

## **Kaust Symposium**

### **The Role of the Research University in the 21st Century**

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Your excellencies, chairman, fellow speakers, and distinguished guests. It is my great pleasure to be here in Jeddah on the occasion of this great milestone in the foundation of the King Abdullah University of Science and Technology.

In commenting on the role of the research university in the 21st century, I thought it would be useful to share with you the experience of Ireland, a small country of 5 million people, a country which over the last decade has invested heavily in research from a very low base. There are interesting parallels between this development and what is envisaged for KAUST. I will refer to my own university, Trinity College Dublin, for examples of how the role of the university has changed and adapted.

Many of you will have heard of the dramatic economic and social transformation of Ireland. Over the last 50 years, the economy has changed from being heavily dependent on agriculture to becoming intensely knowledge-based, and Irish society, once quite insular, is now very open and confident. Over the last 15 years, a pattern of emigration stretching back over 200 years has been replaced by net immigration; instead of high unemployment, as high as 18% in the 1980s, there is now a shortage of skills. For Ireland, the arrival of the 'Celtic Tiger' signaled the prime importance of knowledge for economic, social and cultural development and for sustainability.

Ireland's economic success has been the result of many factors. However, it is generally recognised that investment in education over many generations, and the central role of the universities, has been most pivotal. In a short period, universities have had to change from being mainly undergraduate to being research intensive, and to redefine their mission quite radically. It is widely accepted by all of Ireland's universities that our mission involves making education and knowledge work for a healthy, wealthy and wise society, helping a newly successful Ireland be an effective global citizen, and ensuring that present society is fully aware of its history and understands other cultures.

In meeting this new challenge, there are a number of factors that have helped Irish universities transform in a very short time. All are based on the principle that, in a research-intensive university, teaching and learning are intimately and inexorably linked with research and scholarship and that excellence in research is the starting point from which flows innovative teaching, creative and flexible graduates, and the knowledge which will fuel new technology and social development. In particular, it is research excellence that enables the university to attract and retain the best academic staff in the world who, in turn, are creative scholars and inspiring teachers.

First is the importance of the university as a living community. The university should be more than just a campus where students acquire information and knowledge. It should be a community of experience where students are encouraged to create their own environment for civic engagement, experimenting with life and learning and developing values. Social development outside of the classroom and outside of research labs is fundamental to acquiring a breadth of outlook. It is self-organizing in many respects by the students themselves. In Trinity, we have a tremendous spirit of volunteerism among our students. They know they are privileged, they know they are living in a time when they are experiencing great advantage, and they also realize that they need to give back something because of that.

Second is the recognition that universities must deliver research to world class standards. In a country where all universities are relatively small, this has involved prioritization and the build-up of strengths in selected areas, and a focus on interdisciplinarity within a broad base of disciplines.

Third is the concept of partnership to achieve research excellence, between universities nationally and internationally, with business and industry, and with government. In this way, critical mass has been possible in key areas of the sciences and the humanities, a channel for the deployment of knowledge to the market place is built-in, student experience is broadened, and government has felt comfortable investing unprecedented resources in research.

Finally, the transformation of Irish universities to being research intensive in a short time has been enabled by philanthropy, and in particular by a son of Irish emigrants to the US. Chuck Feeney, and his philanthropic foundation, Atlantic Philanthropies, took the initiative some years ago to help develop a world-class

research infrastructure in Irish universities. His action was a catalyst which resulted in the Irish government matching his contribution.

I strongly believe that it is the combination of these factors that is underpinning the strong role of universities in Ireland's development. We are now applying the model to all of our major initiatives across the sciences and humanities. I will give one example from my own university which demonstrates how this combination works in practice.

Recently, Trinity College opened a new state of the art science facility, the Naughton Institute, which houses two compelling initiatives. One is Ireland's first purpose built nanoscience research institute, the Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN), and the other is the world's first Science Gallery. The development towards this Institute is worth noting. Beginning in 1999, the government and Atlantic Philanthropies made a joint investment in Physics and Chemistry for a programme in nanoscience. In 2003 the government, through Science Foundation Ireland, made a major investment in academic leaders in the area and in a programme involving Intel, HP, and other Irish universities. In 2007, a philanthropic contribution along with further government and private investment resulted in the building of the Naughton Institute, housing 130 researchers of over thirty nationalities, and at a total cost of 100m euro to date for people and capital. As a result, Ireland has recently been ranked 6<sup>th</sup> in the world in nanoscience in terms of citations per published scientific paper. Two spin-off companies have already been created. The Institute's other flagship national initiative, the Science Gallery, is a new outreach concept to bring the public and the scientists together through exhibitions and debates to address issues of major public scientific concern. The Naughton Institute is a result of complex partnerships and is now a model for all of Trinity College's future major developments.

I believe that the model of interdisciplinarity, collaboration with other universities nationally and internationally, partnership with industry and with philanthropists, and outreach to engage the public, is the model most suitable for a small country with limited natural resources. It may well be a model that KAUST might want to consider as it develops.

In closing I would like to highlight one other factor that I believe is important to all great universities, a balance between the humanities and the sciences across a wide sweep of disciplines and across the breadth of human knowledge and experience. Students learn best in this broad environment even if they specialise.

KAUST, as one of the world's most far sighted initiatives, is being established to specialize in graduate level science and technology with major global outreach. It also has a great opportunity to embrace certain aspects of the humanities, especially in the use of technology to access the great heritage and traditions of the Islamic world and in promoting understanding across cultures.

I would like to take this opportunity to congratulate King Abdullah on this innovative and visionary initiative which holds so much promise for the discoveries of the future and for the people of the Kingdom of Saudi Arabia and the wider world.