

Speech on the occasion of the 445th Dies Natalis of Leiden University

Delivered in a much abbreviated form in the Pieterskerk in Leiden, 7 February 2020

It is, as always, a great pleasure as Rector of this University to be able to say a few words at the end of this Dies celebration.

At present, we are facing and will continue to face turbulent times in and around the academic world.

Last year we reflected at length on Brexit and what it could mean for European education and research. Brexit is now a fact, but it is still not clear how it will work out in practice. We regard it as a matter of much regret, and we communicated this sentiment to our British partners last week.

Today, Extinction Rebellion has asked for our attention to their cause.

And last September we experienced a very unusual Opening of the Academic Year here in Leiden, not only with the Minister but also with an “alternative opening” organised by over-worked teaching staff and researchers. As yet, we do not have a happy ending.¹

Today I would like to draw your attention to three points. What are the strategic questions currently facing Dutch universities? And in particular: the importance of partners in helping us to collaborate more effectively across the borders of individual disciplines; the Leiden-Delft-Erasmus alliance is one such partnership. I therefore asked a number of our scholars how they view interdisciplinary collaboration, and what role they think will then remain for the disciplines. And finally I will come back to the topic of Africa.

1. What are the questions facing our universities?

In recent years we have seen a continuous increase in the range of issues facing universities. These issues fall into six main themes: education and research, the people who do this work, the funding of the work, technological developments, the local and global challenges, which surprisingly often run parallel to each other, and hence – inextricably linked with these – the positioning of universities.

2. The Leiden-Delft-Erasmus alliance

Positioning. It’s a word that we’ve been hearing more and more often in recent times, and it’s an issue that currently occupies all Dutch universities. Positioning is about such questions as: what are your key qualities, as a university; who do you belong to, and who are you there for; what do you want to be good at; and... who are your most important partners? These are questions that we will be discussing in more detail in the coming months, as we prepare our new University strategic plan.

LERU is one of these partnerships, of course, but the strategic alliance that we have with Delft and Erasmus – “LDE” – is at least as important.

We started LDE in 2013, and the partnership has expanded over the years, from collaboration in medicine in Medical Delta, to joint study programmes between Delft,

¹ A study has meanwhile commenced to look at our educational funding, and the Minister has now committed to demanding an extra billion euros for higher education. Last week saw the publication of the long-awaited KNAW report of the Weckhuijsen Committee, which found that the situation on the research side has also become critical.

Erasmus and Leiden in the domains of the sciences, the humanities, the social sciences and the life sciences, and to giving each other's students access to our minors and elective courses. From intensive collaboration between Leiden and Delft physicists working on the Quantum Computer to our latest LDE Centre for Governance of Migration and Diversity, in addition to the Leiden master's programme of the same name.

Positioning is about determining where you stand at different levels: in relation to the region (for example, the University of the North); in relation to other Dutch research universities and universities of applied sciences; within Europe, for example in the new European networks;² and, of course, worldwide. This is because many of the major issues facing us play out at the regional, European and global levels: challenges like climate change, energy transition, increasing urbanisation, migration and population ageing.

It is obvious that universities will look to their neighbouring institutions. My colleague in Delft, Tim van der Hagen, put it well at the Foundation Day in Delft last January:

"It is our belief that such manifold and intertwined problems can only be solved if we pool all our scientific resources, if we collaborate in entirely new ways. Collaboration that goes beyond interdisciplinary or multidisciplinary research: no longer side by side, but merging our efforts so that we approach these challenges in a more holistic way. This will lead to new research and educational programmes that are thematic rather than disciplinary in their orientation. Convergence is the word."

Tim then showed that he is a true engineer:

"We will break down walls: physical walls, but more often metaphysical walls, that have long existed between disciplines, departments and institutions. By breaking down these walls, we create room for research ecosystems that can go beyond what any single university can achieve on its own, ecosystems where we can strengthen and accelerate our research efforts."³

These are words that we might use less readily in Leiden than in Delft or in Rotterdam, a city where they like to "make things happen". The photograph of three men on a walkway⁴ made a forceful contribution to creating the image that now we will be doing something totally different. The power of the message is that it's visionary: we're going to do things differently.

One or two people did wonder: where's the Leiden Rector on the photograph? Just to make it clear: this specific initiative is primarily a strengthening of the LDE axis between Delft and Erasmus, within the overall partnership of the three universities and their medical centres – just one of the axes of the LDE alliance; nothing more, but certainly nothing less.

3. Positioning: four examples of visionary moments

It's about positioning, then, and for that you need visionary moments. Our university has had many of those visionary moments: the first was, of course, the vision of William of

² Leiden is collaborating in setting up a European University Network to promote the wellbeing of citizens, *EUniWell*, which is already inspiring a great deal of energy.

³ <https://www.leiden-delft-erasmus.nl/nl/nieuws/samenwerking-zuid-hollandse-academische-instellingen-centraal-in-dies-rede-rector-magnificus>

⁴ NRC 10 January 2020: <https://www.nrc.nl/nieuws/2020/01/10/vergaande-samenwerking-tussen-tu-delft-en-erasmus-universiteit-en-ziekenhuis-a3986456>

Orange 445 years ago: to found a university in the Northern Netherlands. And that is the vision we're celebrating today.

The Leiden Bio Science Park is without doubt another one: the idea of a visionary man, the biochemist Professor Rob Schilperoort. On this very day 35 years ago the first pile was driven, marking the start of the Leiden Bio Science Park. This Park has now developed into the second largest science park in the Netherlands and the seventh largest in Europe, in the area of the life sciences.

Yet another visionary moment resulted in what is now our Campus The Hague. The visionaries here were Mayor Wim Deetman and Loek Vredevoogd, the then President of our Executive Board, with Jouke de Vries as another driving force, overseeing its creation. Since then the Campus has grown organically, and by next year we will have around 7,000 students and 300 researchers and staff.

And a fourth example of a visionary moment is the notion that arose in 2013 of a close strategic partnership of Leiden with Delft University of Technology and Erasmus University, and their medical centres. The expansion was organic here too; the alliance began cautiously with a few joint study programmes and has now grown into a vibrant ecosystem of the three universities and their medical centres.

In each case, what you see is a vision developing on the basis of a good idea and then being taken further, in cooperation with the researchers, teaching staff and students, and with the crucial contribution of the support staff. Over the past nearly four-and-a-half centuries, Leiden University has taken shape organically, and has seen how disciplines in Leiden and around the world came into being and then evolved because individuals, groups and universities meet with one another within the disciplines, around the borders of the disciplines, and across those borders. Even developments that ultimately became very extensive – for our University, Campus The Hague and the Bio Science Park – started in a combination of vision, strategy and taking it further together. Our scholars and our students have played –and still play – a crucial role in this.

4. **“We’re going to do things differently!” What do our scholars think?**

We've seen that things need to be done differently. Yet they also need to be done in the same way. This brings me to the disciplines, some of which have an extremely long tradition. Replying to my emailed question, *Carlo Beenakker*, a physicist who works intensively in the collaboration between Leiden and Delft, in which he described those disciplines as instruments in the orchestra, all of which need one another.

“Instruments playing in harmony clearly gives added value, but only if every instrument individually is played at a high level. Before a flautist or violinist can make a valuable contribution to an orchestra, he or she must have invested ten thousand hours or more in practising his or her own instrument. It's exactly the same in science: a physicist or a chemist can only be valuable in an interdisciplinary team after devoting many years (10,000 hours is about 6-10 years of studying) to his or her own discipline. A university that neglects the disciplines is like a conservatoire that only trains musicians to be all-round members of an orchestra.”

As well as Carlo Beenakker, I had asked ten other scholars who often engage in interdisciplinary research about their experiences with interdisciplinarity – across all different parts of the University. I asked them: which aspects of collaboration do you find

difficult, which aspects do you find inspiring, how important are your own disciplines for your interdisciplinary work? These are important questions: in 2015 the Young Academy of the KNAW published an excellent exploratory report on this subject.⁵

Carlo's reply received a great deal of support from other members of my email group.

Many responses emphasised the need to cherish the bottom-up approach. And to be very careful about only aiming for impact. *Ewine van Dishoeck* quoted Arjen Doelman, the Director of the Lorentz Center, saying that you must cherish the disciplines, just like a basketball player and his "pivot foot".

I completely agree, was the response from economist *Olaf van Vliet*, and we are sometimes very cautious about entering into collaboration, and producing joint publications, for example. One of the most serious obstacles (at least for economists) is that many journals are still mainly interested in monodisciplinary articles.

Law professor *Simone van der Hof* of the Leiden Centre for eLaw wrote:

"To be able to work well in multi- or interdisciplinary networks, you certainly need to have a strong basis within your own discipline. This provides the foundations on which interdisciplinary research and teaching are built, and they need to be robust enough to bear the weight of the edifice. At the same time, you need to have an open mind, creativity and excellent communication skills – curiosity about other disciplines, the ability to make connections and to translate concepts between disciplines. We rarely encounter practical problems (although time and money are always scarce commodities, given our ambitions) but this is because the combination of law and technology has from the outset always been a multidisciplinary research area (and increasingly also interdisciplinary), and our students and PhD candidates grow up in this setting. However, career policy is an aspect that requires attention when you bring other disciplines into your own faculty, because the research and teaching (and the rewarding of them) are still usually organised along disciplinary lines. And we sometimes also come up against disciplinary boundaries in relation to research acquisition and publishing of research. Other than that, I am pleased to report that interdisciplinary research teams have already been established in Leiden, for instance relating to technological developments within cardiology and radiology, which include collaboration with law (and not only eLaw). The members of those teams are working together with great enthusiasm."

Boudewijn Lelieveldt, Professor of Biomedical Imaging at the LUMC and also a Medical Delta professor at Delft, says:

"Personally, as a technician working in a medical centre like the LUMC, I experience this dichotomy between the technical and biomedical sciences every day, and I often use the analogy of a Formula 1 team. You need a kind of 'job differentiation' into people who are very good at one specific thing, such as designing the fastest possible engine; they shouldn't be bothered with 'worldly matters' like aerodynamics and bodywork. Then you have the connectors, people who can build a good car around this engine, and they need to be able to talk with the engine developers but also with the end users, the racing drivers themselves."

⁵ The Young Academy (2015). *Grensverleggend. Kansen en belemmeringen voor interdisciplinair onderzoek* (Interdisciplinarity in practice. Opportunities and pitfalls for interdisciplinary research). Amsterdam:
<https://www.dejongeakademie.nl/shared/resources/documents/20151116adviesinterdisciplinairiteitdjaweb.pdf>

Marlou Schrover of the LDE Centre for Governance of Migration and Diversity mailed:

“Collaboration between disciplines does not mean that disciplines will disappear (or that knowledge that has been built up over the years or centuries will disappear). Collaboration is like a ‘salad bowl’ (to use a favourite but somewhat outdated migration metaphor): the quality of the whole is determined by all the parts and also by being able to identify what they are. We have seen very clearly in our master’s programme that its strength lies in precisely this combination of knowledge. Social scientists (and journalists and politicians) often have a limited understanding of history (they think that migration is something that only happened in recent decades). History students may sometimes have difficulty with the theoretical foundations, but they can offer a solid basis of extensive empirical research (which is greatly appreciated by employers). The work and publications of migration researchers are very often interdisciplinary (combining knowledge and insights from different disciplines).”

Linguist *Niels Schiller* said:

“Disciplines will continue to be important, but new disciplines are also emerging. Looking at my own area of expertise: I started out in the humanities (computational linguistics, phonetics) and then gained my PhD in the social sciences (psychology). I have worked alternately in faculties of humanities and social sciences. Now my field (psycho- and neurolinguistics) is a discipline of its own: a kind of new molecule composed of a number of atoms (linguistics, psychology, computer science – although you could question whether some of these disciplines might not actually be molecules themselves...). If you ask a linguist, there is a strong possibility that he or she will say that I am not a linguist. If you ask a psychologist, there is an equally strong possibility that he or she will say that I am not a psychologist. So disciplines are still important, but we just need to realise that new disciplines will be added and perhaps some of the old ones will disappear. The world and society are dynamic, resistance is futile.”

Thomas Hankemeier is Professor of Analytical BioSciences and Metabolomics. He wrote:

“You need to have a strong basis to work collaboratively, and this strong basis is your own discipline! My own discipline has actually become somewhat broader over the last 10-20 years: other expertises have been incorporated into ‘my’ discipline, and my own research has speeded up dramatically. I’m thinking here of the combination of technology (microfluidics) and data analysis (big data/AI) with my own expertise (analytical biosciences and measuring and studying metabolism).”

Collaboration in networks is very important. Human relationships (trust, inspiration, fun) are preconditions for this collaboration. It can sometimes be very small things that make the big difference between whether you succeed in being an innovative and global inspiration in a collaboration or network, or whether you simply follow others.... This is not something you can force. And you won’t find it only in the province of South Holland. I myself, for instance, have a strategic alliance with Imperial College London in my field. But Medical Delta offers a great many opportunities for partnerships. I enjoy them very much and in my case gain great benefits from the strategic collaboration with the Erasmus MC.

I think that synergies must mainly be bottom-up developments. BUT, there are also many barriers within institutions that specifically promote internal collaboration, using only their own (often limited) infrastructure. I see a great deal of duplication of the same things at different universities in the Netherlands. This is not the way to achieve a world-leading position in research. The heads of the universities could play a role in ensuring that infrastructures are shared more. There’s room for improvement in the Netherlands, and even in the Medical Delta as well. However, the research itself around this infrastructure has to be driven from the bottom up.”

Political scientist *Amy Verdun* points to the importance of what we call the epistemological and ontological traditions:

“In the social sciences we have a particular form of training, an operating method and a way of looking at research. Even if a given problem has cross-disciplinary characteristics, it is still important to be trained in a specific tradition. People should not, of course, spend too much time working in ‘silos’, and they can explore and collaborate across the borders of the disciplines. This is why large research projects often require multidisciplinary or interdisciplinary (a difference!) teams. And that’s good. Because the research material and types of research questions become coloured by the theories, knowledge and research methods of a particular discipline. I have indeed often worked in interdisciplinary collaborations, but that does not mean there are no advantages in thoroughly mastering a particular discipline. In the United States, for example, the training of PhD candidates constantly emphasises learning a ‘discipline’. There has to be ‘something’ that you’re good at, a ‘baseline’ from which the candidate starts out, in which he or she has been trained. PhD candidates with an ‘interdisciplinary’ education often find it difficult to obtain an academic position, because there is still uncertainty about what they can actually do (here you can also think of what Carlo Beenakker said about 10,000 hours); and see also in this connection the Canadian journalist Malcolm Gladwell, who popularised this idea in his book *Outliers*. Even taking account of the criticism of that work, you can see that practising remains central, but that talent, training and opportunity are also important factors. The rules of the game must still be important as well. Those rules were developed gradually and also give the researchers some guidance and a compass. Not everyone is good at everything. Some people, even with a great deal of practice, will never get there, because they don’t have the talent; others may not have received the right training. It is therefore a very fragile balance between those factors: practice, training, knowledge transfer and opportunity.”

And health psychologist *Andrea Evers* emphasised the need to make strategic choices:

“I think the LDE alliance is an excellent opportunity for three highly complementary universities to make each other much stronger. However, at the moment this does not happen enough, mainly because joint strategic choices have not yet been made to strengthen this collaboration on a large scale and to encourage researchers to collaborate actively in this alliance (apart from a few exceptions, of course). Medical Delta is one example of a successful collaboration. Expanding this seems to be a crucial step, in which we organise medical / health research in an interdisciplinary way across all the faculties. If we were to organise collaborations like this very effectively in the LDE alliance or elsewhere, I think this would result in a great number of exceptionally innovative scientific collaborations, which would be fairly unique and could lead to new breakthroughs. To give an example, I personally think that many ERC Consolidator / Advanced projects (in my area) are characterised by this kind of interdisciplinary collaboration around specific themes with highly distinctive, interdisciplinary and excellent research. In these projects, the traditional disciplines are still retained, but in addition to these, interdisciplinary research themes are emerging – interconnections you could say – and there will be researchers (many more than at present) who are primarily located on those interconnections. The traditional disciplines will then still exist within the University, but in addition to these, new interdisciplinary interconnections will emerge, which (if they are very successful) could in turn develop into new disciplines (such as the emergence of a new discipline like cognitive neuroscience, for example). As I briefly explained above, I would then suggest that the education within the context of LDE is brought back into line with the strategic choices and priorities in the research. This would, in my view, offer the best possible chance of creating long-term collaborations, which could then be of great benefit to all the LDE universities.”

We are going to be applying this method of working in a combined orchestra in the area of *Artificial Intelligence*. Each of the three universities lacks specific members of the combined

orchestra, who are needed for this. But Tim van der Hagen's idea of convergence is applicable here. It is exactly what happens in an orchestra.

And *Jan Bart Gewald*, the Director of the Africa Studies Centre wrote:

"Our LDE Africa minors are very successful, offering our students real cross-disciplinary insights. This is precisely because the students from the other universities are so different. Erasmus economics students think very differently, and have completely different questions, about trade with West Africa in the 18th century compared with students from Leiden; and then there are the students from Delft, who mainly ask technical questions about how an 18th-century sailing ship worked."

And that brings us back to Africa.

5. Back to Africa

This ceremony today, with our South African honorary doctor, is a symbol for our studies of Africa, across the entire spectrum of Leiden University's seven faculties and together with the many partners that we also have on that continent. We know that this continent is exceptionally important for the world and for Europe. Now that the Africa Studies Centre has been integrated into our University, we have around 120 researchers working almost full-time on Africa. Not only within the social and behavioural sciences, but also in medicine, law, and languages and cultures. In just those languages alone, we have around four to five PhD candidates each year within our linguistics institute.

But even 120 is nowhere near enough. Leiden can never do it all alone, which is why we have the growing partnership with African Studies at the University of Edinburgh. But here today, the collaboration on Africa that we have established between Leiden, Delft and Rotterdam in the last few years is at least as interesting.

We began the collaboration in the LDE Centre for Frugal Innovation in 2012.⁶ Africa is booming. Despite the gloomy picture that often exists about the continent, there are many opportunities for new technologies there. The rapidly growing population have a great need for solutions in the area of water and food supply, healthcare and energy. But how do you make your products, services and system innovations accessible to large groups of consumers with a minimal income? How do you contribute to the UN's sustainable development goals for Africa, with their emphasis on water, energy, healthcare and food?

This is currently being researched by our Centre for Frugal Innovation in Africa (CFIA), together with Dutch companies.⁷ It was a bottom-up idea of Leiden's Africa Studies Centre, Erasmus University's International Institute of Social Sciences (ISS)/entrepreneurship and Delft's Civil Engineering; it is not something the board of a university would ever have devised.⁸ There is now also a second successful minor, African Dynamics, in which students and scholars of the three universities and their medical centres collaborate.

⁶ How can Frugal Innovation contribute to Sustainable Global Development?
<https://www.cfia.nl/home>

⁷ <https://www.leiden-delft-erasmus.nl/nl/nieuws/frugal-innovation-in-afrika-verantwoordelijk-ondernemen-in-de-zorg-en-watersector>

⁸ The aim of the CFIA minor is to enable students of the LDE universities to learn about and work with the concept of frugal innovation in relation to Africa. In the first two months, students take courses and practicals at the three universities, gaining introductory and more in-depth knowledge of the phenomenon of frugal innovation from the perspectives of technology (TU Delft), entrepreneurship (EUR) and development (Leiden). They then apply the acquired

6. To conclude

In summary: interdisciplinary collaboration must be based on very strong individual disciplines. This can be seen from the experiences and successes of the past 445 years of Leiden University, and also from the experiences and successes of the researchers of today.

And we have seen how important it is to have room for visionary ideas, to have a vision of the University and its positioning, and most of all: how important it is to have confidence in our researchers, who must be able to steer their own course and find their own partners, whether regional, national or international.

In essence, as I have tried to show today, we should continue to do what we have been doing for the last 445 years.

knowledge in an internship project abroad, working with a specific frugal innovation or conducting further research on an innovation. This gives concrete expression to multidisciplinary collaboration: students gain insight into (and understanding of) each other's knowledge and expertise, and how to apply these together in such a way that the outcome is more than the sum of the three separate parts.