Interview: Prof. Brian MacCraith – President, Dublin City University, Ireland

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Known as "Ireland's university of Enterprise," Dublin City University's research and educational philosophy is very much informed by the institution's strong partnerships and collaborations with the private sector. Professor Brian MacCraith discusses the institutions' unique approach to academic-private collaborations and some of the initiatives currently underway in the life science space.

Prof. MacCraith, you assumed the presidency of Dublin City University (DCU) in 2010; what was your vision for the university's development at that time, and how progress has been made along that path?

DCU is above all a young university; we took in our first students in 1980, and are proud to rank among the top 50 universities around the world that are less than 50 years old. From the very beginning, this university was founded with the intention to build strong links with industry to inform both our research and degree portfolio. When I took over as president my goal was to sharpen the focus even further and even in terms of branding, and of course build our global reputation as a research institution and collaborative partner; as such, we have taken up the tagline "DCU, Ireland's University of Enterprise."

This is a very clear and public statement that emphasizes the position DCU has taken within the spectrum of different types of universities, and highlights key aspects of DCU's character. First, it is a strong signal of our proactive engagement with the enterprise sector in all its forms. In this sense, we maintain a constant dialogue with an array of private sector partners to inform our research agenda and our degree portfolio, and the attributes we seek to develop amongst our graduates. Second, we seek to foster innovative and enterprising mindsets in our students and ultimately our graduates. Both concepts feed off each-other, and this tagline is a clear and concise statement of the nature of the university.

From a different perspective, we can say that DCU's relationship with private sector collaborators helps to kick start our innovative activity by giving us clearly articulated problem statements to which we seek to develop solutions, whether they be technology roadmap statements, product specification statements, or more fundamental knowledge gaps that need to be filled.

How does DCU's enterprise engagement and innovation strategy compare to the more traditional 'science park model'?

[Featured_in]

I looked globally at what various science parks had achieved, and I was very impressed in particular with the role Taiwanese science parks played in the country's economic development starting in the late 1970s. I looked at this notion of actually having clusters of high tech companies working closely with universities to create a rich engagement which creates an innovation ecosystem itself. I wanted to contextualize that for here.

In this sense, DCU's goal is not to gather a large number of startups and research centers in one science park, and for the university to act as a landlord and perhaps event organizer. Rather, we want the companies that come here to strongly engage with our researchers, students and infrastructure; in fact we have offered models in the past where we offer reductions in rental charges based on the number and types of engagements a given company has with the university. Proximity is of course important, but the goal is to develop an interwoven and interdependent research ecosystem between DCU and our enterprise partners.

In real terms, what are the main pieces that manage or structure DCU's many private sector engagements?

The first piece is our enterprise advisory board, which is led by key players from the range of sectors that we work with, including life sciences and ICT for instance. A vast majority of the

discussion around how we can better align our degree portfolio with the needs of the job market happens within the context of this board, along with broader aspects of our research strategy.

DCU Invent is explicitly the organization which manages our engagement with enterprise, in terms of establishing and managing all IP principles and rules, contract research agreements between the university and collaborators and the like. It is really a one stop shop for any company that wants to engage with DCU, and it is the organization that helps to make DCU the most business-friendly university in Ireland. Given these competencies and capabilities, DCU Invent also hosts our on campus incubator.

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The real hub of our enterprise engagement activity is DCU Alpha, and this is our nearby innovation campus. This facility (which previously hosted Enterprise Ireland) was transferred to DCU in 2013; the center is home to offices and laboratories for more than 40 companies that are working in different areas of advanced technologies. Most of these companies are spin-ins. We have also committed to greatly expanding DCU Alpha under our current investment plan to be able to accommodate a total of 100 companies and more than 800 workers. However, it is also worth noting that we have a number of companies that have set up facilities on our main academic campus on their own, and are very much engaged with the university, while not actually making use of the innovation center itself.

DCU is also home to DCU Ryan Academy for Entrepreneurship, which focuses on catalyzing entrepreneurship in the broader environment beyond just our university, and is funded from an endowment from the Ryan family of RyanAir. This Academy was founded with the purpose of looking at different models for accelerators and approaches towards business innovation, and then taking the observed best practices and applying them to the Irish system. After several years operating with a more outward facing orientation, the Ryan Academy has now turned its attention more towards our university ecosystem and has recently established Ireland’s first student startup accelerator program, using a best-practice model similar to that used by Techstars in the United States.

And which ones are in pharma?

Our research and innovation strategy has four pillars; biomedical technology and aging, digital society, sustainable society, and democratic and secure society. Within these areas we focus on

opportunities to develop large scale research centers, as we believe that it takes a critical mass to generate impactful results. In this sense, the vast majority of our research centers are industry-academic partnerships; in the ICT space for example we host the Insight Center for Data Analytics, the Irish Center for Cloud Computing and Commerce (IC4), and the ADAPT research center for digital content.

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For life sciences, our activities are more diffuse. The National Institute for Cellular Biotechnology is a very capable research center with several significant industry partnerships, but one of our other research centers, the Biomedical Diagnostics Institute (BDI) is going through an interesting transition.

This is because DCU is in advanced discussions to establish a Fraunhofer Center for Manufacturing Innovation here in Ireland; we have a high degree of confidence that our bid will be successful, and for now the working title is the Center for Embedded Bioanalytical Solutions. Officials from Faunhofer institute in Germany and Science Foundation Ireland have indicated a high degree of support for this project, which would focus on developing diagnostic platforms based on micro fabricated chips and immobilized bio-recognition elements, with optical or electrochemical elements to create a signal. For projects of this type the challenge is getting ideas through the design and proof of principle phase, and the Fraunhofer institute has proven to be an excellent model for such projects. If we consider projects related to disposable systems in biopharma, the center would be able to offer excellent support on the design phase, and then validation could be carried out at NIBRT here in Ireland, for example

As such the BDI is looking at how to reshape its future to build on the capabilities that this Fraunhofer institute would bring to our ecosystem, while also looking at other application contexts.

In a similar vein, we are about to host the formal opening of our latest development, a Nano-bio Analytical Research Facility. The facility is linked into NICB and focuses on the design, synthesis, scale up and characterization of nanomaterials for targeted drug delivery, bioimaging, and in-vitro and in-vivo diagnostics. When you consider the potential for this facility to operate alongside the BDI, the NICB, and the proposed Fraunhofer lined CEBAS, you can see the outline of the space that we are trying to position DCU within.

Considering the robust innovation environment around DCU, what projects or start-ups would you highlight as “high fliers” to come out of DCU?

A US based biotech called Vaccinogen, seeking to develop immunotherapeutics for cancer, identified some IP which had come out of the BDI. In 2015 they came over to examine this IP more closely, which dealt with using microfluidic technology to screen drug candidate more efficiently, and ended up deciding to acquire it from the university. But they didn't stop there; they also acquired the team that developed it and set up an R&D center here on campus to work on it more.

Kentucky-based Alltech, which was actually founded by an Irishman, has a R&D center just a short distance from our campus and is a very close collaborator with the NICB. Another example in the biomedical diagnostics space is Randox, which was developed out of Northern Ireland and is quite significant in the point of care diagnostics space world-wide.

Considering DCU's relationship with Randox, we had identified a key problem, which centers around colorectal cancer, which is the second biggest cancer killer in Ireland. Unlike in North America, colonoscopies are seen as too expensive to be used for routine screening procedure, so somewhat imprecise fecal-blood drop screening tests are used instead. As such, the BDI ran a project to design chip-based blood test using blood born markers, which took some time as it involved the discovery of these markers, but now the findings have been passed onto Randox for commercialization.

When working with academic institutions many companies have significant concerns about their IP being properly protected. How does DCU handle IP at a high level to ensure that your partners can rely upon their IP being protected?

This is one area where university policy has very much been influenced by my background as the founding director of the BDI, which was a deep academic-industry collaborative project. We worked with many partners including Becton Dickenson, RTP in North Carolina, Research Triangle Park, and Johnson and Johnson's research teams in New Jersey. Simply put, they would not have worked with us unless we put in place robust IP protocols.

I specifically remember the vice president for research at Becton Dickenson visiting us, and having our head of IP give him a presentation; his response was along the lines of "wow, I wish all universities behaved like this". From our side, we knew we wouldn't be able to work with or continue working with partners of that caliber unless we put in the necessary IP protection protocols. It all comes down to the quality of the researchers recording and note taking, the notebooks, respecting IP principles, filing of invention disclosures, processing of patents, respecting relationships with companies, respecting timelines.

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From my experience within the BDI, I have driven a strong effort to help translate the professional infrastructure which we created into the broader university. We have also taken a further step based on a common criticism we hear from our partners, which is that universities generally overestimate the value of IP before it is even validated. As such, we have implemented a process called DCU IP License Express such that companies can get access to our IP and work on its validation before we get into any detailed discussions about the value itself. This way we avoid weeks of discussions regarding the potential value ideas that may turn out to be unfeasible.

If we look forward a few years, we understand there is a rather substantial 230m euro investment happening; what are the key features investment plan and how will it strengthen DCU’s position as a top educator of skilled and employable graduates, and as a collaborator of choice for the life sciences industry?

There are a number of elements to this infrastructure investment, the first being simply capacity; we are Ireland’s fastest growing university, and we are in the fastest growing region of Ireland. At the same time, DCU can be considered a very attractive university within an international context, which can be seen by the 110 to 120 nationalities represented on campus at any given time. Both of these factors are strongly driving our student enrolment figures, and as such we simply need space to expand into.

The second aspect is in terms of our research laboratories. We have new research institutes such as the Nano-bio Analytical Research Facility, which will require significant investment to startup, and we must continue to ensure that our research facilities are up to spec and meet the needs of our enterprise partners.

Really these investments are about growth and ambition, manifesting it and believing in the future. DCU and our supporters believe that making these investments will not only be financially sustainable, in the sense that we will be able to repay the loans, but also help bring prosperity to Ireland.

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