

## 29<sup>th</sup> Annual MacGill Summer School

### *THE IRISH ECONOMY - WHAT WENT WRONG? HOW WILL WE FIX IT?*

23 July 2009

Session: The role of Irish Education in rebuilding the Economy

#### **Speech by Dr John Hegarty, Provost, Trinity College Dublin**

Thank you for the invitation to speak at the 29<sup>th</sup> Annual MacGill Summer School. The topic this year is, as usual, very timely.

I am sure that the reasons for economic collapse have been analysed in detail over the last few days and perhaps you have already reached consensus on the way forward.

As the Head of a University- whose mission it is to prepare for the future - I would say that recovery, when it happens, will be to a different Ireland. It will be an Ireland in which all organisations of the state, including Education, will have transformed themselves willingly or by necessity. In the process, we will have to think the unthinkable, imagine what was not imagined before, and try the untried. If we are smart we will build on the good things that have developed this country over the last 20 years while abandoning those that have brought collapse.

As many of the stalwart policies and visible edifices of the Celtic Tiger have disintegrated, Education stands out as one pillar whose importance is greater now than ever before and for which people rightly have great expectations. I believe that our Education sector must step up to the plate in new ways and lead the way to a stronger, more creative, Ireland in many respects. Today, I will talk of Higher Education and the role of the University in particular.

#### **Challenges for the University**

There are two challenges for the University.

The first is no different to that facing every public institution in this country: **Survival with less public resources while keeping intact the achievements of the last decade**. In this regard, we are already urgently seeking new streams of income from elsewhere – non-EU students, philanthropy, alumni, and

any other source that we can identify. All institutions are already busy maximising productivity and scrutinising internal operations for efficiencies. They are examining carefully the recommendations of An Bord Snip and are anxiously awaiting wise decisions by government.

The second challenge is the more important: **How the University can help rebuild the economy and society more generally by innovative and accelerated actions, building on the strengths already in place and taking inspiration from well-established core values.**

### **Achievements of Higher Education to date**

I am very confident that the universities will deliver based on what they and the other third level institutions have already achieved: almost 60% participation in Higher Education today compared to an entry rate of 20% (of 17-18 year olds) in 1980<sup>1</sup>; delivering special skills for industry and health since the 1980s; building research capacity of international standing with a view to creating and commercialising new knowledge. Finally, I would mention the development of strong accountability procedures and management of resources.

### **Need for innovation reflects traditional values of the University**

In stating that the University and all other institutions must be innovative and imaginative in responding to the national need, I would say that this is in line with one of the age old values of the University: the inculcation of critical thinking by challenging accepted notions - in other words, thinking what was unthinkable before, imagining the unimagined, and taking risk in the process.

In the next few minutes I would like to give a few examples of what I see as true innovation and use them as indicators for how we might plan and accelerate innovation across the whole system. All my examples are Trinity related but every university in Ireland could recite their own.

I will be arguing that the mission of the university in the Ireland of the 21<sup>st</sup> century must be three-fold: **Teaching, Research and Knowledge Transfer**, including commercialisation and employment creation. Everyone accepts the first; most countries place high value on the second - even if doubt has been expressed by An Bord Snip; and the third is least appreciated by the general public. I will also be arguing that the **University is a community**, not a business *of employees and customers*, in which everyone, students and staff alike, are always exploring, learning and challenging, and in which there is the freedom conducive to spontaneous and unconventional thinking.

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<sup>1</sup> *National Plan for Equity of Access to Higher Education 2008-13*, HEA 2008, p. 25.

## **1: Institutions joining forces – the TCD/UCD Innovation Alliance**

The first example relates to an announcement last March by Trinity and UCD in response to the Government's Smart Economy policy. We took the unprecedented and radical step of joining forces to accelerate the creation of innovative new businesses and jobs over a 10- year period.

We did this conscious that some of our predecessors might be turning over in their graves, but also conscious that a new approach to the creation of high quality jobs from excellent research and by skilled graduates was exactly what the country needed. We were also mindful that together our universities account for about 50% of research investment in Higher Education, of research students, patents and new companies. Furthermore, there was an onus on us to demonstrate that investment of public resources in knowledge and skills would be matched by accelerated translation of that knowledge and those skills back into wealth and wisdom. From an international perspective, we felt that only by combining our resources could we hope to achieve the scale and quality in both research and teaching that would allow us and the country to compete with other countries who are also seeking new ways forward.

The essence of our joint action is a transformation of the Masters and PhD programme into one that better prepares students for a career outside of academia. While we expect these students to be at the cutting edge of knowledge, we also want them to have acquired skills in entrepreneurship and innovation that will enable them to be creators of jobs and innovative practices in enterprise - rather than being job seekers and passive employees.

Teaching entrepreneurship and business awareness is not a simple task. We envisage a programme of mentoring by experts from industry and the venture capital and policy-making communities, in which students are taken out of their normal environment, working together in teams across disciplines and across the two institutions on special projects. I believe that the students will relish the experience and will gain tremendously from it in terms of maturity, confidence and creative collaboration.

On graduation, these students will constitute a new engine for innovation and enterprise not witnessed in this country before. With this programme in place, we believe that increasing the number of PhD students in our two universities is fully justified and much - needed in terms of return to the economy.

Think of the power of 1,000 Masters and PhD graduates every year from our two institutions imbued with a new and strong sense of entrepreneurship. Think of the added drive of 100,000 graduates over 10 years, both undergraduate and postgraduate, with a heightened sense of their own power and skills.

We are also taking an entirely new approach to how we manage intellectual property arising from research so that it yields a much higher level of licensing, company formation, new processes and products in existing indigenous companies, and a more effective anchoring of international companies in Ireland against intense competition. The output from research in terms of patents, spin-offs and licences is comparable to that of MIT if you relate it to investment. It is no accident that 40% of IDA - induced foreign investment in Ireland last year was R&D based, rather than coming from traditional manufacturing and services. I can foresee this increasing in the future. Our model of partnership has a number of key assumptions – that we *have* the best academic staff and research facilities. That implies investment.

The model spelled out here is at odds with the world view advocated by an Bord Snip which views universities as they were 20 years ago, largely undergraduate in nature. But it is a model consistent with government policy – the Smart Economy framework, the OECD and the EU, and furthermore with US President Obama’s view of the role of American universities which featured strongly in his stimulus package.

In our Alliance, we have stepped outside the box, we are taking a risk, but why not? Is there an alternative to new knowledge and skills on the table for future development? I think not. Reversal of investment in research and higher graduate education will, in my view, effectively suggest that ‘Ireland is closed for business’.

## **2: Inspiring teaching – one student’s experience**

The second example that I want to describe concerns the very essence of innovation in the curriculum. Two weeks ago, Trinity awarded an Honorary Degree to Janet Browne, Professor at Harvard and a graduate of Zoology at Trinity. She is the foremost biographer of Darwin. I asked her how she moved from Science to History of Science. She put it down to 6 lectures given in her fourth year at Trinity by David Webb, professor of Botany now deceased, on the history of science and its role in the development of civilisation and culture. She said that up to that point she had no idea that science had a history. What a life-transforming experience for her!

Why did Professor Webb decide to include these lectures even though they were not really formally on the curriculum? He did it because he was intensely interested in all fields and felt that students should be likewise. It was spontaneous, yet likely the result of months of private and unfettered scholarship on his part. Today such spontaneity would be frowned upon because of compliance, increased bureaucratic reporting and the need to follow a preset curriculum. These taken too far are enemies of creativity and the

magic of the unexpected. I would say, universities must be held to high standards of accountability but *please simplify compliance and regulation before it chokes us all with expense and procedures.*

### **3: Breakthroughs from unexpected quarters – a case in the Humanities**

The next example of innovation is in the Humanities. In Trinity, we are embarked on a very special ground-breaking project to unleash the power of the 18th century Long Room Library with all its hidden treasures, by the use of technology and digitisation. The Book of Kells is but the tip of the iceberg. Our plan is to define Trinity and its partner universities, and Ireland, as an international hub of scholarship in advancing the understanding of the human condition, drawing on these unique capabilities. One specific project is extremely interesting. In 1641, the outbreak of a rebellion by the Catholic Irish is alleged to have begun with a general massacre of Protestant settlers. This allegation has been the cause of much bitter historical controversy ever since. The 1641 Depositions are the witness testimonies of the Protestant settlers (men and women of all classes) gathered by Government - appointed commissioners after the Rising. All 19,000 pages have been in the Trinity Library since 1741. Our goal, with funding from the IRCHSS, is to digitise these unique testimonies and make them available to scholars all over the world for analysis. IBM is intensely involved with the project.

You might ask why IBM would be interested in such an event in the distant past? The reason is that the documents are difficult - being handwritten, with little grammatical structure, and in which the same word is often spelt differently on the same page. The most advanced digitising technology is not able to interpret such complex information – only the human brain can. IBM would like to understand the mental process involved and simulate it with entirely new innovative technology.

Here is a situation that you might not predict – the Humanities and human curiosity having the ability to transform technology. My point is that breakthroughs can come from the most unlikely quarters. The Humanities meeting the technologies can spark the most extraordinary developments and the University is an ideal meeting place for both.

### **4: Commercialisation is a partner of good research and teaching – the case of Opsona**

The next example is in the Sciences and demonstrates how Science, Art, Intellectual Property, New Business and Student Inspiration can all work together. In 2004, a new company, Opsona Therapeutics, was launched by 3 immunologists from our Schools of Biochemistry and Immunology and Medicine. Their 6-year research on the immune system produced a family of potential anti-inflammatory drugs

dealing with diseases such as rheumatoid arthritis, MS and irritable bowel disease. The founders have published their results in the best scientific journals, patented their ideas, and raised over €30m venture capital funding for their company. Through their research agreement with Wyeth and Merck - Schering Plough, they are chasing a \$450 bn market and are targeting a further \$300m investment next. Opsona is the biggest company spinning out of a university in Ireland in the Lifesciences and it could well be the next big biotechnology company in the world. Of course through our new Alliance with UCD we want to accelerate the formation of many other such companies.

There are a few interesting features about the new venture that are worth noting. First is that the company is a product of the highest quality research by world class academics funded by SFI. The research targeted the most fundamental of issues – understanding disease and the immune system. Secondly, they are training the next generation of researchers who will set up their own companies or be hired by companies like Opsona. Thirdly, the researchers are some of our best and most inspiring teachers – just ask the undergraduate students. Fourthly, they are engaged in helping the public, and especially 15 -25 year olds, to understand their science. They did this by an exhibition in the Science Gallery at Trinity on infection and the spread of disease, aimed at 2<sup>nd</sup> Level students and young people. It drew over 40,000 visitors in three months.

Here is a case which combines everything seamlessly – brilliant academics, reaching out to the second level and the public, inspiring our undergraduates, making breakthrough discovery in research, creating a new business, and training the people who will do likewise. Here there is no tension between teaching and research, between academia and business, science and the public, or between the 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> Levels. My job is to clear the way for talented individuals like these.

The point that I am making is that knowledge transfer, often narrowly defined as Innovation, is the 3<sup>rd</sup> arm of the university – it arises *naturally* from good teaching and research. The three reinforce each other. We must judge them by their outcomes and not by bureaucratic procedures. We must benchmark them against the best internationally and not tolerate second rate activity. The final point is that success does not happen overnight. It took at least 6 years of research for Opsona to happen but the impact on teaching was *immediate*.

If we persist and adopt new approaches as in our Alliance, I believe that we will see an acceleration of such new ventures with far reaching consequences in education, enterprise and meeting human needs. Again, if we switch off the investment, we switch off a complex and powerful engine for renewal and growth. We do so at our peril.

## 5: Access/NIID

The final example of innovation relates to access to education. Every 3<sup>rd</sup> Level institution has its own programme to reach out to those who are disadvantaged in our society and who have not been well represented before. Trinity's Access Programme (TAP) is about 15 years old and a great success. But we must be aware that the best way to address disadvantage is at the earliest age, at pre-school and primary level. We must be conscious also that already in this recession, there are thousands of people losing their jobs who will need access to upskilling and reskilling courses. Higher education will need to respond to this new demand in addition to all of the other demands. They are ready to do so. I would like to focus, however, on a special area of disadvantage.

A decade ago, a number of enthusiasts in Trinity along with some involved parents set up a pilot scheme for those who suffer intellectual disadvantage such as Down Syndrome. The goal was to develop within the university a programme of education that might transform the lives of these special people and to develop, through research, best practice in this area. Today we have a National Institute for Intellectual Disability (NIID), funded by the HEA and privately. The impact has been extraordinary. First, I would quote a poem by Helen Donnelly, an NIID student with Down Syndrome, which best sums up the experience:

As one door closes after me  
I open a door to the future  
Full of challenges and experiences  
Bravery, determination.

The next door I open  
Is a bumpy road ahead  
And it becomes steeper  
And harder to walk.

Until I reach the top  
Then I come down followed  
By a smooth path along the way.

Helen could well be talking of the difficulties and challenges facing this country and I hope that we will make it like she did.

The point that I want to make here is the need to question assumptions about the capacity of human beings, and to broaden the concept of who benefits from education. It is innovation in action.

## University as a community

Taking all of the examples together, there is one further general feature of the University that needs reconfirmation: the University as community.

The University is often viewed as a knowledge factory with students receiving knowledge and staff dispensing it. There is much concern at regulating and standardising the curriculum, ensuring comparability across institutions of courses and subjects, and putting in place processes for quality assurance. A lot of this is of value but there is a tendency to forget that universities are *living communities* which distinguish them from businesses. As in the monasteries which preceded them, community life involves time for reflection as well as action, in which everyone learns by being challenged inside and outside the lecture theatre, in which the qualities of wisdom, leadership, and civic engagement are honed, in which knowledge is advanced and made to work for the benefit of society, in which teaching, research and innovation are partners, in which there is engagement with enterprise, the public and government, in which the only benchmark is quality, and finally in which there is an expectation of delivery of something special and unique to society that is beyond the ordinary.

I would say that the basis for innovation and new thinking is already in place in Ireland's Higher Education Institutions. We need to *accelerate* the qualities and outputs that I have been talking about while drawing inspiration from traditional values, and we need to justify our claim to freedom by taking risk and showing impact. There is now an opportunity to do so and I am confident that Higher Education will not be found wanting. While we are busy cutting everything in the short term, we need to be careful that we do not stunt the factors that will drive recovery and sustainability in the medium to long term, in the face of intense global competition.

Finally let us remember the words of John Holdren, President Obama's Science Adviser, in his testimony to a Congressional Committee in February:

'Between 50 and 85% of the growth of the US economy over the past half-century – and two thirds of our productivity gains in recent decades - are directly attributable to scientific and technological advances'.