

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



Quality Improvement Plan  
for the School of Electronic Engineering  
RINCE

25 January 2005

Peer Review Group (PRG) visit	24-26 March 2004
Final PRG Report received	1 July 2004
Unit Quality Improvement Plan received	8 September 2004
Follow-up Meeting held	8 December 2004

## Follow-up Process

- Following receipt of the finalised peer review group report on 1 July 2004, the Director of Quality Promotion sent copies to:
  - the Head of School, who ensured that a copy was made available to all members of staff and informed the School of the requirement to produce a unit response (in consultation with the Dean of the Faculty of Engineering and Computing)
  - the President, other member of Executive and the Quality Promotion Committee
- The Head of School sent the School (and Faculty) Response to the Director of Quality Promotion on 8 September 2004.
- The Director of Quality Promotion convened a follow-up meeting on 8 December 2004 which involved the following participants:
  - *Representing the Quality Promotion Unit*
    - Dr Pdraig Walsh (Chair)
  - *Representing the School*
    - Mr Jim Dowling (Head of School)
    - Dr Martin Collier
  - *Representing the Faculty*
    - Prof. Charles McCorkell (Dean)
  - *Representing Senior Management*
    - Mr. Martin Conry (in place of the Deputy-President)
    - Prof. Eugene Kennedy (Vice-President for Research)
  - *Representing the Peer Review Group*
    - Prof. Jenny Williams (SALIS)
- Following the above meeting, the Quality Improvement Plan was drafted and sent for consideration by Executive on 25 January 2005
- Following approval of the Quality Improvement Plan, the Director of Quality Promotion will prepare a summary report incorporating the Peer Review Group Report and the Quality Improvement Plan for consideration (and approval) by the Governing Authority on 10 February 2005
- The Peer Review Group Report, the Quality Improvement Plan and the Summary Report to Governing Authority will then be published on the university website.

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## 1. INTRODUCTION

### 1.1 Background and Context

As part of the University's Quality Review process the School of Electronic Engineering/RINCE undertook a comprehensive self-assessment over the period May 2003 to February 2004. In March 2004 the School and RINCE's Self-Assessment Report was completed and submitted to the Quality Promotions Director. The Quality Review of the School and RINCE followed when this report was presented to the appointed panel of peer assessors, the Peer Review Group (PRG) who then visited the School/RINCE to discuss the report and explore its content and the operations of the School and RINCE in greater detail by meeting at length with all the School and RINCE's stakeholders. The PRG then produced its report (REF) to the University.

### 1.2 School of Electronic Engineering/RINCE Quality Improvement Committee

The PRG Report was sent to the Head of School (Mr Jim Dowling) on 6<sup>th</sup> July 2004. Returning from 2 weeks vacation, he sent it to all School staff on 19<sup>th</sup> July 2004 and it was discussed briefly at a School meeting held on 5<sup>th</sup> August. A Quality Improvement Committee (QIC) was established with essentially the same membership as the original Quality Review Co-ordinating Committee.

It was decided to form a smaller working group within that Committee consisting of:

Mr. Jim Dowling (Head of School)	with a School Management/Organisation/Administration/Resource brief.
Prof Patrick McNally (RINCE)	with the brief to deal with School Research issues.
Dr Barry McMullin (replacing Prof C. McCorkell, recently appointed Executive Dean of the Faculty of Engineering & Computing)	to deal with Education (Teaching and Learning) issues.
Dr Martin Collier (Chair, Quality Review Co-ordinating Committee)	to continue in his role of Chairman and document co-ordinator.

This group's task was to assemble all relevant sections of all relevant reports, integrate and edit these and produce a first draft of the consolidated School of Electronic Engineering/RINCE Quality Improvement Plan.

This draft was then considered by the other members of the QIC whose comments and recommendations for deletions/additions/amendments were then considered by the whole QIC. The QIC also met with the Executive Dean to ensure conformance with the current emerging Faculty strategy and for his approval.

The "relevant sections of all relevant reports" referred to above were:

- Recommendations of the PRG to the School + RINCE and the Faculty
- SWOT analysis within, and recommendations that appear throughout, the School's Self-Assessment Report (SAR)

and these were prioritised using the following criteria:

- PRG priorities
- Budget constraints
- Predicted student intake 2004 (further decline)

### 1.3 School of Electronic Engineering/RINCE Quality Improvement Plan

The PRG report expressed the group's positive view of the School/RINCE Self-Assessment Report and the cooperation it received during its visit:

*"The PRG was impressed by the candidness and the quality of the responses from all the parties it met.*

*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."*

Having considered the PRG Report and, in particular, the set of recommendations therein, the School/RINCE have produced the joint Quality Improvement Plan. Essentially it contains the School and RINCE's responses to the PRG's recommendations and the articulation of the joint short-term (1 year) and medium-term (5 year) plans.

## **2. RESPONSE TO RECOMMENDATIONS IN THE PEER REVIEW GROUP REPORT**

### **Recommendations for and *Responses to* Quality Improvement**

The following table lists all the recommendations that feature in the Peer Review Group's report. These have been numbered in the table, and their order of presentation has been changed in places so as to ensure that recommendations which are thematically related appear consecutively in the document. Recommendations concerning issues that also featured in the School/RINCE Self-Assessment Report are flagged by placing an asterisk beside the number of the recommendation. Where a single recommendation addresses multiple issues, at least one of these figured in the Self-Assessment report.

The PRG report presented its recommendations using the following criteria:

- P1:** A recommendation that is important *and* requires urgent action.
- P2:** A recommendation that is important, but can (or perhaps must) be addressed on a more extended timescale.
- P3:** A recommendation which merits serious consideration but which is not considered to be critical to the quality of the ongoing activities in the School.

And also indicating the entity asked to act upon the recommendation:

- S: School
- F: Faculty
- U: University Executive/Senior Management

Also shown in the table is the response to the recommendation, and the timeline for effecting the response (1 year, 5 year or ongoing).

<p><b>Recommendation in Peer Review Group Report</b></p> <p>The appropriate level of the response is given in brackets, be that at the level of the School <b>(S)</b>, Faculty <b>(F)</b> or University Executive/Senior Management <b>(U)</b></p>	<p><b>Response in Quality Improvement Plan</b></p>
<p>ORGANISATION &amp; MANAGEMENT</p>	
<p><b>1. (P1)</b> 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. <b>(U)</b></p>	<p>The <u>University</u> has no plans to change the budget process which places a premium on students recruited on postgraduate courses and research programmes</p>
<p><b>2. (P1)</b> 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. <b>(U)</b></p>	<p>The <u>University</u> agrees with this proposal. At present, however, government policy is such that it will only fund the university in respect of the tuition fees of full-time students.</p>
<p><b>3*. (P1)</b> Urgently appoint an Executive Dean of the new Engineering and Computing Faculty and complete Faculty reorganisation. <b>(U)</b></p>	<p>The <u>University</u> appointed an Executive Dean in July 2004. Associate Deans for Teaching &amp; Learning (T&amp;L) and Research have been appointed as and a series of Faculty Committees has been established (Faculty Board, Research , Education, Academic Support, Health &amp; Safety Committees).</p> <p style="text-align: right;"><i>Timeline: completed</i></p> <p>A draft <u>Faculty</u> constitution is being prepared.</p> <p style="text-align: right;"><i>Timeline 1 year</i></p>

<p><b>Recommendation in Peer Review Group Report</b></p> <p>The appropriate level of the response is given in brackets, be that at the level of the School <b>(S)</b>, Faculty <b>(F)</b> or University Executive/Senior Management <b>(U)</b></p>	<p><b>Response in Quality Improvement Plan</b></p>
<p><b>4* (P3)</b></p> <p>Explore methods for effectively expanding the School's catchment area, e.g. subsidised transport, focussed accommodation.</p> <p><b>(S)</b></p>	<p>See response to next recommendation. (The <u>School</u> can advocate measures but has no direct influence on external factors, such as subsidised transport and accommodation.).</p> <p style="text-align: right;"><i>Timeline: over the 5-year period</i></p> <p>The <u>University</u> recently organised an away day for Deans, which discussed matters such as student recruitment (and emphasised the importance of adopting a focussed approach to matters related to transport and accommodation.</p>
<p><b>5* (P3)</b></p> <p>Increase penetration of local catchment area through a long-term programme of promotion in the local schools.</p> <p><b>(S)</b></p>	<p>The <u>School</u> is exploring initiatives under the DCU Access programme to encourage greater participation in science and engineering courses by local students. Subject to the provision of adequate resources, the <u>School</u> intends to embark upon an extensive promotion campaign, with the dual objectives of widening its catchment area and increasing penetration therein. (<i>For further details, see the proposal included as Appendix Two</i>).</p> <p style="text-align: right;"><i>Timeline – over the 5 year period</i></p> <p>The <u>School</u> will continue to develop its School liaison programme.</p> <p>The <u>Faculty</u> is also developing an integrated promotion programming in the areas of Engineering and Computing. The Faculty is putting in place other recruitment initiatives that will include:</p> <ul style="list-style-type: none"> <li>• shadowing workshops for secondary school students</li> <li>• Programmes for transition year students</li> </ul> <p>The Faculty is exploring the possibility of a private donor funding the initiatives above</p> <p>The <u>University</u> notes that the School received 50% funding in relation to the access initiative above and encourages the School to apply for the remainder of the funding through the DCU quality improvement fund.</p>



<b>Recommendation in Peer Review Group Report</b>  The appropriate level of the response is given in brackets, be that at the level of the School <b>(S)</b> , Faculty <b>(F)</b> or University Executive/Senior Management <b>(U)</b>	<b>Response in Quality Improvement Plan</b>
PROGRAMMES AND INSTRUCTION	
<b>6 * (P1)</b> Develop strategy for improving student recruitment, especially locally and nationally. <b>(S, F, U)</b>	A major promotion campaign will be a key element of the school strategy in this regard. This strategy is currently being formulated in the context of an urgent <u>Faculty</u> -level response to the recruitment issue. International recruitment has been identified as a potential means of increasing intake. The <u>School</u> is developing its strong French links and is actively involved in a number of recruitment initiatives with Chinese, Malaysian and Bangladeshi institutions. The Head of <u>School</u> undertook a series of visit to institutions in the above countries in late 2004. <i>Timeline: over the 5-year period</i>
<b>7 (P1)</b> Give feedback to students on their written work. <b>(S)</b>	The <u>School</u> is undertaking a review of this matter and will seek to enhance the quality and quantity of such feedback. <i>Timeline: within 1 year</i>
<b>8 (P1)</b> Develop training in teaching methods for both new and existing staff. <b>(S, F, U)</b>	The <u>School</u> will support and encourage staff in the new Performance Management and Development Scheme (PMDS) and in participating in relevant training courses provided by the University. This training has already been completed for Heads and Senior staff in the School and will be rolled out to other academic staff in 2005. Additionally, the <u>School</u> sought and received partial funding for a course on "Improving the quality of PhD student supervision and PhD project management", details of which are given in Appendix Three. <i>Timeline: over the 5-year period</i>  The <u>university</u> notes that the School received 50% funding in relation to the PhD initiative above and encourages the School to apply for the remainder of the funding through the DCU quality improvement fund. <i>Timeline: within 1 year</i>

<b>Recommendation in Peer Review Group Report</b>	<b>Response in Quality Improvement Plan</b>
<p>The appropriate level of the response is given in brackets, be that at the level of the School <b>(S)</b>, Faculty <b>(F)</b> or University Executive/Senior Management <b>(U)</b></p>	
<p><b>9 (P3)</b>                      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.  <b>(S)</b></p>	<p>The <u>School</u> understands that there is a <u>University</u> level (OVPLI) initiative under consideration for improving the nature and quality of student feedback, including through the use of "structured discussions". The <u>School</u> will engage actively with this initiative, including assigning specific committee responsibility through the current (<u>Faculty</u>-led) committee restructuring.</p> <p style="text-align: right;"><i>Timeline – within 1 year</i></p>

<p><b>Recommendation in Peer Review Group Report</b></p> <p>The appropriate level of the response is given in brackets, be that at the level of the School <b>(S)</b>, Faculty <b>(F)</b> or University Executive/Senior Management <b>(U)</b></p>	<p><b>Response in Quality Improvement Plan</b></p>
<p>RESEARCH AND SCHOLARSHIP</p>	
<p><b>10. (P1)</b> Prepare executive document for discussion with OVPR and Senior Management regarding the financial responsibilities of the University in relation to RINCE. <b>(S)</b></p>	<p>Discussions will commence immediately with the University Management (through the <u>Vice-President for Research</u>) on implementing this action.  <i>Timeline: within 1 year</i></p>
<p><b>11 (P1)</b> 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. <b>(S, U)</b></p>	<p>The <u>School</u>, via the school research convenor, will request the <u>Faculty</u> Research Committee to seek such clarification. This will also be the subject of discussion between RINCE, the Faculty and the <u>OVPR</u> The recently developed policy on overheads should facilitate this recommendation.  <i>Timeline: within 1 year</i></p>
<p><b>12 P1</b> Establish an internal forum to discuss ways and means of attracting further substantial funding from SFI <b>(S)</b></p>	<p>The <u>School</u> and <u>RINCE</u> agree that this issue is best dealt with at <u>Faculty</u>-level and through the OVPR. Discussions concerning this matter are already ongoing at RINCE Plenary Meeting level.  <i>Timeline: within 1 year</i></p>
<p><b>13 (P1)S</b> 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. <b>(S)</b></p>	<p>The <u>School</u> has sought funding for two courses: "Improving the quality of PhD student supervision and PhD project management", and "Demonstrating how to demonstrate: a training course for tutors and laboratory assistants." Details are in Appendices Three and Four respectively. Our position on PhD output norms is consistent with the recommendation and is given in Appendix Five.  <i>Timeline: within 1 year</i></p>

<p><b>Recommendation in Peer Review Group Report</b></p>	<p><b>Response in Quality Improvement Plan</b></p>
<p>The appropriate level of the response is given in brackets, be that at the level of the School <b>(S)</b>, Faculty <b>(F)</b> or University Executive/Senior Management <b>(U)</b></p> <p><b>14* (P1)U</b> 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. <b>(U)</b></p>	<p>The <u>University</u> notes that such a policy was recommended in the Recent OECD report on higher education and strongly commends its implementation by central funding bodies.</p>
<p><b>15* (P1)SU</b> Every effort should be made to improve the marketing of RINCE. External benchmarking against EU standards for strategic research centres is one possibility. <b>(S, U)</b></p>	<p>The <u>School</u> agree that improved marketing is required, but a means must be found so that RINCE can do this in a meaningful way. RINCE is developing a promotion plan but this would need to be adequately resourced. The <u>OVPR</u> will undertake discussion with the <u>Faculty</u> and <u>RINCE</u> to progress this recommendation.</p> <p style="text-align: right;"><i>Timeline: over the 5-year period</i></p>
<p><b>16* (P2)S</b> 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. <b>(S)</b></p> <p><b>17* (P2)</b> 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. <b>(S, U)</b></p>	<p>The <u>School</u> recognises that guidelines for research output of various grades of staff are worthwhile. Such guidelines should be part of an overall framework measuring contributions in research, teaching and administration. The School will explore the feasibility of developing such metrics. The <u>School</u> strongly endorses the view that promotion to Senior Lecturer level not by constrained by the 60/40 rule in deserving cases. The <u>University</u> is committed to continuing the process of allocating additional promotional positions to deserving individuals outside of the 60:40 rule</p> <p style="text-align: right;"><i>Timeline: within 1 year</i></p>

<p><b>Recommendation in Peer Review Group Report</b></p> <p>The appropriate level of the response is given in brackets, be that at the level of the School <b>(S)</b>, Faculty <b>(F)</b> or University Executive/Senior Management <b>(U)</b></p>	<p><b>Response in Quality Improvement Plan</b></p>
<p>STAFFING, ACCOMMODATION AND RESOURCES</p>	
<p><b>18* (P1)</b> 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. <b>(U)</b></p> <p><b>19* (P1)</b> 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. <b>(U)</b></p>	<p>See <u>School</u> and <u>University</u> response to the two related recommendations (16,17) above.</p> <p>The <u>University</u> undertakes to continue to monitor its policies on promotion, in line with best practice.</p>
<p><b>20 (P1)</b> Enter into a dialogue with the Finance Office to improve the service provided to the School. <b>(U)</b></p>	<p>This will be pursued at <u>Faculty</u> level through the Faculty Office and the new Faculty Administration Support Group (ASG) that is being established.</p> <p>The <u>Finance Office</u> has established an Academic Research desk with dedicated staff to liaise with the Faculty Office</p>
<p><b>21 (P1)</b> Retain the current mechanism for setting School budgets in the University. <b>(U)</b></p>	<p>The <u>School</u> has favoured the current mechanism in principle but also recognises that new mechanisms are necessary in the <u>Faculty</u> context. Reward for additional income generation is also favoured.</p>

<p><b>Recommendation in Peer Review Group Report</b></p> <p>The appropriate level of the response is given in brackets, be that at the level of the School <b>(S)</b>, Faculty <b>(F)</b> or University Executive/Senior Management <b>(U)</b></p>	<p><b>Response in Quality Improvement Plan</b></p>
<p><b>22 (P1)</b> Enhance the new Research and Engineering Building by providing some seating, refreshments and plants in the public areas. <b>(S, U)</b></p>	<p>The <u>School</u> will pursue with the faculty and the university the possibility of establishing a convivial social area (for students and staff) in the Research and Engineering building. It further proposes that the building be more aptly named and that appropriate signage be put in place, within the building and on campus. The <u>University</u> encourages the School to submit a proposal for funding through the DCU quality improvement fund</p> <p style="text-align: right;"><i>Timeline: within 1 year</i></p>
<p><b>23* (P2)</b> Explore with SIPTU and HR the possibility of developing a career path for technical staff. (U)</p> <p><b>24 (P1)</b> Develop a scheme whereby excellent technical support staff can be integrated into a research-oriented career if so desired. <b>(U)</b></p>	<p>The <u>School</u> agrees with this suggestion. The subjects of both of these recommendations are likely to emerge from the PMDS and the school will support the career objectives that are expressed by the technical staff during that process. <i>Timeline: over the 5-year period</i></p> <p>The <u>University</u> is developing a reward and recognition system for non-academic staff. <i>Timeline: within 1 year</i></p>

### 3. PRIORITISED RESOURCE REQUIREMENTS

1. Funding for the two courses "Improving the quality of PhD student supervision and PhD project management", and "Demonstrating how to demonstrate: a training course for tutors and laboratory assistants." The combined cost of delivery for these courses is €21,000 but €10,000 will be available from other sources.

**Estimated cost: €11,000**

2. A staff member to be seconded for one year to address the promotion and marketing of the School's undergraduate degree programmes.

**Estimated cost of teaching substitution: €25,000**

3. The "open opportunities" strand of the Access Proposal in Appendix Two, which addresses recommendations Four through Six of the Peer Review Group by seeking to increase the pool of students eligible to pursue a career in Electronic Engineering, to be funded for its first year of operation.

**Estimated cost: €26,000**

#### **4. SUMMARY OF THE ONE-YEAR PLAN**

##### **At School Level:**

Currently the future strategy and activities of the new Faculty of Engineering & Computing are being defined and the structure and organisation to implement its plans and carry out its activities are being put in place. Planning for the School of Electronic Engineering and RINCE is taking place within this evolving context.

Within the year the School/RINCE will:

- Streamline its CAO recruitment paths and support them with innovative and directed promotional initiatives;
- Address the major obstacles to the recruitment of students into engineering (e.g., the specific mathematics entry requirement) by exploring novel pathways to degree attainment within the School;
- Conduct a critical review of the academic structure of the School's undergraduate programmes;
- Continue actively in developing the emerging possibilities of non-EU student recruitment;
- Strive to enhance the university experience for students in the School of Electronic Engineering by improved communications and feedback on submitted work, by creating a more inclusive and convivial ambiance, and by establishing clear channels through which the students can contribute to the development of their academic programme(s);
- Implement the Quality Assurance Thresholding scheme (as described in the Self Assessment Report);
- Support and encourage staff to participate in relevant training courses (especially in the content of teaching) provided by the university or externally;
- Subject to funds becoming available, run the proposed courses:
  - "Improving the quality of PhD student supervision and PhD project management", and
  - "Demonstrating how to demonstrate: a training course for tutors and laboratory assistants."
- Subject to funds becoming available, embark upon Year One of the Access programme documented in Appendix Two;
- Protect the future of the School's highly successful taught postgraduate programmes by implementing its development plan and buffering its intake against job market fluctuations;
- Reorganise the School's management structure to improve efficiency and quality;
- Exploit the School's unique strengths that pertain to the university's ICT theme.



## **RINCE**

RINCE management will:

- Embark on discussions with the Office of the Vice-President for Research and senior university management regarding support (financial and administrative) for research centres such as RINCE;
- Explore as a group how best to avail of funding opportunities for RINCE with SFI and other funding bodies;
- Undertake measures to formalise the training of research students
- Develop a policy regarding norms for research output of staff and students, and a strategy for assisting in the attainment of these norms;
- Explore how to enhance the breadth and depth of RINCE expertise in niche areas such as RF communications.

## **5. SUMMARY OF THE FIVE-YEAR PLAN**

### **At School level**

The School's Five-Year Plan is subject to revision in the light of the ongoing refinement of the faculty structure within which it operates. However, key elements of the strategy are the following:

- To address the ongoing issue of undergraduate recruitment, by building upon the access measures of the one-year plan, and by participating in sector-wide measures to increase the attractiveness of engineering as a career choice for secondary school students;
- In concert with the University management, to preserve and enhance the quality of staff, through the PMDS mechanism, the provision of rewarding career paths, and other measures;
- If the necessary funds are made available, to implement the five-year Access programme documented in Appendix Two.

### **RINCE**

RINCE will:

- Subject to the provision of a suitable budget, take measures to promote the Institute and its research capabilities amongst prospective staff and students, funding organisations and key industry players;
- Within budgetary constraints, enhance the number of full-time staff in RINCE through secondment and an enhanced visiting professor programme;
- With the co-operation of the University, develop a viable mechanism for recurrent funding of the Institute's operations;
- Expand via organic growth into a range of ICT disciplines of strategic national importance;
- Enhance the quality and quantity of its research output to be comparable with the "best of breed" globally.

## **Appendix One: School Quality Committee and Peer Review Group memberships**

Below is listed the membership of:

- **School Quality Committee (for the Self-Assessment Report)**

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

- **Peer Review Group**

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)

- **School Quality Committee (for the Quality Improvement Plan)**

Dr. Martin Collier	Senior Lecturer (chair)
Mr. Jim Dowling	Head of School
Ms. Tanya Keogh	Faculty Office representative
Mr. David Molloy	Analyst/Programmer
Dr. Valentin Muresan	Post-doc
Prof. Patrick McNally	RINCE Director
Dr. Barry McMullin	Senior Lecturer
Mr. Paul Wogan	Senior Technician

## **Appendix Two: Access Proposal of Prof. Charles McCorkell**

# **School of Electronic Engineering**

## **Enhancing access to Engineering programmes**

**A project proposal under the HEA Strategic Initiatives scheme – Access strand**

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In its strategic plan, Leading Change, DCU refers to its role in local economic and community development, quality of life issues, social equality, and inclusion, with a specific emphasis given to the development of North Dublin. This project is in the context of this theme.

The project is scheduled to run over five years. Funding is being requested for the first year at this time. Further funding will be requested in each of the subsequent years of the project. The School of Electronic Engineering is guaranteeing a contribution of thirty per cent of the estimated total cost in this first year. It is intended that the project will involve a Faculty-wide group from DCU after the year 1, and it is planned that a wider geographical distribution of Schools, including rural schools in the North East region, will be involved.

## 1. SUMMARY

The project addresses the barriers to entry to the engineering profession in North Dublin caused by lack of career information and levels of educational attainment among potential engineering students. It is scheduled to run over 5 years. A partnership will be established between staff at DCU and secondary schools in the North Dublin area.

- The first task will be to profile the opportunity that exists through information gathering and analysis.

For the purposes of the project, routes into third level will be classified as 'normal' or 'alternative'. The former refers to circumstances where programme specific academic requirements are facilitated but where an additional support programme in the form of career awareness or academic support may nonetheless be required. The latter refers to the situation where motivation is high but programme specific requirements are not catered for at critical points in student preparation.

- Normal and alternative route support programmes will be defined.

Thinking ahead to possibly establishing sustainable long-term initiatives, three significant ideas will be evaluated.

The first we are choosing at this point to call an 'Engineering in University Career Awareness Network' (EU\_CAN). This will benefit from the School of Electronic Engineering's leading position in supporting education with technology, a history at DCU EE of providing so called 'taster' courses for those considering Engineering as a career, and the proposed partnership between the secondary schools and DCU.

The second is to consider establishing a programme or Institution to provide continuing and individual support to students in subjects that are key to engineering, and to allow them demonstrate a competence at or equivalent to the normal university entry requirements in the key subjects.

The third addresses openness, prerequisites and choice at third level. Practically all that is on offer to young people at the moment is based on a fixed curriculum with award titles determined at the time of entry to University or shortly thereafter. Fixed curriculum programmes almost always have elevated entry requirements attached that are set on the basis of historical precedent. The project will examine the feasibility of an 'open opportunities' initiative that will exploit modularity and which will have the potential to cater for a more diverse intake.

## 2. PROPOSERS:

1. The ACCESS office at DCU
2. The School of Electronic Engineering at DCU and RINCE
3. The DCU link school steering committee

## 3. INTRODUCTION

A review of how several external factors are now impacting on our thinking about Engineering education is timely. These include the Bologna declaration, the

issuing of new (output-based) accreditation regulations by the IEI, the role of the NQAI in setting national standards, the role of HETAC and FETAC on qualifications, the gradual internationalising of the third level sector, the recent change in the nature of technology based employment (now favouring innovation over manufacture), the growth and redistribution of the population (in Leinster in particular) in recent years, the downward trend in the Leaving Certificate population, and the severe downturn in the interest by second level students in disciplines associated with ICT.

The last of these is in some ways the most difficult to understand in that insofar as shortages in engineering manpower are forecast, they are identified in particular with Electronic Engineering.

Whilst many things are changing, some stay stubbornly the same. DCU is situated in the heart of North Dublin. The recently published CSO statistics indicate very clearly that considerably fewer young people attend college in the broader North and West Dublin, and Fingal areas than in other areas of the city. There are two principal inhibitors to access. One is academic (Leaving Certificate performance) and the other is socio-economic. In addition to the geographical under-representation, applications from women and mature students are few and notably not increasing.

The critical role that mathematics has had and will continue to have needs specific mention. Admission to professional engineering programmes that meet the academic requirements for chartered engineering status has traditionally been limited to those who meet a set of minimum university requirements, and critically a set of programme specific requirements in 'key subjects'. The most important key subject is mathematics, where a grade of HC or better in the leaving certificate is recommended. The result of the maths requirement is that relatively few of the leaving certificate population are eligible to gain access to BEng programmes, and when student career preferences take effect fewer still chose Engineering as a career.

An alternative to the professional route exists in that students can complete a set of programmes that lead to a degree award as an add-on to a national diploma. However this route does not have the guarantee of meeting the educational requirements for chartered status.

With this as a background the School of Electronic Engineering at DCU, at a review of undergraduate programmes in November 2003, agreed the following actions that are relevant to this application:

1. To explore diversification options by:
  - a. Considering academic partnerships
  - b. Expanding minority gateways
    - i. Mature
    - ii. Women
    - iii. Non-EU
    - iv. Advanced entry
  - c. Exploring new gateways
    - i. Non-accredited degrees
    - ii. Entrance exams
    - iii. Pre-course tuition and foundation studies
2. To establish a re-accreditation group to prepare for the 'new' outcomes based approach by the IEI
3. To reformulate programmes in anticipation of Bologna.

The purpose of this project is to use the opportunity that comes with a rapidly changing external environment to address diversity by reconsidering curriculum, structure, and access, and in particular to deal in a directed way with the educational access challenge that is on our doorstep.

#### 4. GOAL:

To contribute to regional and national targets on equality of opportunity through initiatives in access enhancement to engineering education at DCU

#### 5. PURPOSE:

To establish an access diversity programme involving a partnership between the School of Electronic Engineering at DCU, and secondary schools in the North Dublin/Fingal areas

#### 6. RESULTS:

The results of the project will be:

1. Structural barriers to access to engineering programmes identified.
2. Apparent under-participation of young people in North Dublin in engineering education at DCU explained.
3. The number of young people participating in engineering career awareness and academic support programmes at the interface between second and third level through DCU increased
4. The number of young people from the targeted areas entering engineering programmes increased.
5. The number of graduates qualifying from engineering and technology programmes at DCU coming from the targeted areas increased.
6. The number of young people entering the Engineering profession from the targeted areas increased.
7. Building from the initial DCU link-school network, an extensive Engineering in University Career Awareness Network (EU\_CAN) (for sustainable promotion of the career value of Engineering, and for the identification of access opportunities from a wider range of disadvantaged areas and schools) established
8. The feasibility of establishing a programme or Institution to provide continuing and individual support to students in subjects that are key to engineering, and to allow them demonstrate a competence at or equivalent to the normal university entry requirements in the key subjects.
9. Requirements of a more diverse intake factored into the School of Electronic Engineering's set of programmes at undergraduate level.

#### 7. ACTIVITIES

##### **Year 1:**

1. Preliminary project planning and team building.
2. Career motivation/interest and 'key subject' profiling. An assessment of sustainability of supply of potential engineering students from targeted areas.
3. Definition and evaluation of EU\_CAN idea
4. Definition of 'normal route' assistance programme.

5. Definition of 'alternative route' assistance programme.
6. Development of an experiential interactive promotional programme and pilot career awareness activities.
7. A curriculum response project – the feasibility of the 'open opportunities' idea examined
8. Preliminary consideration given to a long term structured response in the form of a programme or institution to provide continuing and individual support to students in subjects that are key to engineering.
9. Evaluation of the potential of technology to support access in the longer term

## **Year 2**

1. Implementation of pilot initiatives:
  - a. Normal route assistance programme
  - b. Alternative route assistance programme
  - c. Interactive promotional programme
  - d. Technology support demonstrations
2. Continuation of curriculum response project
3. Further evaluations of EU\_CAN idea
4. Further consideration of long term structured response.

## **Year 3**

1. Continued development of piloted initiatives towards mainstreaming
2. Implementation of curriculum change defined in years 1 and 2 as appropriate
3. Implementation of EU\_CAN initiative
4. Implementation of elements of long-term structured response.

## **Years 4/5**

Continued mainstreaming of outcomes of the first three years with particular attention applied to long term structured response and sustainability of initiatives.

## **8. DELIVERABLES:**

The deliverables are defined with respect to the activities as follows:

### **Year 1**

1. Report detailing project plan for year 1 of the project and outline plan for additional years
2. Report on results of survey and analysis of 'key subject' student performance at junior and leaving certificate levels in the DCU link schools over a number of years, plus 5 year prediction on 'key subject' participation at leaving certificate.
3. Report profiling a possible EU\_CAN network.
4. Report on initiatives identified as supporting access by students at leaving certificate level who wish to compete for places on Engineering programmes whilst conforming with standard professional degree entry standards.
5. Report on initiatives identified as supporting access by students at leaving certificate level or through other qualifications who wish to compete for places on Engineering programmes and whose academic profile does not conform to standard professional degree entry standards in 'key subjects'.
6. Report outlining interactive technology promotional demonstrations and possible 'taster' courses. Instructional materials associated with selected demonstrations for evaluation



7. Report detailing a review of curriculum constraints, against the background of identified constraints to access both academic and financial, with proposals for change. The 'open opportunities' idea evaluated
8. Preliminary report on feasibility of structured long-term response
9. Report outlining possible applications of ICT to facilitate learning in support of access enhancement at the individual level.

### **Year 2**

1. Demonstrations and a report detailing pilot initiatives
2. Report outlining curriculum change options for validation and accreditation
3. Feasibility reports on EU\_CAN and Long-term structured response

### **Year 3**

1. Report on fully implemented piloted initiatives
2. Report on programme modifications introduced to accommodated intake diversity
3. Progress of EU\_CAN and sustainable long-term structured response ideas.

### **Years4/5**

Several of the results of the project should be apparent by years 4 and 5. The deliverables for years 4 and 5 will be in the form of reports detailing the project achievements against the intended results, and recommendations and plans for sustainability of the initiative beyond year 5.

## **9. INDICATORS**

### **Year 1**

The following indicators are associated with project results:

1. Academic, social, and economic barriers reviewed by end of year 1.
2. Non-participation factors identified and level of non-partition quantified by end of year 1
3. Target number of schools participating in career awareness activities under the programme at 40 in year 1, and number of individuals participating in career awareness activities under the programme at 300 in year 1
4. A 5 year forecast of the number of potential access students interested in a career in Electronic Engineering from the linked schools completed by the end of year 1
5. The EU\_CAN initiative defined by the end of year 1
6. A model of the 'open opportunities' curriculum, as it might apply to the suit of programmes in the School of Electronic Engineering, described by the end of year 1
7. Longer term structured response alternatives identified by the end of year 1.

### **Years 2 – 5**

Indicators for year 2 to 5 will be defined on the basis of the outcome of the work in year 1

## **10. METHODOLOGY**

The focus of the first year of the project is very much on opportunity identification, definition, the formulation of long-term options, and to a lesser extent student interaction. Although the latter is catered for, it is not intended that promising initiatives be delayed unnecessarily. However it is planned to maintain an interest in initiatives that have the prospect of longer term value. As the project unfolds the focus will shift to implementation with the emphasis largely on student processing.

A number of methods will be deployed in the first year activities as follows:

<b>Activity</b>	<b>Methodology</b>
1. Preliminary project planning and team building.	Workshop
2. Career motivation/interest and 'Key subject' profiling. An assessment of sustainability of supply of potential engineering students from targeted areas.	Survey & consultation
3. Definition and evaluation of EU_CAN idea	Consultation & design
4. Definition of 'normal route' assistance	Consultation & design programme.
5. Definition of 'alternative route' assistance programme.	Consultation & design
6. Development of an experiential interactive promotional programme plus career awareness	Research, design, test& career workshops
7. A curriculum response project	Workshop
8. Preliminary consideration given to a long term structured response in the form of a programme or institution to provide continuing and individual support to students in subjects that are key to engineering.	Consultation & workshop
9. Evaluation of the potential of technology to support access in the longer term	Consultation & design

## 11. CONTRIBUTED RESOURCES

Space for physical demonstration, and workshops is available in the School of Electronic Engineering at DCU. A percentage of staff time in DCU and secondary school input is assumed. Technical development facilities at DCU will be available to the project.

## 12. MANAGEMENT

A project leader with the guidance of a steering committee will manage the project. The steering committee will meet on 3-month intervals to review progress. All students coming to DCU under this project will be managed and monitored by the ACCESS service at DCU

## 13. COSTS

The costs are stated for year 1 only.

<b>Staffing</b>		<b>Cost (Euro)</b>
Project leader DCU	Lecturer level	40,000
Project Schools coordinator	Teacher on secondment	30,000
Technical development	Replacement cost	20,000
IT development	Replacement cost	10,000
Administrative support	Replacement cost	10,000
<i>Total</i>		<i>110,000</i>
<b>Non-Pay</b>		
Travel		3,000
Materials for demonstrations		10,000
IT support facilities		5,000
Promotional materials		10,000
Miscellaneous materials		2,000
<i>Total</i>		<i>30,000</i>
<b>Total cost</b>		<b>140,000</b>

## 14. FUNDING

<b>Contribution</b>	<b>@ 30% costs</b>	<b>€ 42,000</b>
Request	@ 70% costs	<b>€98,000</b>

## **Appendix Three: Course on PhD supervision**

### **Course Title:**

**Improving the quality of PhD student supervision and PhD project management**

### **Target Group:**

The proposed training programme is for academic staff and postdoctoral researchers in the Faculty of Engineering and Computing who are responsible for or involved in the supervision of PhD students and the management of research projects involving the training of researchers.

### **Aims and objectives:**

An aim that is widely shared across the Faculty is to have appropriate structures and processes in place, operated by staff with the requisite skills and knowledge, such that students with suitable background and abilities who put in the required effort, would be able to achieve the standard for the award of a PhD.

It is up to the Faculty and the component schools to put the appropriate structures and processes to support efficient and high-quality PhD programmes in place, but an ad hoc Research Committee within the faculty is already looking at what these might be in the context of a Faculty research plan. This course is one element in a coordinated plan to specify, implement and operate these structures and processes.

The objective of this training course is to ensure that all staff involved in the supervision of PhD students, from senior academics to post-doctoral researchers, would have the skills necessary to ensure that efficient and high-quality PhD research programmes can consistently be implemented for all research students associated with them.

### **Course Description:**

The process involved in the successful completion of a PhD programme, from initial specification and recruitment, right through to submission, examination and progressing the graduand to the next stage of their career, is one that requires a very diverse set of skills of the supervisor. Not everyone involved in research is innately possessed of these skills. Even senior academics who have graduated many PhD students may not be as strong as would be desired in the full range of skills, with the consequence that (i) some of their students take longer than might be otherwise necessary to complete their PhDs, (ii) students who do complete, might do so without having fully realised their potential, (iii) students who might have been able to complete, ended up changing their career path and not achieving a PhD, (iv) opportunities to recruit the best and most suitable students were missed and (v) the overall PhD output of the staff member concerned might have been lower than their potential. Because of the small numbers of PhD students involved with a particular academic, it is difficult to separate factors involving the skills of the research supervisor from those of the PhD student and other external factors such as the funding environment, or the subject area. However, on a University-wide basis or a third-level-sector-wide basis it is possible to see trends in completion rates and completion times for PhD students that are clearly in need of improvement.

In this course we want to identify the skills necessary to achieve efficient and high-quality PhD programmes. We want to ensure that all staff involved in the course come to possess as far as possible the full set of skills required for involvement in PhD student supervision. And finally, where a required skill is just not in the nature of an individual, that they would come to recognise this and find an alternative way of allowing their students to benefit from such a skill.

Identifying the required skills is an integral element of this course, and they may indeed be different for different subjects. However, in order to provide structure for the development of the course, some of the issues to be addressed are described below. The list of issues is based on the work of the IUQB meeting on *Good Practice in the Organisation of PhD Programmes* held on 28th - 29th April, 2004 in *The Westin At College Green*, Dublin, with additional input from the School of Electronic Engineering, DCU, based on our experience over the last decade and a half.

The overall emphasis of this course is on the skills required for the efficient management of the PhD student and the student's programme, with a particular emphasis on quality assurance and student support consistent with the objectives of a PhD programme, which is to produce a person capable of independent research to the highest standards.

The following list of issues gives an overview of the range of activities involved in a PhD programme. In this course we will try to identify the set of skills required to implement these activities in practice and try to develop and/or foster these skills in the participants.

Topic/Project definition

Sourcing funding

Recruitment of suitable candidates

Project Plan, mapped out over the proposed period of the programme

- Schedule
- Milestones
- Deliverables
- Resourcing
- Reporting
- Division of responsibilities

Induction

- different levels (university, department, topic-specific)
- provision for different start dates
- involvement of established PhD students
- additional/different requirements for overseas or mature students (one size does not fit all)
- good use of induction/information materials (e.g. handbooks, regulations, web)
- designated persons responsible for organising induction within school/faculty
- structure in priorities in training/knowledge
- structured building of cohesive measures between PhD students in school/faculty (i.e. idea of PhD class or group at a common stage of development rather than having a common topic)

Project management and supervision

- room for a variety of supervisory styles consistent with good professional practice
- pastoral care of research students
- provision for conflict resolution

- processes and structures for active monitoring of progress and providing feedback
  - the community of PhD students as a learning resource
  - aim to support supervisors and not add load in the structuring of PhD programmes
  - rewards for undertaking supervision, recognising workloads, differences between disciplines – use of formula for different types of workload
  - supervisory committee useful in ensuring rights of students and supervisors, but need to avoid simply adding complexity and workload
- The role of the supervisor
- the need for support/mentoring of new supervisors
  - identifying difficulties early
  - selecting and implementing appropriate remedial action where required
  - the advantages and pitfalls of co-supervision
  - the characteristics of a “good” supervisor: professional, competent, knowledgeable (of university, of procedures, of publications, etc), sympathetic, empathetic, organised, accessible
  - the supervisor as a facilitator or advisor
- Training for PhD students
- importance of training needs analysis so that there is a level of planning
  - important for supervisor training to be integrated into training of students to reinforce this
  - assessment in the training of students – should it be compulsory, e.g. H&S training?
  - timing of training – progression, planning, the spread over three years – levels (university, faculty, topic)
  - University level training of PhD students – how this should be specified
    - Research induction
    - Professional development
    - Project management skills
    - IT Skills
    - Writing skills
    - Good practice in research, including ethics
    - Methodological differences between sciences and humanities
  - Faculty level training of PhD students
    - Career development
    - Tutoring/teaching
    - Sub-specific research design
    - Quantitative/qualitative research skills
    - Library
  - Research Group Level
    - Research design
    - Presentation of research
- Examination processes
- Thesis – how it should be structured and presented, including, extensive literature review; making the originality of the contribution explicit; if published articles included, the student’s work should be clearly identified
  - Publications – their role in the subject area and input to the examination process
  - the PhD examination process in DCU from notification of intention to submit, through the viva voce and the constitution of the exam board, to the conferring

**Course format:**

In order to have a long lasting impact, it is felt that the course should have components spread over a period of time to allow the participants to implement things learnt in the course in practice and to return to re-evaluate and possibly refine them.

Also, it is not intended that all the participants would simply be there to learn from the course – it is expected that many participants would be there because of what they have to offer to other participants on the course.

To ensure relevance, it is proposed that the main course would be preceded by a half-day meeting with a focus group drawn from the overall cohort of participants.

The nature of academic work is that there are many players and activities that typically impinge on the available time of the academic. To ensure whole-hearted participation in the course, it is proposed to hold it off-campus with a long lead-in time to avoid timetable conflicts and the full support of the head(s) concerned to ensure maximum participation of both senior and junior academics.

To satisfy the above requirements, it is proposed to have a two one-day off-site course days, separated by up to six months, with a half-day focus-group meeting being configured as part of the preparation for the course.

The course format would be a combination of presentations on relevant management, quality, personality/psychology and organisational issues, case study and role-play scenarios for maximum impact, and focus group/plenary session combinations to give ownership and reality to the outcomes.

**Duration (Days)**

***Two one-day course days.***

**Costings:**

We envisage a 2-day Training Course/Workshop delivered by 2 senior people. We feel that two presenters/facilitators need to be involved because of the number of potential participants drawn from the three schools in the faculty.

<b>Item</b>	<b>Cost</b>
<b>Preparation (5 man days at 1200 euro per day, including preparatory meeting)</b>	<b>6000</b>
<b>Delivery (4 man days)</b>	<b>4800</b>
<b>Materials (including photocopying of case studies, etc), hire of rooms, hospitality for off-site location, etc)</b>	<b>2500</b>
<b>Total</b>	<b>13300</b>

## **Appendix Four: Course on laboratory demonstration**

### **Course Title:**

**'Demonstrating how to demonstrate: A training course for tutors and laboratory assistants'**

### **Target Group:**

The proposed training programme is for the postgraduate students who are responsible for the delivery of tutorials and laboratories within the DCU School of Electronic Engineering. In addition representative members of the lecturing, technical and administrative staff involved in the setting, support and scheduling of these tutorials and laboratories will be fully involved in the training needs analysis stage and will be encouraged to attend the workshop.

### **Aims and objectives:**

The objective of this training programme is to instruct demonstrators in the identification and management of issues that arise in the delivery of the School's tutorials and laboratories. A central outcome of the programme will be the generation of a document outlining best practice in this important teaching area. This document will be maintained within the School and made available to all future demonstrators as well as the wider DCU community.

### **Course Description:**

#### **Introduction:**

The School of Electronic Engineering offers several degree programmes in electronic engineering and related areas. The content of the degree programmes is delivered in a traditional mixture of formats. Course material is formally presented and explored in hour-long lectures. Supporting the lectures is a diverse mixture of laboratories and tutorials in which the students are encouraged to actively engage with the course material via practical experimentation, assignments, problem solving and discussion. It is widely recognised that these interactive sessions significantly differentiate the third-level student experience from that of second-level. Our experience has been that they can foster a dynamic, questioning and friendly approach to studying, which in turn can play a major role in the attraction and retention of students.

The School of Electronic Engineering is committed to maintaining the highest standards in all aspects of our teaching duties. The recently conducted School Quality Review noted this commitment and commended the high standard of courses offered as well as the high levels of staff motivation. One of the recommendations to come out of the review process was to further improve the service we offer to students in the area of laboratories and tutorials [1]. The purpose of the training programme outlined in this proposal is to facilitate the implementation of this recommendation. It aims to train our demonstrators to the highest possible standards and to specify guidelines for best practice in this area that will underpin our teaching efforts over the forthcoming years.



**Description:**

The proposed training will be in two parts, a preliminary training needs analysis followed a month later by a two-day workshop.

The justification for the training needs analysis lies in the recognition that the effective delivery of tutorials and laboratories involves the cooperation of a wide range of people and is affected by a diverse variety of issues. It is imperative that the training programme has input from all these stakeholders if it is to successfully form the basis for excellence in this area. The needs analysis will involve the programme instructor meeting with representatives of all groups who have an interest in the effective delivery of tutorials and laboratories. Specifically, a series of meetings with undergraduate students, postgraduate students, administrative staff, technical staff and lecturing staff will identify and explore the key issues which dictate the effective delivery of tutorials and laboratories in a modern engineering school. These meetings will examine the methods presently in place in the School of Electronic Engineering and investigate possible methods of improvement. The outcome of the training needs analysis will be a report that will form the basis of both the training workshop and the subsequent document of best practice.

Obviously the range of academic activities across the school's several distinct degree programmes precludes the training programme from addressing specific issues relating to individual labs or tutorials. Instead, and without wishing to pre-empt the outcome of the training needs analysis, we have identified several generic themes that may form a starting point for discussion.

Responsibilities and rights of the demonstrator  
Demonstration and tutoring strategies.  
Guidelines for marking and feedback.

We expand these suggested themes further in the next section.

**RESPONSIBILITIES AND RIGHTS OF THE DEMONSTRATOR/TUTOR:**

A common source of confusion amongst demonstrators is in knowing the precise extent of their duties and their rights. This theme will attempt to place their role in the context of the overall hierarchy of responsibility within the University. In particular it should address, amongst other topics,

What support the demonstrator should receive from lecturing, technical and administrative staff. In particular it will clarify issues such as obtaining relevant course material, obtaining tutorial questions/solutions, maintenance of laboratory equipment, scheduling of demonstrators with laboratories and tutorials that match their competencies etc.

How to deal with uncooperative or abusive students. It is vital that demonstrators are aware of their rights in dealing with such situations. There must be a clear understanding of the disciplinary structures that are in place to protect them and the range of options they have in dealing with potentially troublesome students.

How to deal with copying and other transgressions. Again the demonstrators should be aware of what their responsibilities are and what courses of action are available to them to combat infringements such as copying etc.

Awareness of health and safety issues. The demonstrator is the University's representative during a laboratory or tutorial. As such it is imperative that they are aware of their duties in maintaining a safe environment, procedures to follow

in the event of an emergency situation, and of the relevant health and safety structures that exist within the University.

Awareness of disabilities. It is incumbent on the demonstrator to be aware of the needs of students with disabilities and to treat them with dignity and consideration.

## **DEMONSTRATION AND TUTORING STRATEGIES**

Tutorials and laboratories are different learning environments from lectures. They offer the student the chance to actively engage with course material in an open, interactive fashion but this interactive format can often prove quite intimidating (to both undergraduate and demonstrator). Obviously the optimal running of such sessions requires a flexible, well-trained and motivated demonstrator. This theme will explore

The role of the laboratory/tutorial within the curriculum. It is important that the School maintain a consensus on what is expected academically from laboratories and tutorials so as to present a clear picture of what is expected from the demonstrator.

Teaching strategies within the laboratory/tutorial. How best to engage with students. Specifically techniques in small group learning, large group learning, encouraging student participation without alienating less confident students [2]

Self-assessment of their own performance. This training programme will ideally be the first step in a process whereby the demonstrators learn how to evaluate their own performance and improve their teaching methods year on year.

How to teach the difficult abstract concepts that naturally arise in such a mathematically intensive course such as engineering. There are many interesting techniques that can help the demonstrator shed light on difficult abstract topics [3].

The effective use of multimedia within (and in support of) labs and tutorials. Dissemination of information, solutions, related material over the Internet. The use of message boards as a forum for exploring a topic etc.

## **GUIDELINES FOR MARKING AND FEEDBACK:**

A vital component of the learning process is the provision of useful and timely feedback to students. This theme will explore the following topics.

Before one can provide feedback to students as regards assignments etc. it is only fair that they are properly instructed in what constitutes a correct answer. To do this the demonstrators will need instruction in basic report writing, laboratory write-ups etc.

How to mark assignments in a fair and equitable manner. The demonstrators should be aware of best practice in the proper marking of assignments laboratory reports etc. Guidelines need to be implemented as to what constitutes a fair turn-around time from submission of material to receiving a mark as well as instruction on the issues of confidentiality and security. This is particularly important for demonstrators charged with the responsibility of marking assignments for the taught postgraduate course. These assignments can make up a significant portion of the mark for an individual module and it is imperative that they continue to be marked in accordance with the highest standards.

How best to disseminate feedback to students. The demonstrators should be trained in constructive methods of disseminating feedback, both within the classroom and in marked material.

The use of computer based assessment techniques.

**Course format:**

The training needs analysis will consist of series of meetings to be held in DCU between the instructor and the representatives of the various parties involved in tutorials and laboratories. Having canvassed the opinions of all interested parties into the relevant topics the instructor shall write a short summary report. This report will inform the conduct of the two-day workshop. It will also form the basis of a document outlining best practice that will be put together after the workshop and used in all future training of demonstrators.

This needs analysis will be followed a month later by the training workshop, also to be held in DCU. This workshop will be attended by all demonstrators within the School as well as any interested lecturers, technical staff etc. We expect the attendance to be in the region of 30-35.

The precise form of the workshop will obviously be dictated by the results of the training needs analysis and the preferences of the instructor. A reasonable approach would seem to be to organise it into several sessions over the two-day period. Each session will focus on one of the key themes identified during the training needs analysis phase. Each session will follow a standard theory, practice and review format. The theory section will explore the issues involved and identify the best practices for dealing with them. The participants will then have a chance to practise these techniques in a series of role-playing encounters, small group discussions etc. Each session will end with a review of the material covered.

An essential outcome of the training process will be the generation of a document outlining best practice in the area of tutorials and laboratories. The summary report prepared by the instructor during the training needs analysis phase will form the initial basis of this document. The issues raised during this phase will suggest the topics to be covered by the workshop. Finally the summary report in addition to the workshop materials will form the basis for a best practice document. This document will be assembled by a School staff member working in conjunction with one or possibly two senior postgraduate students.

**Duration (Days)**

The training process will require 3 days in total; 1 day for the training needs analysis and 2 days for the workshop. In addition we will require funding for 2 additional days of workshop preparation time.

**Costings:**

The main cost incurred will be payment of the instructor for 5 days. This payment will cover the training needs analysis, generation of the initial summary report and preparation for, and running of, the workshop. We will liase with the DCU training and development office in the identification of a suitable instructor.

The materials needed for running the workshop include stationary, flipcharts, folders etc. We are requesting 1000 euro to for support staff. This will include payment to the postgraduate students to help finalise the document of best practice. This figure will also cover some administrative and technical staff support. Other expenses will cover lunches, tea breaks and other small expenses.

<b>Item</b>	<b>Cost</b>
Instructor (5 days at 1200 euro per day)	6000
Materials	500
Support staff	1000
Other	250
<b>Total</b>	<b>7750</b>

**Demonstrable multiplier effect:**

An essential outcome of the workshop will be the development of a document of best practice in tutorials and laboratories. This document will be used within the School as a guide to the preparation and conduct of tutorials and laboratories in future. It will also be made available to other Schools throughout the University. A member of staff will be responsible for the maintenance of the document and to act as an aide for postgraduate students in the future.

**References:**

- [1] School of Electronic Engineering Quality Review exit presentation.
- [2] '53 interesting things to do in your seminars and tutorials' Habeshaw et al. Technical and Educational Services Ltd. ISBN 0 947885 08 0
- [3] '53 interesting ways to teach mathematics' Ruth Hubbard, Technical and Educational Services Ltd. ISBN 0 947885 65 X

## **Appendix Five: PhD Quality and Norms**

The Faculty Research Committee will establish clear procedures for training postgraduate students in research skills. This will be implemented through a number of participative workshops and seminars throughout the academic year. Particular emphasis will be placed on the following:

- Collaboration, sharing ideas, etc.
- Research, library and referencing skills.
- How a technical journal judges an article for publication.
- Process for purchasing equipment and supplies.
- The importance of publication.
- Exposure through the conference medium.
- Intellectual property issues and responsibilities.

A transparent process, based on the University's PGR2 form system, will be clearly outlined to every incoming postgraduate student.

Each PhD student should typically have achieved:

- 1-2 journal papers submitted and accepted
  - 1-2 internationally refereed conference papers
- by the end of the student's studies.