

Quality Assurance / Quality Improvement
Programme for Academic Units
2004-2005



Quality Improvement Plan

for the

**School of Mechanical and Manufacturing
Engineering**

November 2005

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1. INTRODUCTION

1.1. Quality Self-Assessment Report

As part of Dublin City University's Quality Implementation Plan for 2004-2005, in the period of October 2004 – March 2005 the School of Mechanical and Manufacturing Engineering undertook a comprehensive self-assessment of its activities. The School's Self-Assessment Report was completed and submitted to the Director of Quality Promotion in February 2005. Copies of the Report were sent to all members of the Peer Review Group for evaluation.

1.2. Peer Review Group Report

In June 2004, the Standing Committee of Academic Council of DCU submitted a list of 12 candidates of the Peer Review Group (PRG). In December 2004 the DCU Quality Promotion Unit approved the following panel for the Peer Review Group:

- ◆ Prof. Alan Bramley: Head, Department of Engineering & Applied Science, University of Bath, Bath, England (Chair)
- ◆ Prof. Sean McNamara: Head, Department of Mechanical & Biomedical Engineering, National University of Ireland, Galway
- ◆ Mr Jim Lawler: Director, Industrial Technologies, Enterprise Ireland, Dublin
- ◆ Prof. Richard O'Kennedy: School of Biotechnology, DCU
- ◆ Dr. Anne Sinnott, DCU Business School (Rapporteur)

The Peer Review Group visited DCU and the School in 2-4 March 2005. They interviewed the School staff, University management, students, graduates and other stakeholders. The PRG produced their report and sent it to the Quality Promotion Unit. The PRG Report was sent to the Head of School in April 2005, who then made it available to all School staff.

In general, the PRG were satisfied with the Self-Assessment Report:

"Overall, the Review Group considered the Self-Assessment Report to be a highly detailed document which had clearly taken a huge amount of time and effort to put together.

The PRG found the self-assessment report to accurately represent all aspects of the work carried out by the School, including a good analysis of its strengths and weaknesses."

However, several questions and concerns were raised. They were summarised in a number of recommendations in the PRG Report.

1.3. Quality Improvement Committee

In order to identify areas where improvement could be made in the activities of the School and which were pointed out in the PRG Report, in May 2005 the School Quality Improvement Committee was established with the following members:

- Dr. Tamas Szecsi, senior lecturer (Chair)
- Dr. Joseph Stokes, lecturer
- Dr. Triona Lally, lecturer
- Mr. Liam Domican, senior technician
- Mr. Cian Merne, workshop technician
- Ms. Marie Ryan, senior faculty administrator assistant
- Ms. Suzanne Dockery, school secretary

1.4. Quality Improvement Plan

The main objective of the School Quality Improvement Committee (SQIC) was to evaluate the recommendations of the PRG and prepare a Quality Improvement Plan for the School. In connection with the recommendations of the PRG, the SQIC and the School organised a number of meetings and activities to develop the Quality Improvement Plan and Report:

On 4 February 2005, a structured discussion of the School Executive (SE) with the help of an external facilitator took place. The aim of the meeting was to analyse the structure and operation of the SE and to identify areas of improvements.

At its meeting on 16 March 2005, the Materials Processing Research Centre discussed its new strategic focus. It was agreed to use the same methodology when developing the Strategic Plan of the School.

At its meeting on 6 April 2005, the School Executive decided to develop a new Strategic Plan of the School for the period up to 2010.

On 9 May 2005, the School Executive organised a one day meeting to discuss the new School Strategic Plan of the School.

On 24 May 2005, the School organised an away day to develop a new Strategic Plan of the School and to discuss the questions raised by the PRG to develop the Quality Improvement Plan of the School.

The final version of the Strategic Plan of the School, compiled by the Research Convenor of the School, was circulated to all School members on 15 July 2005.

The draft version of the Quality improvement plan, compiled by the Chair of the SQIC, was circulated to all School members for comments on 16 August 2005.

The final draft version of the Quality Improvement Plan was sent to the Quality Promotion Unit of DCU on 29 August 2005. The QIP contains the responses of the School to the questions and recommendations of the PRG.

A meeting took place on 18 November 2005 to finalise the Quality Improvement Plan and to record the University response to the recommendations in the

presence of the Deputy President (Prof Albert Pratt), Dean of Faculty (Prof Charles McCorkell), Rapporteur (Dr Anne Sinnott), Senior Academic (Prof Richard O'Kennedy and one external member (Mr Jim Lawler) of the Peer Group, Head of School (Prof Saleem Hashmi), Chair of the School Quality Committee (Dr Tamas Szecsi) and the Director of Quality Promotion (Dr Heinz Lechleiter).

2. RESPONSE TO RECOMMENDATIONS IN THE PEER REVIEW GROUP REPORT

The PRG recommendations are laid out below. Each is given a priority. The meaning of the priority indicators is as follows:

- 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.

Additionally, the PRG has attempted to indicate the level(s) of the University where action is required:

- S: School of Mechanical and Manufacturing Engineering
- F: Faculty of Engineering and Computing
- U: University Executive/Senior Management

Where considered appropriate, action at multiple levels is recommended: this should be considered as inclusive, indicating a need for co-ordinated, complementary actions at *all* the indicated levels (rather than, e.g., at "any one level").

All recommendations of the PRG are grouped into four categories:

- ◆ Organisation and Management
- ◆ Programmes and Instruction
- ◆ Scholarship and Research
- ◆ Staffing, Accommodation and Resources

Recommendations in the Peer Review Group Report that were similar to the findings of the Self-Assessment Report are marked by '(SAR)'.

2.1. Organisation and Management

Recommendation in Peer Review Group Report	<i>Unit Response in Quality Improvement Plan</i>	
<p>P1-S (SAR): The School needs a new strategic review of its Course strategies; Research objectives; Organisational structure and philosophy; and requires a Management System to deliver on this strategic future.</p>	<p>The <u>School</u> developed its new strategic plan 'Engineering Strength: Strategy to 2010' in July 2005.</p> <p>The largest research group of the <u>School</u>, the Materials Processing Research Centre, developed its new strategic focus in March 2005.</p> <p>The <u>School</u> reaffirmed the structure of the School Executive in January 2005. The functions, roles and operational principles of the SE were updated and improved in February 2005.</p> <p>In February 2005, the School Executive decided to create a school Research Forum which would discuss research issues. The Forum includes the School research convenor, second School rep on the Faculty Research Board, and staff responsible for postgraduate liaison, training, research publicity, and a student representative.</p> <p style="text-align: right;">Timeline: Completed</p>	<p>The university supports the School's response and notes that the Head of School is now on the School Executive. It is recommended that a deputy chair should be put in place.</p>

<p>P1-F: The above review should be carried out as part of the development of Faculty Strategy. The development of the Faculty structure is both a challenge and an opportunity to both the school and faculty management</p>	<p>The Executive Dean of the new <u>Faculty</u> of Engineering and Design was appointed in June 2004.</p> <p>The <u>Faculty</u> Education Committee and Research Committee were formed in March 2005. Their Terms of Reference, Functions and Procedures, and the new Strategy Document of the <u>University</u> and the <u>Faculty</u> are currently under development.</p> <p style="text-align: right;">Timeline: 1 year</p>	<p>The university acknowledges that the development of a Faculty Strategic Plan is now a matter of priority.</p>
<p>P1-U: The challenge to the University is to choose to realise that potential</p>	<p>The <u>School</u> fully agrees with this.</p>	<p>The university fully agrees with this.</p>

2.2. Programmes and Instruction

Recommendation in Peer Review Group Report	<i>Unit Response in Quality Improvement Plan</i>	
<p>P1-S (SAR): The School should explore the market appeal of variations in the titling of the programmes. Medical and Bio terminology seems to be very attractive at other universities in the UK and Ireland. Perhaps the word "Mechanical" is inhibiting recruitment.</p>	<p>In May 2005, the <u>School</u> proposed renaming its existing undergraduate programme 'BEng in Medical Mechanical Engineering' as 'BEng in Biomedical Engineering'. In response, the Executive Dean proposed a meeting to discuss the implications of this for other possible unspecified future initiatives in the faculty.</p> <p style="text-align: right;">Timeline: 1 year</p>	<p>The university acknowledges that there is an ongoing debate within the Faculty in which the Faculty takes into consideration the wider picture in co-operation with the Schools, also with a view to streamlining teaching within the Faculty.</p>
<p>P1-S (SAR): A more formal system for gathering student feedback should be implemented coupled with the setting up of a staff-student liaison committee chaired and serviced by students. This will enable a continuous improvement system for all matters relating to teaching and research and improve the awareness of students of the various systems and procedures that are in place.</p>	<p>The new Strategic Plan of the School outlines 'measures to ensure excellent taught programme quality by introducing a new mechanism of feedback from student groups and their increased participation at programme boards. Web-based surveys will be conducted with class groups, discussed by class representatives and programme chairs, and subsequently presented by class representatives to programme boards'.</p> <p style="text-align: right;">Timeline: 1 year</p> <p>In February 2005, a new position of Postgraduate Liaison Officer was created by the <u>School</u> and is now operational. Their task is to improve community among, and communication with, postgraduate students. A small budget was set aside to cover organisational costs of meetings with postgraduate students.</p> <p style="text-align: right;">Timeline: Completed</p>	<p>The university appreciates that the problem has been recognised and is being addressed.</p>

<p>P2-SF (SAR): Some further rationalisation of the programme modules seems necessary to reduce the staff teaching loads. Consideration should be given to increasing the number of modules that are common across the programmes without detracting from the attractiveness of the denominated degrees.</p>	<p>In February 2005, the <u>Faculty</u> Education Board started the discussion of Faculty-wide optimisation of module delivery. A survey was performed by the Associate Dean for Education to identify overlapping and related modules delivered throughout the Faculty.</p> <p>The new Strategic Plan of the School outlines measures to be taken in order to reduce the teaching workload of staff by rationalising module delivery.</p> <p style="text-align: right;">Timeline: 5 years</p>	<p>The university is strongly in favour of efficiencies created by changes to rationalise teaching to be implemented Faculty-wide.</p>
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2.3. Scholarship and Research

Recommendation in Peer Review Group Report	<i>Unit Response in Quality Improvement Plan</i>	
<p>P1-SFU (SAR): Review, consolidate and develop Research Groupings of a critical mass to maximise ability to compete effectively at University/National/International levels. This may require strategic alliances between the Schools within the Faculty and across the University.</p>	<p>During the development of the new Strategic Plan of the <u>School</u> it was agreed to concentrate research effort in three strategic research areas: Innovative Manufacturing, Biomedical Engineering, and Sustainable/Green Technologies. In line with this focus the School is engaged in reviewing, consolidating and developing research groupings of a critical mass (including alliances outside the school). It also targets publications in a range of high impact journals, targets funding for key conferences in context of the focus, invites high profile researchers in these areas to visit and get to know us and pursue funding opportunities in these areas.</p> <p>With this aim, a Development Officer will be appointed in Year 2 or 3 of the Strategic Plan to positively impact on proposal submissions.</p> <p style="text-align: right;">Timeline: 5 years</p>	<p>It is noted as a positive development that strategic research areas have been identified and put into action.</p>
<p>P1-S (SAR): Clarify procedures for obtaining School-based financial support for research and effectively exploit all external funding programmes available. This is essential in the current financial situation to maintain existing levels of research and to make significant progress in the future.</p>	<p>Having established the School Executive and the new Research Forum of the School, combined with improved communication between staff, allows the <u>School</u> to put in place a transparent decision making process.</p> <p style="text-align: right;">Timeline: completed</p>	<p>The university appreciates the progress made in this respect.</p>
<p>P1-S (SAR): Review and optimise procedures to ensure recruitment of high quality postgraduate students both nationally and internationally.</p>	<p>According to the new Strategic Plan, the <u>School</u> 'will target external schemes which fund excellent postgraduate level researchers'. Students required to qualify for the research Masters register will henceforth complete</p>	<p>Progress made is appreciated by the university.</p>

	<p>qualification prior to starting research. Applications from prospective students are reviewed and vetted by a panel of School academics. Historical data on international students (entry qualification/progress) will be gathered. Mechanisms to do these reviews have been put in place.</p> <p>Timeline: completed</p>	
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Recommendation in Peer Review Group Report	<i>Unit Response in Quality Improvement Plan</i>	
<p>P2-S (SAR): Aim to increase both quality and numbers of research papers in high quality international journals. This is necessary to enhance the Schools national /international standing in research.</p>	<p>In order to increase research quality, and in line with the new Strategic Plan of the School for projects not vetted by external/internal funding bodies, the <u>School</u> has put processes in place to ensure high quality of the proposed work, supervisor suitability, and alignment with School focus. Problems of poor student commitment, progress, or writing skills are dealt with at an early stage through a review process linked to first year progress report forms, and sets targets (with timescales) for publication output from postgraduate researchers. Postgraduates are supported through involvement in seminars for researchers working on a specific theme.</p> <p>In order to facilitate more and better research papers time has been freed up for academics to work on research (reduced administrative load, rationalised teaching commitments, research day(s) in the timetable).</p> <p>The <u>School</u> will implement a research visitor programme (short stay of senior researchers). This will enhance national and international collaboration of the School staff in key research areas.</p> <p style="text-align: right;">Timeline: 5 years</p>	<p>The university sees this as a central issue and supports and encourages an intensification and diversification of research output.</p>

<p>P1-SFU: New senior appointments should be made in strategic areas to strengthen School's research profile.</p>	<p>The <u>School</u> needs to have staff promoted to senior positions in strategic research areas of the School.</p> <p>The <u>School</u> is actively pursuing the permanent replacement of a previous senior lecturer of the School in the Biomedical area.</p> <p style="text-align: right;">Timeline: 1 year</p>	<p>The university encourages the Faculty to put forward suggestions for appointments at senior level in strategic areas.</p>
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2.4. Staffing, Accommodation and Resources

Recommendation in Peer Review Group Report	<i>Unit Response in Quality Improvement Plan</i>	
<p>P1-U (SAR): Address the poor senior to junior staff ratio</p>	<p>The new Strategic Plan of the <u>School</u> outlines the target figures for School staffing by 2010: to secure the permanent position of 17 academic, 10 technical and one secretarial staff. The academic staff should include one professor, two associate professors and four senior lecturers. This would greatly improve the senior to junior staff ratio, and is consistent with <u>University</u> guidelines on this ratio.</p> <p>Several staff members have shown interest and ambition to be promoted.</p> <p style="text-align: right;">Timeline: 5 years</p>	<p>The university acknowledges that the School has expanded in a relatively short time frame. It pays tribute to the School for developing its staff internally.</p> <p>The university promotion system provides for promotion of staff on a competitive basis.</p> <p>Comment from external peer Jim Lawler: "The school has responded and the University acknowledges this. However there is no suggestion that anything proactive will be done to move to the desirable balance. "</p>
<p>P2-U (SAR): Provision should be made for the promotion and reward of technical staff.</p>	<p>As laid out in the new Strategic Plan:</p> <p>'We will retain our current technical staff numbers over the term of this plan and will aim to motivate them through area specific training, acknowledgement and recognition. Training will be aligned with our overall research strategy and aim to produce specialised technicians in key areas. We will encourage and acknowledge technical staff input to teaching laboratory and research development. '</p> <p>'Support, development and promotion of technical support staff is of key importance to delivering on the School strategy. Staff retention is a specific challenge and our aim is to introduce senior positions within the mechanical engineering workshop and specific research areas.' The Strategic Plan of the School targets</p>	<p>There are efforts under way to solve the problem within the university system on a nation-wide basis.</p>

	the appointment of a second Senior Technician. Timeline: 5 years	
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Recommendation in Peer Review Group Report	<i>Unit Response in Quality Improvement Plan</i>	
<p>P2-U (SAR): A structured equipment support plan is required.</p>	<p>'It will be important to set aside or secure externally a budget allocation for maintenance and upkeep of existing equipment (including servicing and calibration) and for replacement of old and redundant equipment. Sources to be investigated include Faculty funds, OVPR equipment maintenance funds and the inclusion of service contract funding in external research proposals.'</p> <p>'Capital expenditure (where discretionary) will be broadly in line with our research themes outline previously. This will allow the development of research labs with key equipment to enhance the success of future research proposals.'</p> <p>'The <u>School</u> will endeavour to secure changes to the <u>University</u> budgetary model to recognise necessary costs associated with the key mechanical engineering workshop facility. This facility is vital to maintaining quality of all School teaching and research activities. The current weighting used in budget calculations results in a scenario where there will be no funds to run this facility, and is not sustainable.'</p> <p>'Our IT support to staff, students and postgraduates is second to none and our range of software available for teaching and research is state-of-the-art. This facility is core to our day to day operation and very attractive to potential students. Our aim is to remain ahead of our competitors in this area and to upgrade our facilities on a 5 years basis. This can only be achieved through external funding or successful sponsorship of our computer facilities. We remain open to possible merits in integrating aspects of</p>	<p>The university accepts the recommendation. This is, however, a considerable problem throughout the university sector. Putting an equipment support plan in place depends to a great extent on the overall funding situation.</p>

	<p>IT operations with other Schools in the Faculty. ' Some funds for research equipment have been made available under the <u>University</u> Overhead Investment Plan. However, they are limited, and the <u>School</u> will lobby the University to consider these costs in budget allocation.</p> <p style="text-align: right;">Timeline: 5 years</p>	
<p>P1-S: Make better use of the space in both buildings to facilitate better integration of teaching, research and effectiveness of technical support.</p>	<p>In February 2005, the <u>School</u> made several offices in the new engineering building available for postgraduate and post doctorate researchers. It has been decided that three labs be relocated from Albert College into the new engineering building.</p> <p style="text-align: right;">Timeline: 1 year</p>	<p>The university supports the co-ordinated approach within the Faculty to allocate space on an optimal basis.</p> <p>"The essential point here is the desirability of interaction between under and post-graduate activity. " (Comment from external peer, Jim Lawler)</p>

3. PRIORITISED RESOURCE REQUIREMENTS

1. Funding for the relocation of research labs from Albert College to the new Engineering Building. This is in line with the recommendation of the PRG to make better use of existing space in the engineering building. Costs include moving equipment and refurbishing labs.

Estimated cost: €150,000

2. Should this amount not be available, it would be necessary to fund the refurbishing of research labs in Albert College. One of the findings of the PRG was that the facilities in most of the research labs in Albert College are not adequate, and if the move of the labs to the Engineering Building is not possible, they need to be improved.

Estimated cost: €60,000

3. Funding the appointment of a Research Development Officer for a 1.5 year period to positively impact on proposal submissions in key research areas.

Estimated cost: €80,000

4. Funding for a research visitor programme (short stay of senior visiting researchers) to underpin new research themes.

Estimated cost: €30,000

5. Printing of new promotional materials for changed undergraduate and new postgraduate programmes, and for new research groups and themes.

Estimated cost: €5,000

Total funding requirement: €265,000

The university response in relation to 1) is that this is a worthwhile investment which, however, can not be funded out of the Quality Improvement Fund. In relation to 2) that it is recommended that a strong argument be made to the Budget Committee. In relation to 3), 4) and 5) that these projects are outside the Quality Improvement Fund capacity but that the OVPR Moveability Fund could play a positive and seminal role in relation to 4.

4. SUMMARY OF THE ONE-YEAR PLAN

At School Level:

Within the 2005/2006 year, the School:

- ◆ Has introduced a new mechanism of feedback from student groups and their increased participation at programme boards.
- ◆ Will discuss and decide on rename the existing BEng in Medical Mechanical Engineering programme into BEng in Biomedical Engineering, include it into the 2006/2007 publications, and advertise it.
- ◆ Has enhanced its system of ensuring quality of research students and projects.
- ◆ Has decided to relocate some of its research labs from Albert College into the new Engineering Building (subject to available space and funds).
- ◆ Will refurbish some of its research labs in Albert College (subject to available funds).
- ◆ Has developed a Academic Workload Document which will be kept under review.

5. SUMMARY OF THE FIVE-YEAR PLAN

At School level

Within the period 2005-2010, the School will:

- ◆ Explore the feasibility of, and develop if appropriate, a new postgraduate taught programme in the biomedical and pharmaceutical area.
- ◆ Exploit opportunities for industry focused short programmes at postgraduate level.
- ◆ Take measures to reduce the teaching workload of staff by rationalising module delivery.
- ◆ Concentrate research efforts in three strategic research areas: Innovative Manufacturing, Biomedical Engineering, and Sustainable/Green Technologies.
- ◆ Appoint a Research Development Officer to assist with targeted funding proposals aligned with the strategic focus of the School (funds permitting).
- ◆ Implement a research visitor programme (funds permitting).
- ◆ Develop a transparent system for allocating School-based research funds.
- ◆ Increase the number and quality of its research publications.
- ◆ Make efforts to secure the permanent position of 17 academic, 10 technical and one secretarial staff. The academic staff should include one professor, two associate professors and four senior lecturers.
- ◆ Implement the University scheme on reward and recognition of non-academic staff.

APPENDIX ONE: Personnel involved in the Quality Review process

Below is given the membership of:

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

Dr. Tamas Szecsi	Senior Lecturer (Chair)
Dr. Joseph Stokes	Lecturer
Dr. Triona Lally	Lecturer
Mr. Liam Domican	Senior Technician
Mr. Cian Merne	Workshop Technician
Ms. Marie Ryan	Senior Faculty Administrator Assistant
Ms. Kathleen Donohoe	School Secretary

- **Peer Review Group**

Prof. Alan Bramley: Head, Department of Engineering & Applied Science, University of Bath, Bath, England (Chair)

Prof. Sean McNamara: Head, Department of Mechanical & Biomedical Engineering, National University of Ireland, Galway

Mr Jim Lawler: Director, Industrial Technologies, Enterprise Ireland, Dublin

Prof. Richard O'Kennedy: School of Biotechnology, DCU

Dr. Anne Sinnott, DCU Business School (Rapporteur)

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

Dr. Tamas Szecsi	Senior Lecturer (Chair)
Dr. Joseph Stokes	Lecturer
Dr. Triona Lally	Lecturer
Mr. Liam Domican	Senior Technician
Mr. Cian Merne	Workshop Technician
Ms. Marie Ryan	Senior Faculty Administrator Assistant
Ms. Suzanne Dockery	School Secretary