



National College of Art and Design
A Recognised College of University College Dublin

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Coláiste Náisiúnta Ealaíne is Deartha
A Recognised College of University College Dublin**

**Quality Assurance Review
of
MSc in Medical Device Design
School of Design
June 2015**

Peer Review Report

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**Peer Review Group Report
of MSc in Medical Device Design
Academic Year 2015**

Members of the Peer Review Group:

1. Professor Frank Jacob, Interface Design, Muthesius Kunsthochschule, Kiel, Germany, Chair
2. Dr. Madeleine Lowery, Associate Professor, School of Electrical, Electronic and Communications Engineering, UCD
3. Sean McNulty, Managing Director, Dolmen Design

1. Timetable of the site visit

22nd June 2015

6.30 p.m.	Informal dinner – Professor Des Bell Head of Academic Affairs, Sam Russell Head of Industrial Design, Enda O’Dowd Programme Leader, Professor Frank Jacob
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23rd June 2015

8.45 a.m.	Quality Officer meets Peer Review Group at the front entrance of NCAD (archway)
9.00 – 9.30 a.m.	Review group meets with Head of Department & Programme Leader and tour facilities
9.30 – 10.00 a.m.	PRG meet with Head of School and Head of Academic Affairs
10.00 – 11.00 a.m.	PRG meet industry partner representatives
11.00 – 11.30 a.m.	Coffee break
11.30 – 12.30 p.m.	PRG meet with student and graduate representatives
12.30 – 1.00 p.m.	PRG meet with Head of Department & Programme Leader for final overview
1.00 – 2.00 p.m.	Working Lunch
2.00 – 3.30 p.m.	PRG draw up draft report identifying major requirements/recommendations
3.30 – 4.00 p.m.	Presentation of draft report to Programme Leader and Management

Please comment on suitability and adequacy of the timetable:

The timetable was well-planned and there was adequate time at each session to explore the key issues and to allow the peer review group to briefly prepare before meeting the different representatives. Additional time was found when needed through the day to answer any outstanding questions.

2. Peer Review Methodology

List areas of primary responsibility of each member of the Peer Review Group:

The members of the peer review group were very well selected to represent all areas of primary responsibilities in total; such as Industrial Design (McNulty, Jacob), Medical Design (Lowery, McNulty, Jacob), Interaction Design (Jacob), Design Business (McNulty, Jacob), Academia (Lowery, Jacob), Medical Research and Engineering (Lowery).

While Professor Jacob undertook the role of chairing each interview session the PRG decided not to assign specific areas of responsibility to individual members but instead worked as a team. During the review meetings, all group members had an opportunity to ask questions so that all areas were adequately addressed. The QA Officer was in attendance to take notes and all members of the group also took notes during meetings.

Comment on any aspects of the site visit as appropriate:

The event was fast, focused and with concise outputs.

How was the Peer Review Group Report put together?

All members of the PRG contributed to the writing of the report. The group worked together to note commendations and recommendations, which were recorded by the QA officer in draft form. Based on this draft report, an exit presentation was made to the Acting Head of School, the Head of Academic Affairs, the Head of Department and the Programme Leader. During the subsequent fortnight a second draft was circulated to the members of the PRG who finalized the report and returned it to the QA officer, who in turn forwarded it to the Head of Department and Programme Leader. The Department had an opportunity to check the report for any factual errors before submitting it to the Taught Programme Board for approval for publication on the NCAD website.

3. Introduction and Preliminary Comments of the Peer Review Group

The MSc course in Medical Device Design was introduced in 2009 in response to perceived educational and market need as outlined in the 2009 course document:

“The importance of the medical devices industry to mankind and to the Irish economy is well recognised and this new course will provide opportunities for education and research in the design of products and services for health. It is intended to create innovators for the medical device industry and, eventually, to create opportunities for research to PhD level.”

The emphasis of the programme is on human-centred design. As stated within the Programme Self-evaluation Report, the greatest opportunities for the future lie in NCAD through graduate programmes in areas such as Medical Design and Interaction Design embedded within an innovative research culture. NCAD aims to be an international centre of excellence bringing the information and communications technology industry together with the medical one in a human centred manner.

While the next section of the report (section 4) concentrates on recommendations, the work that has been achieved on this programme should not be overlooked. The PRG in particular wish to commend the following:

- Very strong industry links have been built up over the past five years.

- This is a unique programme in Europe, focusing specifically on Design for medical applications, procedures and services. It is one of only three programmes of its kind in Europe, the others running in Muthesius Kunsthochschule, Kiel, Germany and TU Delft, The Netherlands.
- The multi-disciplinary nature of the programme was highly thought of by all groups the PRG met, students, graduates and industry partners.
- There is a strong identification by students and industry partners with the programme content.
- Graduates of the programme are highly sought after and employable and this is due to the practical nature of the programme and work with industry.
- The freedom to explore, apply creative thinking and prototyping was praised by the graduates.
- Peer to peer learning opportunities are varied and enable strong process skills within graduates of the programme.
- The input from the current programme technician was highly praised by all students and graduates the PRG talked to.

The PRG support the recommendations within the self-assessment report by Industrial Design. The following recommendations are made to bolster those recommendations and to assist the Department in continuing to deliver a strong and unique programme and enable an international reputation for excellence.

4. Report of the Peer Review Group (Programme Recommendations)

4.1 Programme Management & Risk Assessment

- 4.1.1** There appears to be a lack of industry awareness of the differential this programme delivers – the programme should be promoted through case stories and through awareness within the state bodies such as Enterprise Ireland, the Local Enterprise Boards, Innovation Vouchers and the IDA.
- 4.1.2** The programme title ‘Medical Device Design’ is not descriptive of the value that graduates can deliver to the industry and a change of title could be considered. The PRG noted that projects took place within Hospitals and other centres and were not specific to medical device design. Perhaps ‘Medical Design’ as a title with a tag-line added which highlights the user experience elements and the development of better services should be emphasized more and would be more descriptive of the programme and facilitated promotion.
- 4.1.3** A shadowing process for the key programme deliverers should be established in order to provide backup to the current staffing and better risk management for the programme participants.
- 4.1.4** Everything should be clearly documented so that if need be, others can take up the running.
- 4.1.5** Consider the possibility of a longer Masters programme –18 or 24 months (90 credits with RPL or 120 credits such as UCD have) to facilitate longer projects, industry or clinical internships and deeper learning. This would also enable students to take advanced modules delivered on complementary programmes such as the new Masters in Interaction Design, or students from non-design backgrounds to take foundation level modules in core subjects.

4.2 Physical and Financial Structure of the Programme

- 4.2.1** Establish a Usability Lab as a key to supporting the learning goals and exploration process and iterative nature in creating better solutions and outcomes. It also supports the differentiation of this programme and allows NCAD to leverage and to add value for industry partners and to ensure user integration and evaluation. It will provide an environment for interaction for students on the new Interaction Masters and MDD. It is important for the Lab to be on open access to all Design students.

This would be a unique differentiator for NCAD and for their students within the island of Ireland and would enable establishment of the innovative research culture aimed for by NCAD. Part-funding could be supplied by the multi-national industry partners In the same manner that NUIG Bio-Innovate is part-funded by industry partners.

- 4.2.2** The high-precision ‘clean’ room need to be reactivated for student access as this will be the structure and environment that these students will work within. There may be a need for investment into a rapid-prototyping of soft plastics. Other

equipment which would be useful: eye-tracker, usability test software and associated technical training e.g. Morae.

4.2.3 Make certain access is provided for MDD students to equipment which may be available for Interaction Design in UCD or TCD.

4.2.4 Ensure direct access to on-line journals in the medical field for students.

4.3 Staffing & Assessment

4.3.1 An additional lecturer is urgently needed for programme sustainability and growth. The PRG recognize and commend the excellent work of the current Programme leader but at the same time note the major risk to the programme should the Leader be unavailable for any period of time. The current workload for the Programme Leader is not sustainable for any growth or development of the Programme.

4.3.2 A replacement of the current highly experienced technician is crucial. The programme cannot be delivered without a technician dedicated to the Medical Device Design programme.

4.3.3 A general comment from students and former students was that feedback to students on their project work needs to be more timely to allow students to benefit from the feedback. Additional lecturers on the programme will allow for more opportune feedback.

4.4 Teaching & Learning Strategies

4.4.1 The PRG recommend the creation of a common starting point for MDD and Interaction Design at the start of Semester 1. Both programmes could focus on fundamental knowledge such as human perception, cognition, prototyping skills, design thinking and creativity and research techniques.

4.4.2 Establishing a user interface lab would help foster a research rich environment where research would inform teaching at both UG and Masters level.

4.4.3 Learning outcomes to each project need to be explicit and conveyed to students at the start of the programme or, at the very least, at the start of the project. Each student must be able to demonstrate achievement of core components of the programme e.g. an awareness of regulations and new directives in relation to MDD. This will help to ensure that each student achieves proficiency in all core components of the programme, while still enabling students to benefit from group projects and peer learning.

4.4.4 One of the major projects could concentrate on usability and/or combine with interaction design to foster and demonstrate the uniqueness of this programme.

4.4.5 The creation of a vivid discourse around aesthetics and medical design would greatly benefit the programme and student learning, and would play to the unique strengths of the programme and NCAD.

- 4.4.6 Project work should be more clearly linked to the theory learnt at that stage of the programme – co-design the briefs with industry partners for the students.

5. Conclusions of PRG

The need for human centred design and for a holistic understanding of industrial- and interaction design has never been stronger within the medical industry and NCAD could be leading the technology-human interface development curve within Ireland. After 5 years of the programme, there is reason to celebrate its success and to create a step-change.

The PRG recommend inviting all industry partners to an event in order to discuss how they can be part of this step-change in this world-leading programme (one in three of its kind in Europe). There has been a lot more achieved in this programme than may be realised internally by NCAD.