# Quality Assurance / Quality Improvement Programme



## Peer Review Group Report

## *Faculty of Engineering & Computing*

### Peer Review Group members

1. Prof. Ahmed Al-Shamma'a, Executive Dean, Faculty of Engineering and Technology, Liverpool John Moores University.

2. Prof. Eileen Harkin-Jones OBE, Bombardier-Royal Academy of Engineering, Chair in Composites Engineering, University of Ulster

3. Mr. Tadhg O'Shea, Vice president of software engineering/development management, Fidelity Investments Ireland

4. Mr. Gerard McEvoy, Acting Head of Estates, Dublin City University (Rapporteur)

5. Prof. Colette McDonagh, School of Physical Sciences, Dublin City University

## DATE: 22 April 2016

**Introduction**

This Quality review has been conducted in accordance with a framework model developed and agreed through the Irish Universities Association Quality Committee and complies with the provisions of Section 35 of the Universities Act (1997) and the 2012 Qualifications and Quality Assurance Act. The model consists of a number of basic steps.

1. An internal team in the School/Faculty/Office/Centre being reviewed completes a detailed self-assessment report (SAR). It should be noted that this document is confidential to the School/Faculty/Office/Centre as well as the Review Panel and senior officers of the University.
2. This report is sent to a team of peer assessors, the Peer Review Group (PRG) – composed of members from outside DCU and from other areas of DCU – who then visit DCU and conduct discussions with a range of relevant staff, students and other stakeholders.
3. The PRG then writes its own report. The School/Faculty/Office/Centre is given the chance to correct possible factual errors before the PRG report is finalised.
4. The School/Faculty/Office/Centre produces a draft Quality Improvement Plan (QuIP) in response to the various issues and findings of the SAR and PRG reports.
5. The PRG report and the draft QuIP are considered by the Quality Promotion Committee (QPC) and University Executive.
6. The draft QuIP is discussed in a meeting between the School/Faculty/Office/Centre, members of the PRG, the Director of Quality Promotion and members of Senior Management. The University's responses are written into the draft document and the result is the finalised QuIP.
7. The PRG Report and the QuIP including the University's response is sent to the Governing Authority of the University, who approve publication in a manner that it sees fit.

   This document is the report referred to in Step 3 above.

**Peer Review Group Report for the Faculty of Engineering & Computing**

## 1.    Introduction and Overview

Location

The Faculty of Engineering and Computing administrative offices, academic offices and laboratories are located across a number of buildings on Glasnevin Campus including the Stokes Building, the McNulty Building, the Marconi Building, the Albert College and the Hamilton Building. The Faculty's space envelope is approximately 11685m2 .

The Faculty administration team, which provides support for the 3 Faculty Schools, occupies a shared space on the 1st floor of the McNulty Building.

Staff

| Role | 2011 | 2012 | 2013 | 2014 | 2015 |
|------|------|------|------|------|------|
| Administrative Support | 17 | 22 | 23 | 30 | 28 |
| Lecturer/Senior Lecturer | 57 | 55 | 54 | 58 | 56 |
| Postdoctoral Researcher | 46 | 69 | 89 | 83 | 60 |
| Professor/Associate Professor | 12 | 12 | 12 | 13 | 13 |
| Research Assistant | 9 | 28 | 35 | 30 | 21 |
| Technical Support | 24 | 27 | 28 | 24 | 32 |
| **Total** | 165 | 213 | 242 | 239 | 211 |

Functions / Activities

The Faculty of Engineering and Computing was established in 2004, incorporating the schools of Mechanical and Manufacturing Engineering, Electronic Engineering, and Computing. The goal of the Faculty is to make a significant contribution to society, locally, nationally, and internationally through the capabilities of its graduates, the scholarly output and commercial derivatives of its research, professional influence, and continuing education and professional development. To that end the Faculty is a scholarly community dedicated to the discovery and dissemination of knowledge in selected areas of Engineering and Computing, and engagement with significant national and global opportunities.

The Executive Dean of the Faculty provides leadership and direction, and serves as the official representative of the Faculty. He is responsible for strategic planning within the Faculty and the general leadership of all of its activities. He is the Faculty's Accounting Officer and is responsible, through the Deputy President, to the President, for the financial and budget planning, implementation and monitoring within the Faculty and its constituent Schools.

The Heads of School and Research Centres formally attached to the Faculty, report to and through the Dean.

Membership of the Faculty consists of all permanent staff of constituent units (Schools and Faculty Office) and those staff members who hold a full temporary contract of one or more years of duration, approved by the Dean.

The Faculty has two Associate Deans; the Associate Dean for Education and the Associate Dean for Research, both of whom report directly to the Dean. The Associate Dean roles are part-time. The Associate Deans for Research and Education provide assistance to the Executive Dean by chairing their respective committees, formulating Faculty strategy in Education and Research and deputising for the Executive Dean when necessary, amongst other duties.

Each Associate Dean has responsibility for a constituted Faculty committee, and each of these two committees report to Faculty Management Board (FMB). The Faculty has ensured across all of its constituted committees appropriate representation of staff and of students, where relevant.

## School Committee Structure

Each School has a Teaching Committee overseeing the school's undergraduate and postgraduate teaching activities.
Each School also has a Research Committee overseeing the school's research activities.

## Programme Boards

Every taught programme within the Faculty is overseen by a Programme Board. Programme Board membership consists of all academic staff who teach onto the programme and student representatives. The Programme Chair (Chairperson) is appointed by the relevant Head of School; or in the case of programmes substantially spanning Schools, by agreement between the relevant Heads or by rotation.
Programme Boards report to the Faculty Committee for Education.

## School Management

The management of each school is based on the following structures:
Head of School, who reports directly to the Dean, has overall management responsibility for their school, including line management of all staff. The role is operated on a three year rotation. Currently the Headship role in the School of Electronic Engineering is undertaken by a three person School Executive, including an Acting Head, all appointed by the Dean.
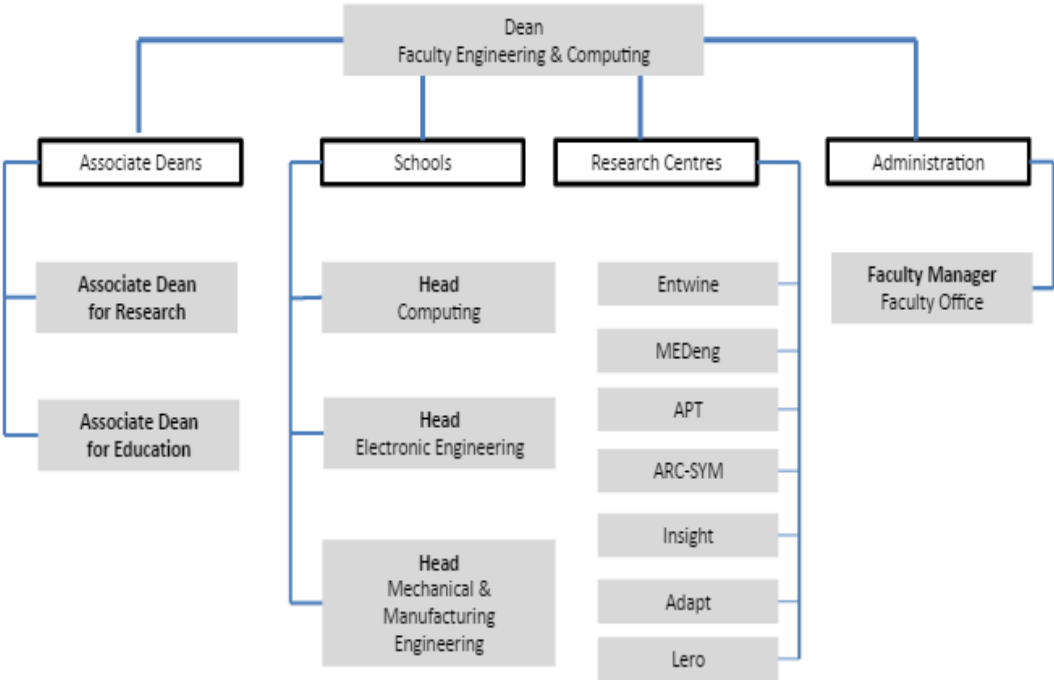School meetings are held regularly, as a means of information exchange and ratification of school policy changes.

## Research

The Associate Dean for Research chairs the Faculty Committee for Research (FCR), which oversees all Faculty research activities. Membership includes one research convenor from each of the three schools, three representatives, one each, from three of the Faculty's research centres, one post-doctoral research staff member and one postgraduate research student. The Faculty Committee for Research promotes competitiveness and sustainability, maintaining appropriate academic standards and operating with the highest standards of ethics, fairness, transparency and equality. In general, the role of the Faculty Committee for Research is to deal

strategically with issues of operational effectiveness, collaboration, innovation, access and quality promotion through the process of consultation and recommendation.

Faculty Organisational Structure:

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                         Dean
                 Faculty Engineering & Computing

   Associate Deans        Schools      Research Centres      Administration


  Associate Dean           Head           Entwine          Faculty Manager
   for Research          Computing                           Faculty Office

                                           MEDeng

                                            APT
  Associate Dean           Head
  for Education     Electronic Engineering  ARC-SYM

                                           Insight
                          Head
                       Mechanical &        Adapt
                       Manufacturing
                        Engineering         Lero
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## 2. The Self-Assessment Process

<u>The Co-ordinating Committee</u>

| | |
|---|---|
| Renaat Verbruggen | School of Computing *Chair* |
| Suzanne Little | School of Computing |
| Pascal Landais | School of Electronic Engineering |
| Ronan Scaife | School of Electronic Engineering |
| Bryan McDonald | School of Mechanical and Manufacturing Engineering |
| Paul Young | School of Mechanical and Manufacturing Engineering |
| Karen Keating | Faculty Office |
| Paul Wogan | Faculty Services Committee |
| Barry McMullin | Executive Dean (*ex officio*) |

<u>Methodology adopted during process</u>

The Faculty Quality Review Working Group was established and charged with the central responsibility of planning and implementation of the review and developing the SAR. The faculty review was developed based on the latest guidelines set out by the Quality Promotion Office of the University[1]. The major change since the last review and the 2010 process was the emphasis on Faculty rather than individual School views. In conjunction with this, given that prior reviews have occurred, the Self-Assessment Report was limited to approximately 50 pages of reflection and analysis with sufficient background to give a context, but with further detail available in appendix material and through online links.

The Faculty Quality Review Working Group (FQRWG) was established containing two members nominated from each of the constituent schools, a representative of the Faculty Office, a member of the Technical staff and the Dean (ex officio). This group met physically on a monthly basis, and reviewed and discussed content weekly online. Each of the members helped to guide the gathering of local information and contributed this to the overall faculty review. The manner in which this was done was not pre-specified in detail but rather allowed to develop in an agile manner based on local judgement in each area.

There was an organised "away day" by the School of Mechanical and Manufacturing Engineering (MME) and internal meetings by the Faculty Office (FO) and the School of Electronic Engineering (EE) to establish a set of issues expressed as Strengths, Weaknesses, Opportunities and Challenges. Others used a review and comments approach based on the issues that were developed by the working group.

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[1] DCU Quality Promotion Office: http://www.dcu.ie/qpo/

A Faculty-level event was also organised, facilitated by an external consultant, bringing together the Faculty Executive Board (FEB: Dean, Associate Deans, heads of School, Faculty Manager) and the working group to examine the overall Faculty view on the SWOC analysis.

The Associate Deans for Education and for Research prepared Sections 7 and 8 respectively with input from the relevant Faculty committees, the quality review working group, and the various Faculty research centres. The complete draft text was circulated to all Faculty members for review and comment. Revisions were co-ordinated by the working group. The text was subject to review by the Faculty Executive Board and final review and approval by the Dean in consultation with the working group Chair.

## 3. The Peer Review Group Process

<u>The Review Group</u>

1. Prof. Ahmed Al-Shamma'a, Executive Dean, Faculty of Engineering and Technology, Liverpool John Moores University.

2. Prof. Eileen Harkin-Jones OBE, Bombardier-Royal Academy of Engineering, Chair in Composites Engineering, University of Ulster

3. Mr. Tadhg O'Shea, Vice president of software engineering/development management, Fidelity Investments Ireland

4. Mr. Gerard McEvoy, Acting Head of Estates, Dublin City University (Rapporteur)

5. Prof. Colette McDonagh, School of Physical Sciences, Dublin City University

<u>Site Visit Programme</u>

## Quality Review of: Faculty of Engineering and Computing
## Date: 20<sup>th</sup> – 22<sup>nd</sup> April 2016

| Day | Time | Peer Review Group (PRG) Activity/Meeting | Venue | Meeting No. |
|---|---|---|---|---|
| **Day 1 Wed** | 12.30-14.00 | Lunch with Director of Quality Promotion and available PRG members | 1838 DCU | Arranged by QPO |
| | 14.00-15.00 | Briefing by Director of Quality Promotion; Guidelines provided to assist PRG during the visit and in developing its report. | A204 | |
| | 15.00-15.15 | Briefing on use of Guru student information system (Guru project manager) | A204 | 1 |
| | 15.15-16.00 | PRG selects Chair. Discussion of main areas of interest and/or concern arising from the Self Assessment Report (SAR). | A204 | |
| | 16.00-16.15 | *Coffee* | A204 | Arranged by QPO |
| | 16.15-17.15 | Consideration of SAR with Executive Dean and members of quality review working group. Short presentation by Faculty followed by discussion of SAR. *(Director of Quality Promotion in attendance)* | A204 | 2 |
| | 17:15-17.55 | PRG Private meeting | A204 | |
| | 18.00-19.00 | Informal Reception – PRG, Executive Dean, Members of Quality Review Working Group, Director of Quality Promotion | 1838 DCU | Arranged by QPO |
| | 19.00-20.30 | PRG Dinner | 1838 DCU | Arranged by QPO |

| Day | Time | Peer Review Group (PRG) Activity/Meeting | Venue | Meeting No. |
|---|---|---|---|---|
| **Day 2 Thurs** | 08.45-09.00 | PRG Private meeting | S206-S209 | |
| | 09.00-09.20 | Executive Dean | S206-S209 | 3 |
| | 09.20-09.55 | Faculty Management Board | S206-S209 | 4 |
| | 10.00-10.25 | Faculty Education Committee | S206-S209 | 5 |
| | 10.30-11.00 | *Coffee* | S206-S209 | |
| | 11.00-11.25 | Faculty Research Committee | S206-S209 | 6 |
| | 11.30-11.55 | Faculty Facilities Committee | S206-S209 | 7 |
| | 12.00-12.25 | Research Centre Directors | S206-S209 | 8 |
| | 12.30-13.15 | Meeting with Heads of Schools | S206-S209 | 9 |
| | 13.15-14:00 | *Lunch* | S206-S209 | |
| | 14.00-14.50 | Open forum: academic and research staff | S206-S209 | 10 |
| | 14.55-15.25 | Open forum: administrative and technical staff | S206-S209 | 11 |
| | 15.30-16.10 | Students: undergraduate | S206-S209 | 12 |
| | 16:15-16:30 | *Coffee* | S206-S209 | |
| | 16.30-17.10 | Students: postgraduate (taught and research) | S206-S209 | 13 |
| | 17.15-17.55 | External stakeholders (alumni and industry) | S206-S209 | 14 |
| | 18.00-18.05 | Executive Dean (update and clarifications if required) | S206-S209 | 15 |
| | 18.05-18.15 | PRG private meeting time | S206-S209 | |
| | 19.30 | PRG private dinner | Crowne Plaza Hotel | |
| **Day** | **Time** | **Peer Review Group (PRG) Activity/Meeting** | **Venue** | **Meeting No.** |
| **Day 3 Fri** | 08.45-09.00 | PRG Private meeting | S206-S209 | |
| | 09.00-09.55 | DCU Senior Management Group (SMG) *(Director of Quality Promotion in attendance)* | AG01 Albert College | 16 |

| | 10.00-10.25 | President, Dublin City University | AG01 | 17 |
|---|---|---|---|---|
| | 10.30-11.00 | *Coffee* | | |
| | 11.00-13.00 | PRG private meeting time | S206-S209 | |
| | 13.00-14:00 | *Working Lunch*<br>Clarification of outstanding issues for PRG if required | S206-S209 | |
| | 14.00-16.25 | PRG Prepare Exit Presentation<br>*(Coffee provided at 16.00)* | S206-S209 | |
| | 16.30-17.00 | Exit Presentation – by PRG to all Faculty staff<br>*(Director of Quality Promotion in attendance)* | | 18 |

Schedule of Activity

The review visit was largely conducted according to the timetable provided by the Director of Quality Promotion (above) with all members of the PRG in attendance at all of the meetings.

The PRG elected to forgo the scheduled tour of faculty facilities in order to meet with the 3 heads of schools as it was felt this was an important aspect of the SAR and quality review. The timetable of meetings as presented above was, however, otherwise adhered to.

The PRG commend the thorough and intensive nature of the quality review process. Also commendable is the genuine and in-depth engagement with the process by DCU staff and external stakeholders as demonstrated in all of the meetings. The findings, commendations and recommendations contained in Section 4 are based on the discussions and meetings detailed in the Site Visit Programme (above).

Methodology

Following a presentation by the DCU Director of Quality Promotion providing an overview of the quality review process, to manage the process effectively, the PRG agreed upon a Chair for the group, Prof. Ahmed Al-Shamma'a, and assigned specific areas of responsibility to each member of the group.

Overall, the PRG was very impressed with the professional manner in which the visit was coordinated by the Faculty and Quality Promotion Office. Throughout the whole process staff, students and external stakeholders alike were open and forthcoming and engaged positively with the process.

The format of the site visit programme enabled the PRG to meet with most of the academic staff of the Faculty, a high proportion of the support staff and a representative group of other users/stakeholders including undergraduate and postgraduate students, postdoctoral researchers, employers, and staff in key support roles within the university. In addition, the opportunity to meet key members of the University senior management was welcomed and appreciated.

<u>View of the Self-Assessment Report</u>

The Self-Assessment Report (SAR) shows evidence of significant engagement with and commitment to, the quality review process by all members of the Faculty.

Data to support the development of the SAR was collected using a variety of methods including focus groups, interviews and surveying. As outlined in the SAR the Faculty representatives met frequently in order to determine what they wanted from the quality review and how best to achieve it. Appropriate appendices were provided and the PRG had access to all relevant information about the Faculty and the wider university setting

The SAR outlined the findings of the previous quality review carried out in 2010 and how the recommendations outlined at that time were addressed by the Faculty and action taken with particular focus on communication structures and leadership, increasing undergraduate student intake numbers, reviewing programme offerings and maintaining research activity.

Whilst the recommendations from the 2010 Quality Review were addressed clearly by the Faculty, the PRG would have found it beneficial to have commentary in relation to recommendations aimed at the University, and how progress is being monitored at an organisational level.

The Faculties SWOC analysis is comprehensive and in overall terms the PRG is of the view that the SAR is an accurate reflection of the activities of the Faculty and the service it provides. The PRG acknowledge the efforts by all within the Faculty of Engineering and Computing to engage with the development of the SAR.


## 4.    Findings of the Peer Review Group


<u>4.1 Staffing and Accommodation</u>
<u>4.2 Teaching and Learning</u>
<u>4.3 Research and Training</u>
<u>4.4 Overall Analysis of Strengths, Weaknesses, Opportunities and Concerns</u>


## 4.1    Staffing and Accommodation

During the visit it was noted by the PRG on several occasions that staff members across the Faculty were continuing to deliver in all areas since the previous review in 2010, while balancing the challenges of constrained budgets, increased student intake numbers leading to reduced staff to student ratios, and aging equipment. The PRG commends all staff for continuing to support and deliver the Faculty's goals, values and objectives.

During the PRG it was noted by a number of Post-Doctoral researchers that they had received minimum Induction when they joined the Faculty. Very little time was given to important Faculty processes and working practices such as the overall HR Procedures. The Review Group believe the initial introduction to an organisation is key to giving initial positive impressions to new staff and can help with overall employee engagement long term. It is recommended that

the Faculty put in place a comprehensive Induction Course covering all aspects of HR Procedures, Faculty Working Practices and Standards and expectations, roles and responsibilities for new staff joining the Faculty. (Recommendation 8)

In meeting with Academic staff a strong impression was given that when it came to promotions and advancements in their careers that more emphasis was placed on the Research element of their role rather than the Teaching. This resulted in the perception that certain Academic staff focused on Research and kept their Teaching duties to a minimum. Also the feeling was that the work & effort put into Teaching by other staff members was not valued appropriately. The Peer Review Group has recommended a review to ensure clear criteria in all three domains, in relation to academic promotions, and in particular to ensure that appropriate recognition is given to excellence in teaching. (Recommendation 9)

In the previous Peer Review Group report a recommendation was raised re the Promotion Process for Technical staff. In meeting with the Faculty Technical Staff it was raised as a concern that this recommendation had not been implemented. The Peer Review Group re recommend that this promotion recommendation from the previous quality review is implemented. (Recommendation 10)

## 4.2   Teaching and Learning

4.2.1 Overview of Programme Development, Student Experience and Teaching Quality

Since the last review in 2010, the Associate Dean of the Faculty and the Heads of the three constituent Schools have rationalised the undergraduate and postgraduate programme offerings. This move was partly motivated by external pressures relating to number of CAO applications and partly by resource limitations.The Faculty currently offers 8 denominated undergraduate programmes including a Common Entry into Engineering which is a non-award entry pathway.

The School of Computing has retained its flagship B.Sc. in Computer Applications programme and also offers a programme in Enterprise Computing and a newly launched programme (2015) in Computational Problem Solving and Software Development. A new and very topical programme in Data Science, in conjunction with the School of Mathematics, will be launched in 2016.

The School of Electronic Engineering (EE)  now offers a core undergraduate  programme in Electronic and Computer Engineering which was launched in 2015. This programme represents a re-structuring of three of the undergraduate offerings of the EE School (excluding Mechatronic Engineering) and has a series of majors in fourth year representing specialisms in very topical areas such as the Internet of Things and Digital Interaction

The School of Mechanical and Manufacturing Engineering (MME) offers 2 denominated programmes, Mechanical and Manufacturing Engineering and Biomedical Engineering. The programme in Mechatronic Engineering is offered jointly by the EE and MME schools Students

can enter all programmes in both Engineering Schools in Year 2 through the Common Entry route and are also free to enter all programmes in Year 1 through denominated entry.

For reasons stated above, the Faculty has retired 4 programmes. There has been a small increase in cut-off points for the Engineering programmes in recent years while the points for the Computing programmes have been effectively constant over the last 5 years.

The Faculty has also retired 4 taught M.Sc. programmes since the last Review and now offers 6 programmes at MSc and MEng level. Student numbers in these Masters programmes have been dropping over the last 5 years and the MME School is reviewing its approach to a 5-year Engineers Ireland-accredited integrated Master's programme in order to position the School more favourably in relation to competing institutions in the Dublin area. From discussions with academic staff, the PRG notes that the previous DCU taught postgraduate fee structure, whereby students had the limited options of registering either full time or for 2 years part time, has now been modified to allow a modular fee structure which will facilitate increased flexibility for students and should be more attractive to prospective students potentially leading to an increase in student numbers.

The Faculty and University are to be congratulated on the high quality of the student services and support. Services currently offered by the Faculty to incoming students include a valuable induction programme and tutor support for students experiencing difficulties in Year 1. The overall positive student satisfaction with these measures has been documented as part of the Irish Student Survey of Engagement for the academic year 2015-2016.

The Faculty implements a range of quality assessment and improvement mechanisms to monitor student opinion and to improve teaching and learning quality which include programme and module student surveys, professional accreditation processes, external examiner reports and annual programme reviews for all programmes. The outcomes of all these processes have been documented and inform Faculty and School decisions in relation to programme developments.

4.2.2   Main Findings of the PRG

- The retirement and merging of programmes and the introduction of new programmes based on student demand, market needs and other factors have been alluded to above. In the 5 years since the last review, there have been significant changes in terms of programme development. The PRG is of the opinion that the Faculty would benefit from establishing a well-defined Faculty-wide process for retiring existing programmes and initiating new programmes which would include extensive consultation with all stakeholders for example industry, professional bodies, academic, technical and administrative staff.(Recommendation 14)

- It emerged from both the SAR and meetings with staff that it was felt that the current minimum entry requirements for programmes in the Faculty are too low which impacts on student quality and student progression which, in turn, leads to issues with student retention. Furthermore, in the years since the last review, significant staff resources have been

invested in extra support for students experiencing difficulties, particularly in Years 1 and 2 which present challenges in the current resource-poor environment. For these reasons, it is recommended that the entry requirement across the Faculty be reviewed to ensure that entering students' academic history and achievement is reflective of the standard required on a programme, with a view to enhancing undergraduate progression rates. (Recommendation 12)

- From meeting with the students, the panel was impressed by the enthusiasm and commitment of both the undergraduate and postgraduate students. Generally, the undergraduates are very happy with their original programme choices and were unanimous in their view that INTRA was a very positive experience for all students involved and was one of the best aspects of the various courses. Furthermore, all students expressed a good degree of confidence about their job prospects on graduation. Notwithstanding the positive INTRA experience articulated by the students, the panel felt that a coordinated Faculty approach to INTRA should be developed to ensure continuing industry relevance across all programmes. (Recommendation 07)

- It emerged from both the student survey and from the meeting of the PRG with the undergraduate students, that, for some modules, there was a significant time delay, in some cases a matter of months, between the submission of an assignment and obtaining feedback and the grade from the module coordinator. For some modules, the student received timely and detailed feedback on assignments while for others, only the grade was forthcoming, and this could be after 2-3 months and no specific feedback was given. The PRG strongly recommends that module coordinators across the Faculty define a specific period of time, 15 working days is suggested as a reasonable period, during which time student work assessment and feedback would be completed. (Recommendation 17)

- The PRG notes that the undergraduates were very positive about the role of DCU clubs and societies in enhancing their experience outside their coursework. In particular, they appreciated the provision of dedicated social space in the Faculty for joint use by the RedBrick Society and the Engineering Society.

- The postgraduate students with whom the PRG interacted praised the state-of-the-art research facilities available to them and the excellent supervision provided by Faculty academics. They also valued the experience acquired in tutoring and laboratory demonstrating.

- The panel was very impressed with the student project Expo event as it was felt that showcasing student project work is a valuable marketing tool. Currently the focus is on showcasing to companies/prospective employers whereby 300-400 companies are invited and ~30% attend. The PRG felt that the event could be expanded to include prospective students and perhaps parents, in order to exploit the event as a recruitment forum. (Recommendation 13)

- The panel had discussions with both Research Centre Directors and Heads of Schools in the context of exploiting both the human resource expertise and infrastructure of the Centres to enhance the undergraduate experience in the Faculty in relation to research informed teaching. In addition to providing access to key facilities/equipment and expertise by project students and INTRA students, it was felt that increased participation by experienced research staff in undergraduate lecturing   would make a valuable contribution to all Schools by providing additional resources. It was felt that better communication between the Centre Directors and Heads of School would facilitate more mutually beneficial interactions. The panel is aware that some Centre researchers are already embedded in the teaching structure and, in order to increase the level of interaction, recommends the establishment of a framework of partnership within the Faculty.  (Recommendation 6)

## 4.3    Research & Training

Research in the Faculty of Engineering & Computing at DCU covers a wide range of topics from Data Science to Advanced Engineering Materials to Medical Engineering. There are 8 research centres (Insight, ADAPT, Lero, Advanced Processing Technology Research Centre, Centre for Medical Engineering, RINCE, Entwine, ARC-SYM) within or affiliated with the Faculty and the Centre Directors are staff members of the Faculty. At university level, overall research strategy is developed by the Vice President for Research & Innovation while at Faculty level the Associate Dean for Research (ADR) provides leadership to achieve Faculty research goals. The Faculty Committee for Research is composed of representatives from the research centres and the schools and is chaired by the ADR.

Research in the Faculty is in a robust state in terms of funding with approximately €157k per academic staff FTE per annum over the past 6 years. The level of funding from SFI is particularly impressive at 48% of the total funding stream. The Faculty has a healthy PDRA population (60 in 2015). Publications per FTE academic staff has dropped from 6.5 to 4.6 between 2012 and 2015 but this is still at a satisfactory level. Data on the quality of publications was not provided in the SAR but there are targets set internally in relation to publishing in the top quartile of journals. The level of research active staff is currently at 63% average over the three schools ranging from 53% in Computing to 93% in MME. The number of PhD students has dropped from 192 to 106 between 2011/12 and 2015/16. This is a significant drop and is attributed to (i) drop in funding for PhD students via SFI/IRC and (ii) buoyant job market for graduates which is reducing the potential pool of candidates. The PRG is of the view that action is required to address this decline in numbers and recommends that new initiatives are developed to enhance PhD student numbers in partnership with other faculties including the business school (Recommendation number 16).

During discussions with the research centre directors it was noted that there is great enthusiasm to allow PDRAs to support the Schools in the Faculty in teaching and other activities. This would be of benefit to the PDRAs in terms of career development and the desire for such opportunities was voiced by a number of PDRAs during interviews with the PRG. The PRG recommendation that a framework of partnership between Schools, Faculty and Research Centres is developed

to maximise limited resources would also provide opportunities for PDRA development. (Recommendation 6).

A key point to note from the PRG interviews with research students was the very high degree of satisfaction with the research supervision being provided and with the research facilities and equipment.

It was noted during the PRG interview with industry representatives that research quality is very important to industry and having an input into driving the outputs of research, through the advisory board(s), is important.

**4.4    Overall analysis of Strengths, Weaknesses, Opportunities and Concerns**

| STRENGTHS | WEAKNESSES |
|---|---|
| <ul><li>A genuine strong culture of collegiality exists across the Faculty</li><li>IT innovation is very strong e.g. Guru</li><li>Strong ties with Industry Partners exist</li><li>The Student experience is very positive</li><li>Research output has strong alignment with University Strategic plan</li><li>Teaching and support is an extremely high standard throughout the Faculty</li></ul> | <ul><li>High student to staff ratio</li><li>Faculty identity requires further development</li><li>Effectiveness of resources across the Faculty requires review</li><li>Succession planning for Heads of schools requires review</li><li>Weak tail of student cohort requires review</li></ul> |
| OPPORTUNITIES | CHALLENGES |
| <ul><li>Strong programme industry relevance can have a major impact addressing societal issues</li><li>The DCU Innovation Alpha campus provides an opportunity and unique platform to further develop industry ties and interaction</li><li>Use final year Expo as a tool for undergraduate recruitment and enhancement of second level links</li><li>Investigate and develop initiatives aimed at increasing PhD student numbers in partnership with other Faculties</li></ul> | <ul><li>Need to develop a plan to build PhD student population to retain sufficient numbers to support Faculty objectives</li><li>Minimum entry requirements and student capability for some programmes requires review</li><li>Consider a co-ordinated faculty approach with Industry Partners</li><li>Consistency with feedback on student assessment</li><li>Aging equipment and instrumentation versus availability of funding</li></ul> |

## 5. Recommendations for Improvement

**Indication of Priority:**
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 time scale.
P3: A recommendation which merits serious consideration but which is not considered to be critical to the quality of the ongoing activities.

**Level(s) of the University where action is required:**
A: Area under review
U: University Senior Management

| No. | Priority | Level | Recommendation |
|-----|----------|-------|----------------|
| | | | **Organisation and Management** |
| 1 | P2 | A/U | Review and implement, where appropriate, a LEAN approach to streamlining processes within the faculty and interactions with central support units e.g. a simpler implementation of digital sign off on expenses. (P1) |
| 2 | P2 | U/A | Implement an annual staff feedback survey within the faculty, as a means of identifying and progressing ongoing issues raised by staff |
| 3 | P1 | U | Develop a framework to support and appropriately recognise succession planning for Heads of School within the faculty. Additionally, consider the identification and appointment of a recognised Deputy Head role within each school. |
| 4 | P2 | U | Convene a working group to identify issues, and plan the implementation of enhancements to the DCU website, addressing in particular structural and usability issues. |
| 5 | P1 | A | Initiate a cross-faculty forum to review and develop an enhanced and coherent faculty identity, drawing on the experiences of both academic, administrative, technical staff and students. |
| 6 | P1 | A | Develop a framework of partnership between Schools, Faculty and Research Centres, to explore resource sharing in order to maximise the effectiveness of resources within the faculty. |
| 7 | P1 | A | In consultation with industry partners, review the INTRA programme across the faculty to maintain its competitiveness |
| | | | **Staffing and Accommodation** |
| 8 | P3 | A/U | Review of staff induction process, with particular reference to faculty processes, induction content and communication. |
| 9 | P1 | U | Ensure, when implementing the existing policy on staff progression |

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| | | | and promotion, that teaching excellence is not overlooked, and criteria are transparent, and appropriately reflect excellence in all areas |
| 10 | P2 | U/A | Address the Technical staff promotion recommendation from previous quality review |
| **Management of Financial and other Resources** | | | |
| 11 | P1 | A | Review existing equipment/instrumentation and implement a lifecycle funding model. |
| **Academic Programmes, Teaching & Learning** | | | |
| 12 | P1 | A | Establish appropriate, evidence-based entry requirements across the faculty to match student capability to course demands. |
| 13 | P1 | A | Extend the final year student Expo to include the hosting of prospective students and their parents, as a tool for undergraduate recruitment. |
| 14 | P1 | A | Establish an inclusive and transparent process for retiring existing programmes and initiating new programmes which includes consultation with relevant internal and external stakeholders. |
| 15 | P1 | A | Develop a co-ordinated Faculty approach to industry interaction to ensure continuing industry relevance of programmes. |
| **Research & Training** | | | |
| 16 | P1 | A | Explore new initiatives aimed at increasing PhD student numbers in partnership with other Faculties, e.g. the DCU Business School, or nationally and internationally via dual PhD Programmes. |
| **Student/Staff Perspective** | | | |
| 17 | P1 | A | Develop a policy on feedback of student continuous assessment, including guidelines on the time between submission of work and feedback, suggested max 15 working days, and the quality of the feedback provided. |

**Appendix**

### Meetings with Peer Review Group – Quality Review Visit
### Faculty of Engineering and Computing

| Meeting No: | Name(s) | Position |
|---|---|---|
| 1 | Mr David Molloy<br>Professor Barry McMullin | Project Manager, Guru project<br>Executive Dean |
| 2 | **Faculty Quality Review Working Group:**<br>Mr Renaat Verbruggen<br>Ms Karen Keating<br>Mr Paul Wogan<br>Dr Pascal Landais<br>Dr Ronan Scaife<br>Dr Bryan MacDonald<br>Dr Paul Young<br>Dr Suzanne Little | <br><br>School of Computing - Chair<br>Faculty Administration<br>Faculty Technical<br>School of Electronic Engineering<br>School of Electronic Engineering<br>School of Mechanical & Manufacturing Engineering<br>School of Mechanical & Manufacturing Engineering<br>School of Computing |
| 3 | Professor Barry McMullin | Executive Dean |
| | **Informal Reception:**<br>**Peer Review Group**<br>Professor Eileen Harkin-Jones<br>Professor Ahmed Al-Shamma'a<br>Mr Tadhg O'Shea<br>Professor Collette McDonagh<br>Mr Gerard McEvoy<br>**Quality Promotion office**<br>Ms Aisling McKenna<br>**Faculty Staff**<br>**Faculty Executive**<br>Professor Barry McMullin<br>Ms Michele Pringle<br>Dr Joseph Stokes<br><br>Professor Rory O'Connor<br>Dr Conor Brennan<br>Dr Brian Corcoran<br>Dr Mark Roantree<br><br>**Faculty Quality Review** | <br><br>University of Ulster, Jordanstown.<br>Liverpool John Moores University, Liverpool<br>Fidelity Investments, Dublin<br>School of Physical Sciences, DCU<br>Estates Office, DCU [Rapporteur]<br><br>Director of Quality Promotion<br><br><br>Executive Dean<br>Faculty Manager<br>Head of School, School of Mechanical & Manufacturing Engineering<br>Head of School, School of Computing<br>Acting Head of School, School of Electronic Engineering<br>Associate Dean for Education<br>Associate Dean for Research |

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| | **Working group** | |
| | Mr Renaat Verbruggen | School of Computing - Chair |
| | Ms Karen Keating | Faculty Administration |
| | Mr Paul Wogan | Faculty Technical |
| | Dr Pascal Landais | School of Electronic Engineering |
| | Dr Ronan Scaife | School of Electronic Engineering |
| | Dr Bryan MacDonald | School of Mechanical & Manufacturing Engineering |
| | Dr Paul Young | School of Mechanical & Manufacturing Engineering |
| | Dr Suzanne Little | School of Computing |
| 4 | **Faculty Management Board:** | |
| | Professor Barry McMullin | Executive Dean - Chair |
| | Dr Mark Roantree | Associate Dean for Research |
| | Dr Brian Corcoran | Associate Dean for Education |
| | Dr Joseph Stokes | Head of School, School of Mechanical & Manufacturing Engineering |
| | Professor Rory O'Connor | Head of School, School of Computing |
| | Dr Conor Brennan | Acting Head of School, School of Electronic Engineering |
| | Ms Michele Pringle | Faculty Manager |
| | Dr Derek Molloy | School of Electronic Engineering |
| | Mr John Whelan | Faculty Services Committee |
| | Dr Paul Young | School of Mechanical & Manufacturing Engineering |
| | Dr Martin Crane | School of Computing |
| | Ms Audrey Leonard | Faculty Administrative Rep |
| 5 | **Faculty Committee for Education:** | |
| | Dr Brian Corcoran | Associate Dean for Education - Chair |
| | Dr Harry Esmonde | School of Mechanical & Manufacturing Engineering |
| | Dr Tamas Szecsi | School of Mechanical & Manufacturing Engineering |
| | Dr Gareth Jones | School of Computing |
| | Dr Paul Clarke | School of Computing |
| | Dr Jennifer McManis | School of Electronic Engineering |
| | Dr Pascal Landais | School of Electronic Engineering |
| | Ms Karen Keating | Faculty Administrative Rep |
| 6 | **Faculty Committee for Research:** | |
| | Mr Mark Roantree | Associate Dean for Research - Chair |
| | Dr Marissa Condon | School of Electronic Engineering |
| | Professor  Andy Way | School of Computing |
| | Professor Dermot Brabazon | School of Mechanical & Manufacturing Engineering |
| | Dr David Monaghan | Post Doc Researcher, Insight Centre for Data Analytics |
| | Dr Cathal Gurrin | School of  Computing |

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| | Dr Martin Collier | School of Electronic Engineering |
| | Dr Garett McGuinness | School of Mechanical & Manufacturing Engineering |
| | Dr Martin Crane | School of Computing |
| | Ms Irene McEvoy | Faculty Administrative Rep |
| 7 | **Faculty Services Committee:** | |
| | Mr Liam Domican | School of Mechanical & Manufacturing - Chair |
| | Mr John Whelan | School of Electronic Engineering |
| | Mr Michael Tyrrell | School of Mechanical & Manufacturing Engineering |
| | Mr Peter McGorman | School of Computing |
| | Mr Christopher Crouch | School of Mechanical & Manufacturing Engineering |
| | Mr Liam Meaney | School of Electronic Engineering |
| | Mr Jim Doyle | School of Computing |
| | Mr Paul Wogan | School of Electronic Engineering |
| | Ms Michele Pringle | Faculty Manager |
| 8 | **Research Centre Directors:** | |
| | Professor Alan Smeaton | Director, Insight Centre for Data Analytics |
| | Professor Andy Way | Director, Adapt |
| | Professor Nicholas Dunne | Director, MEDeng Centre |
| | Professor Dermot Brabazon | Director,  APT |
| | Dr Martin Collier | Director, Entwine |
| | Professor Noel O Connor | Academic Director, Research and Enterprise Hub, Information Technology & the Digital Society |
| 9 | **Heads of Schools** | |
| | Dr Joseph Stokes | Head of School, School of Mechanical & Manufacturing |
| | Professor Rory O'Connor | Head of School, School of Computing |
| | Dr Conor Brennan | Acting Head of School. Electronic Engineering |
| 10 | **Academic Staff:** | |
| | Professor Qun Liu | School of Computing [Adapt] |
| | Professor Gareth Jones | School of Computing [Adapt] |
| | Dr Martin Crane | School of Computing [Arc-Sym] |
| | Dr Cathal Gurrin | School of Computing [Insight] |
| | Dr Monica Ward | School of Computing |
| | Dr Alex O'Connor | School of Computing |
| | Dr Marija Bezbradica | School of Computing |
| | Dr Andrew McCarren | School of Computing |
| | Professor Nicholas Dunne | School of Mechanical & Manufacturing Engineering |
| | Professor Dermot Brabazon | School of Mechanical & Manufacturing Engineering |
| | Dr Owen Clarkin | School of Mechanical & Manufacturing Engineering |
| | Dr Brian Corcoran | School of Mechanical & Manufacturing Engineering |
| | Dr Garrett McGuinness | School of Mechanical & Manufacturing Engineering |

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| | Dr Yan Delaure | School of Mechanical & Manufacturing Engineering |
| | Professor Patrick McNally | School of Electronic Engineering |
| | Dr Noel Murphy | School of Electronic Engineering |
| | Ms Jennifer Bruton | School of Electronic Engineering |
| | Dr Robert Sadleir | School of Electronic Engineering |
| | Dr Prince Anandarajah | School of Electronic Engineering |
| | Dr Conor McArdle | School of Electronic Engineering |
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| | **Post doctorate Researcher:** | School of Electronic Engineering [NCPST] |
| | Dr Rajani Vijayaraghavan | School of Electronic Engineering [INSIGHT] |
| | Dr David Monaghan | School of Mechanical & Manufacturing |
| | Dr James Carton | |
| 11 | **Administrative Staff:** | |
| | Ms Caoimhe O'Broin | Secretary, School of Mechanical & Manufacturing |
| | Ms Patricia Lacey | Secretary, School of Computing |
| | Ms Ruth Blayney | Administrator, Insight Centre for Data Analytics |
| | Mr Aidan McElwaine | Accountant, Insight Centre for Data Analytics |
| | Mr Gabriel Hogan | ADAPT |
| | Ms Sophie Mataboro | ADAPT |
| | Ms Karen Keating | Faculty office |
| | Ms Irene McEvoy | Faculty office |
| | Mrs Suzanne Rickerby | Faculty office |
| | Ms Tanya Keogh | Faculty office |
| | Ms Michele Pringle | Faculty office |
| | | |
| | **Technical Staff:** | |
| | Mr Robert Clare | School of Electronic Engineering |
| | Mr Billy Roarty | School of Electronic Engineering |
| | Mr Liam Meany | School of Electronic Engineering |
| | Mr Liam Domican | School of Mechanical & Manufacturing Engineering |
| | Mr James Barry | School of Mechanical & Manufacturing Engineering |
| | Mr Michael Tyrrell | School of Mechanical & Manufacturing Engineering |
| | Mr Jim Doyle | School of Computing |
| | Mr Peter McGorman | School of Computing |
| | Mr Eugene Curran | School of Computing |
| 12 | **UG Students:** | |
| | Mr Lorcan Boyle | CA3 & Redbrick, School of Computing |
| | Ms Cliona Kehoe | CA3, School of Computing |
| | Ms Eibhlin McGeady | CA4, School of Computing |
| | Ms Megan Walsh | EC4, School of Computing |
| | Mr Tolulope Antonio Odunuga | EC4, School of Computing |
| | Mr John Lindsay | EC4, School of Computing |

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| | Ms Anita Chiamaka Okoye | EC2, School of Computing |
| | Mr Declan Moore | EC1, School of Computing |
| | Ms Shauna Dickenson | EC2, School of Computing |
| | Ms Cliodhna Harrison | CPSSD1 & Redbrick, School of Computing |
| | Mr Sean Healy | CPSSD1 & Redbrick, School of Computing |
| | Mr David Kane | MWB4, School of Mechanical & Manufacturing Engineering |
| | Mr Niall McCabe | MWB4, School of Mechanical & Manufacturing Engineering |
| | Ms Mariane Galpo | CAM4, School of Mechanical & Manufacturing Engineering |
| | Ms Xinling Huang | CAM4, School of Mechanical & Manufacturing Engineering |
| | Ms Sruthy Kumar | BMED4, School of Mechanical & Manufacturing Engineering |
| | Mr Patrick Shortall | ECE2, School of Electronic Engineering |
| | Ms Sunayana Kantimahanthi | ECE2, School of Electronic Engineering |
| | Ms Sarah Whelan | ECE1, School of Electronic Engineering |
| | Mr Kevin McGee | ME4, School of Electronic Engineering/School of Mechanical & Manufacturing Engineering |
| | Mr Karl Somers | ICE4, School of Electronic Engineering |
| | Ms Avril Hayden | ECE3, School of Electronic Engineering |
| 13 | **PGT/PGR Students:** | |
| | Ms Laura Lingthaler | MCM, School of Computing |
| | Mr Anthony Troy | MCM, School of Computing |
| | Mr David Azcona | PhD, School of Computing [Insight] |
| | Mr Dongyun Nie | PhD, School of Computing [Insight] |
| | Mr Philip Scanlon | PhD, School of Computing [Insight] |
| | Mr Jian Zhang | PhD, School of Computing [Adapt] |
| | Ms Dasha Bogdanova | PhD, School of Computing [Adapt] |
| | Mr Peyman Pasban | PhD, School of Computing [Adapt] |
| | Mr Marlon Oliveira | PhD, School of Computing |
| | Mr Aleksas Mamkaitis | School of Computing [Lero] |
| | Mr Greg McNamara | PhD, School of Mechanical & Manufacturing Engineering |
| | Ms Cristiani Eccher | PhD, School of Mechanical & Manufacturing Engineering |
| | Mr Naif Alharbi | PhD, School of Mechanical & Manufacturing Engineering |
| | Mr Ciaran McConnell | PGT MMME, School of Mechanical & Manufacturing Engineering |
| | Ms Margaux Jousset | MTCC, School of Electronic Engineering [ECE Paris] |
| | Ms Aida Olaru | MTCC, School of Electronic Engineering |
| | Mr Mickael Illy | MTCC, School of Electronic Engineering [ECE Paris] |

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| | Mr Brendan Hayes<br>Ms Sepideh Tayeb Naimi<br>Mr Louis Free | PhD, School of Electronic Engineering<br>PhD, School of Electronic Engineering<br>PhD, School of Electronic Engineering |
| 14 | **External stakeholders (alumni & industry):**<br>Ms Tanya Levingstone<br>Dr James Carton<br>Mr Ivo Brett<br>Mr Ian Harrison<br>Mr Eugene O'Reilly<br>Mr Peter Smyth<br><br>Ms Paula Meehan<br>Mr James Reilly<br>Mr Jason Cross | <br><br>RSCI/Alumna<br>Post Doc DCU/Alumnus<br>Alumnus/EE 1992<br>GURU Project & DME 2015<br>Dromone<br>Province Five Networks & member of EE Industrial Advisory Board<br>Equiendo & EE 2010, PhD 2015<br>Facebook & DME 2013<br>Cross Agricultural Engineering & ME 2015 |
| 15 | Professor Barry McMullin | Executive Dean |
| 16 | **Senior Management Group**<br>Professor Brian MacCraith<br>Professor Eithne Guilfoyle<br>Professor Regina Connolly<br>Dr Declan Raftery<br>Professor John Costello<br>Ms Marian Burns<br>Mr Ciarán McGivern | <br>DCU President<br>Vice-President Academic Affairs (Registrar)<br>Vice-President Research and Innovation<br>Chief Operations Officer<br>Dean of Faculty of Science & Health<br>Director of Human Resources<br>Director of Finance |
| 17 | Professor Brian MacCraith | President |
| 18 | Closing Presentation | All Faculty staff invited |