

Strategic choices in internationalization of
Delft University of Technology

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It is a real pleasure to be invited here today. This year's conference in Milan is proving a great success and I am delighted to be following my distinguished colleagues from Eindhoven, Dublin, Karlsruhe, and Valencia on this important panel.

My remarks today will focus on the strategic choices in internationalization Delft University of Technology has made. This is reflected in the international partnerships and alliances that Delft has forged in recent years and in our progress in the rapidly developing arena of on line education. It is an extremely exciting time, and I have had the honor of helping navigate Delft through a fast-moving landscape where my experience as a former Ambassador, both in China and the UN in New York, has often proved more useful in the context of research and higher education than I ever anticipated!

University strategy needs to be moulded around world economic developments

Indeed, the key starting point for Delft's strategy for international partnerships and alliances is very much around aligning the university with recent changes in the international environment. Here, the rise of the BRICS (Brazil, Russia, India, China and South Africa) is perhaps the defining change of the post-Cold War world. The growing potential of these emerging markets is well documented, and they are also having a 'game-changing' impact for universities and higher education in at least two respects.

Firstly, there has been a shift in the global research and knowledge landscape away from the developed world. Take the pioneering work of the Thomson Reuters Web of Knowledge Research Project, for instance. In 1973, about two thirds of the nearly 400,000 academic research publications indexed by Thomson Reuters came from the G7 countries. Today, four times as many documents (around 1.75 million journal publications) are being indexed, and half originate from outside the G7. This is transformational and, inevitably, has massive implications for universities right across the developed world, including Delft.

The second key trend is that the changing global research and knowledge landscape is fueling internationalization of higher education with a global elite of institutions emerging. That is, at least 3-4 poles of world academic excellence -- of different quantity and quality -- are now present in Asia (most especially China, but other countries like India and Vietnam too), North America, Europe and also other countries like Brazil, Russia and, to some degree, South Africa too.

Within these poles, there are already about 20 truly best-in-class universities, which will probably grow in number to about 50 by 2020. One of the key differentiators is that these institutions are essentially giant global magnets attracting the very best students and academics from across the world. Their success (including their funding bases) increasingly depends on international integration, rather than national networks. And, this points to the increasing reality that the role of national higher education policy is becoming increasingly eroded.

Whilst funding in most European universities is being eroded or stagnates at best, some Asian countries are investing amounts unimaginable to us in higher education and research facilities. Their scientific quality generally stills falls short of ours, but their facilities are well ahead. For leading researchers in many fields, the BRICS are therefore increasing the place to be.

[Delft's strategy in international partnerships](#)

It is in this context that Delft has centered its approach to international partnerships and alliances. We believe the choice we face is one of continual adaptation to this international environment, or gradual decay. If Delft, and indeed other European universities, want to continue undertaking research at the highest level, we have to give more of our scientists the opportunity to work where the best campuses increasingly are (the BRICS) -- whilst, of course, ensuring their 'know-how' continues to benefit our home nations.

In a context where higher education and research are more international, Delft is in effect planting pieces of the university in the places where they have the best chance of flourishing and where the greatest yields in knowledge are to be had. And that is right now in the BRICS.

Rather than focusing on ad hoc, or informal cooperation, we believe that the best way forward for Delft is securing robust institutional frameworks with other top universities or institutions. In China, for instance, we have opened four research centres in only the last couple of years. In partnership with the Chinese Academy of Science, a Beijing Research Centre is engaged mainly in research on Solid State Lighting; with Hohai University in Nanjing, a Water Research Centre is focused upon Delta technology and hydrology. Meanwhile with Wuhan University we have launched a Centre for Geo-Information, Geodesy and Earth Observation; and with South China University of Technology in Guangzhou we have started the Research Centre for Urban Systems and Environment.

In each of these four research fields (solid state lighting, water, geo-information, and urban systems) the Netherlands is a world knowledge leader. And China's rapid growth means it is facing need for major new innovation and expertise in these areas. The advantages are on both sides, comprising of access to talent pools, access to state of the art research infrastructure, access to research funding and access to well vested traditions of research rigor.

To be sure, China is not the only country in which we are developing such strategic partnerships. In India, for instance, Delft University recently signed a Memorandum of Understanding with IISC Bangalore on research collaboration, laying the groundwork for a similar joint research center. Meanwhile, outside Asia in Brazil, we have opened a research centre in Campinas which focuses on renewable bio-materials and biofuels (bio-renewables) in the broadest sense, including a series of related clean and sustainable technologies.

'Clicks' vs. 'bricks'.

My prediction is that as research in science and technology increasingly moves beyond national borders, it is very likely we will see major research hubs developing, consisting of universities and their direct eco-system and connected through a global network of research activity. A lot of focus is being placed on ICT technologies as a carrier of international research cooperation. However there will be 'no clicks without bricks' and the major research hubs will develop where research infrastructure and vibrant eco-systems are best.

Our view, quite simply, is that the very best researchers will increasingly gravitate to the emerging focal points of their disciplines. We have to make sure that these focal points will not just be in Asia or the United States alone. Europe needs to defend its rich and productive academic legacy and make sure that it plays a full role in leading edge research through strong hubs in a global network of research cooperation.

'Clicks and bricks' and Delft's international MOOC alliance

I mentioned earlier that there will be 'no clicks without bricks' and the major research hubs will develop where research infrastructure and vibrant eco-systems are best. While this is certainly true, Delft does not underestimate the potential opportunity that comes from IT, on-line education and distance learning. We think on-line education can add massive value for people right across the world, especially in developing countries where resources are most constrained.

As the global pool of education and knowledge continually expands, and demand for access to it increases, traditional means of sharing and disseminating it are under unprecedented strain. UNESCO, for instance, estimates that by 2025, there will be at least 80 million more people than now seeking higher education. This would require construction, each and every week for the next 12 years of six universities or higher education college of the size of Delft capable of accommodating 18,000 students, much of them in the developing world. That's simply not going to happen.

Much of the answer lies in realizing the full potential of the internet, including through so-called Massive Open On-line Courses (MOOCs). To this end, Delft was delighted to accept earlier this year an invitation to join the edX non-profit MOOC consortium. edX was started by Harvard and MIT, and now includes 29 universities, for example Rice University, the Australian National University, McGill University, École Polytechnique Fédérale de Lausanne and the latest addition, GeorgiaTech. One of the reasons why Delft has chosen edX is that the materials can be published there under an open license, making them available for others to use.

The first two MOOCs offered by Delft are on Solar Energy and Introduction to Water Treatment. These provide free online access to the knowledge of Delft to everyone, anywhere in the world. MOOCs are offered during a fixed period of ten weeks and with opportunities to interact with fellow students. Participants will receive homework assignments, and they can conclude the course with a certificate of participation. And all the materials (which include video recordings, as well as course materials and sample exams) will be placed on the edX platform. 75.000 participants have registered for the two courses; this is a massive number.

Research and education infrastructure key prerequisite.

Delft's alliances and partnerships are just one of two key strands to help us become more internationalized and, indeed, ultimately one of the key universities of the future. As well as embedding parts of Delft in the BRICs, and forging our alliances in on line education it is vital that we redouble our efforts to attract the best scientists and students to the Netherlands from right across the world. As I hope I've underscored already, education and research are increasingly characterized by international co-operation and funding, and we must embrace the rich opportunities offered by recruiting foreign academics and students.

So what more must Delft and other individual universities in Europe do to thrive in this rapidly changing landscape? Let me restrict my comments to just one topic, often neglected, even denied by policy makers. We must enhance our facilities to attract the very best researchers. Enhancing campuses (many university buildings in Europe, for instance, date back many decades) is a pre-condition for attracting and retaining our knowledge capital, for being more competitive in the global battle for brains, and for supporting innovation in the economy. 'Bricks' in its direct meaning.

Let me draw an analogy with the financial sector here. Since the financial crisis in Europe we hear of so called 'system banks'. And, apparently, the system banks are seen as vital to the system and therefore too important to fail. 'Stress tests' are being conducted to assess the sustainability of the financial system. I would argue that the university system in Europe is at least as determining for Europe's future as the banking system is. We too are too important to fail. So why not conduct a university campus stress test to assess the robustness of Europe's higher education and research infrastructure. I fear the outcomes will be rather chilling and will call for an extensive overhaul of the existing facilities.

We could increase focus on this by better sharing knowledge about campus improvement and management. Key tools to enable this include performance benchmarks such as inter-university collaboration, space utilization, ecological footprint, total costs and shared university-city functions. At Delft we are experimenting with a 'campus stress test' and we hope to receive support from the European Commission to develop this tool in order to make it available to other universities as well. In this way we can map Europe's higher education infrastructure readiness to engage global competition

Conclusions

To conclude my discussion today, it is crystal clear to me that the opportunities from internationalization are great, and Delft's growing range of institutional alliances in research and partnerships in on line education are helping us realize this massive potential. However, the quality of our facilities play a crucial role. If we can surmount the challenges on the way, the prizes will be sizable. These include better global reputation; more breakthrough research to meet societal challenges; more opportunity to share academic discoveries with those countries in the developing world. which can use them most; and also clear economic benefit for the Netherlands and Europe.

I hope you'll agree these are most worthy ambitions, and I thank-you for your time in listening to me today.

Milan, 28th of September 2013.