *Concerns*
    - Difficult recruitment
    - Poor employment prospects, currently
    - A small amount of less than satisfactory teaching, and no expectation of initial training or ongoing staff development in teaching methods.
    - No established and dedicated forum for collecting student feedback and discussing improvement with students.

<u>Scholarship and Research</u>

- *Strengths*
    - Availability of good quality research laboratory space
    - High standard of specialist research equipment
    - Complement of highly-qualified academic staff
    - Good coverage of ICT expertise amongst staff
    - RINCE as a research hub

- *Weaknesses*
    - Limited full-time research posts
    - Lack of expertise in *rf* wireless communications hardware
    - Poor service from OVPR

- *Opportunities*:
    - Availability of SFI funding in ICT
    - Further inter-disciplinary collaboration

- *Concerns*:
    - Financial uncertainties facing RINCE
    - Reducing pool of DCU graduates
    - Pressure to reduce number of academic staff posts
    - Depreciation of Capital Equipment

<u>Staffing, Accommodation and Resources</u>

- *Strengths*
    - Well-qualified and dedicated staff
    - A state-of-the-art building, equipped to a very high standard
    - A budgeting mechanism that rewards postgraduate taught programmes and high numbers of research students.

- *Weaknesses*
    - Difficulty of promoting junior staff now that the Senior:Junior ratio has been achieved.
    - Lack of career path for technical staff
    - Difficulty of funding capital equipment
    - Delivery of some services from central University units, notably the Finance Office

- *Opportunities*
    - Use new facilities to attract more postgraduate/research students
    - Use new facilities to attract previously under-represented groups such as school-leavers in the North Dublin area.

- *Concerns*
    - In the medium- to long term, maintenance of new building and depreciation of equipment and facilities.

6. Recommendations for Improvement

Organisation & Management

- **P1U** Continue to support the School's success in student recruitment in the face of fluctuating undergraduate demand by continuing the current capitation funding policy placing a premium on postgraduate courses and research.

- **P1U** End the discrimination against part time, e.g. industry release, degrees by placing them on the same footing as full time students with regard to fees.

- **P1U** Urgently appoint an Executive Dean of the new Engineering and Computing Faculty and complete Faculty reorganisation.

- **P3S** Explore methods for effectively expanding the School's catchment area, e.g. subsidised transport, focussed accommodation.

- **P3S** Increase penetration of local catchment area through a long-term programme of promotion in the local schools.

Programmes and Instruction

- **P1SFU** Develop strategy for improving student recruitment, especially locally and nationally.

- **P1S** Give feedback to students on their written work.

- **P1SFU** Develop training in teaching methods for both new and existing staff.

- **P3S** Establish a committee to actively solicit feedback from students on their learning experience and develop mechanisms for 'closing the loop' in response to such feedback.

Research and Scholarship

- **P1S** Prepare executive document for discussion with OVPR and Senior Management regarding the financial responsibilities of the University in relation to RINCE.

- **P1SU** Engage with OVPR with a view to an interactive understanding of its role and what it can and cannot do to support research projects administratively in a timely and efficient manner.

- **P1S** Establish an internal forum to discuss ways and means of attracting further substantial funding from SFI

- **P1S** Perhaps through the new Faculty Research Committee, establish procedures for training postgraduate students in research skills and for monitoring progress. Set clear targets for completion times. The PRG recommends a minimum of 2 peer-reviewed journal papers coming out of each PhD.

- **P2S** The school should establish clear targets regarding output of peer-reviewed journal papers by staff members. For multiple authorship, a method should be defined for evaluating an individual author's contribution. It would be helpful to obtain agreement with management for norms for research output expected for each grade of promotion bypassing strict adherence to the 60/40 rule.

- **P1U** Develop a policy accounting for capital depreciation of equipment and infrastructure with concomitant funding. This should be backed by DCU and become a policy priority.

- **P2SU** It would be helpful to obtain agreement with the University management team on norms for research output expected for each grade of promotion in the Faculty. The idea would be to reward merit as an improvement on strict adherence to the 60/40 rule.

- **P1SU** Every effort should be made to improve the marketing of RINCE. External benchmarking against EU standards for strategic research centres is one possibility.

<u>Staffing, Accommodation and Resources</u>

- **P1U** In conjunction with other Schools which have also achieved the 60:40 Junior:Senior ratio, agree with HR a transparent procedure whereby deserving junior staff can be promoted.

- **P1U** Enter into a dialogue with the Finance Office to improve the service provided to the School.

- **P1U** Retain the current mechanism for setting School budgets in the University.

- **S1U** Enhance the new Research and Engineering Building by providing some seating, refreshments and plants in the public areas.

- **P2U** Explore with SIPTU and HR the possibility of developing a career path for technical staff.

- **P1U** Assist the recruitment and retention of excellent staff by moving urgently towards a merit based staff promotions policy to replace the current senior to junior staff ratio restriction.

- **P1-U** Develop a scheme whereby excellent technical support staff can be integrated into a research-oriented career if so desired