Congratulations on your appointment as dean of the faculty. Some time ago, you were a TU Delft student yourself, studying mathematics. In addition to that, you also studied English language and literature in Leiden. How did that come about?

Well, I started off with just studying mathematics here. I sort of liked everything at high school, so I had a hard time choosing. I like languages, but also maths, physics, chemistry, astronomy ... I could not choose. I went to many open days and thought: maybe what I like on the 'beta' side is mathematics. It is the unifying part that is elemental to the whole of maths, chemistry and physics. I thought I would start there and maybe if I were wrong I could always easily switch, because mathematics is useful.

I visited all kinds of universities, but I really liked Delft. It was called ‘technical mathematics’ and it was very much applied mathematics. They presented how you could use maths to solve problems, instead of just proving theorems. After a couple of years of studying and I was sort of missing the language part. I loved to read, but I thought it would be nice to learn a bit more about it and talk with other people about what I had read. I then found out that for nothing extra, you could give it a try. I am not sure how it is now, you might have to pay, but in that time you did not have to pay a guilder extra.

I opted for the part-time version of English language and literature at Leiden University, which meant lectures on two evenings per week. I started there in my third year of my maths, sort of half way through the year, and finished it when I was doing my PhD. It was entirely different: the culture, the population. There was only one man in the entire class, which is the other way around from Delft. Poor guy! He left, actually, after a year. But there were a lot of older women who already had a job and started studying later, so I was much younger than the average age there.

What was your student life like? Were you involved in any societies or activities?

Yes, I was a member of de Koornbeurs. I believe that still exists. It is more of a ‘jongerenvereniging’. I liked the fact that you could also be a member if you just lived in Delft and were not a student. So, it was an open society and I had quite a good time there. I was involved in some activities, like organising the Ontvangstweek and organising cultural events there, such as stand-up comedy, theatre and other things.

That is a busy schedule: Leiden, Delft, de Koornbeurs. Did you have time for anything else?

I think I still played the clarinet at that time. I stopped playing after I had children: I had no time to practice. I was there, arriving fifteen minutes late because of work, without having practiced. I could sort of catch up along the way, but I felt sorry for the orchestra. So I stopped doing that. I do salsa dancing now, which I can do at night when everyone sleeps. Nobody suffers!

After your studies in Delft, you went on to join the Boston Consulting Group (BCG).
Is there a specific reason for doing that?
After my studies I first did my PhD, also in Delft. I had several options, but I liked the Delft topic the most and I spent around at the NASA Langley Research Center for my PhD. After my PhD, I went to BCG.

I really liked doing my PhD. I liked that it was tough, that you could dive into it. But after a while, it did not seem like something for the rest of my life. You are rather on your own. It depends a bit on your group now: in my group, people are less on their own, I think. But at that time, I was quite on my own. It was my promotor, a tutor and me. It was four years on one project.

I then thought: maybe I like solving tough problems with other people, in a shorter time; a few problems a year instead of one for four years. That is why consultancy appealed to me: it is problem solving in shorter periods with teams, while going out into the world. I wanted to see something. Instead of only seeing university, have the opportunity to see companies and what they were doing. You also get very good training there.

What was the reason to come back to academia?
I really enjoyed BCG and I would do it again, because it was a great step after my PhD. It was seeing and meeting people, learning different skills and seeing different companies. But I missed a few things. I missed science: I missed thinking for a long period of time. I also missed students, I really like working with students. I thought that for the long term, this was not really my thing. For a couple of years, yes, but not my long-term career. I preferred the science career more: students, university. Then there was a position here at the faculty as an assistant professor at Aerodynamics. I saw that when I was sort of in a dip and I thought: well, let’s apply.

Would you say that you still reap the benefits from being at BCG?
Yes, I do. It’s hard to exactly pinpoint it, but you get very good training there and I think that still comes in very handy, writing and presenting for example. Also, you learn how to tackle problems and how to work in teams.

Was going back to academia a smooth transition after being outside your profession for some time?
I could have imagined working in consulting a couple of years longer, but when I left academia I had asked my promotor: “What do you think? I am planning to go out in the world, but maybe I am wrong and I want to come back.” His response was: “Well, after two years you can come back: you can catch up, read papers and start again.” He was right. You do lose a bit: if I had done a post-doc and then went on, I would have been publishing all the time, whereas now there is a small hole in the publication list. But this is compensated by the skills and the experience I got at BCG. So, overall, it was fine and I could catch up here. The topic was slightly different from my PhD: it also concerned computational fluid dynamics, but now in a broader sense, also including challenging unsteady flows. It was nice we found a position with NASA for the first six months. I joined here, taught one course and then left to join the project at NASA on the same topic for six months in Langley, Virginia. After that, I came back. It helped me getting into the topic quickly. And of course, it was aerospace engineering, which I really liked too. The mathematics side is nice, but it is like “I have a hammer, maybe somebody needs a hammer”. In my PhD, we had solved a problem for computing fluid flows which have both high and low speeds in different ranges. Normally, we had code for high speeds and code for low speeds: one wouldn’t work for the other. I made an algorithm and implemented it, so we could solve both. Then we thought: “Right, who wants to solve this?” We found that AkzoNobel at that time was producing fibres where they stretched the fibres with air and they had this problem. It is the other way around. Here at aerospace
Speaking of challenges, what do you see being your main challenges as a dean? After all, it is quite a different job.

Of course, I know the faculty quite well. I started working here in 1999 at Aerodynamics and have been, I think, the department’s chair for five or six years. For the last couple of years, I have been the chair of the department of Aerodynamics and Wind Energy and Flight Performance and Propulsion. I have spent time in the management team with the previous dean. So I have some idea, but what I want to do first is get to know the other parts of the faculty better. I want to really make a tour, meet the other department heads, the people working at the departments, as well as the support staff.

What I see for our faculty: I think our faculty is doing really well, we attract top students. We have a top educational programme on the really exciting topic of aerospace engineering. Our master was rated one of the best in the Netherlands and our students find jobs almost the quickest of the TU Delft. We do well on research and we have a lot of PhD students: almost 200 now. Our scientific output and impact is growing and also our stamp on the world. We are in EU committees now, not only part of projects, but actually influencing the agenda. But we need to constantly strive to further improve ourselves and aim for even higher quality.

If you think about entrepreneurship, we have quite some successful start-ups like ISIS and Ephinics by aerospace engineers. At some point the largest part of the Yes!Delft incubator was aerospace. The director has informed me that this is no longer the case, so that might be a goal!

**With the budgetary constraints in mind, how is the money best spent in the faculty?**

I think 99% of the cost paid from the first money stream – coming from the university – is fixed: salaries, labs. Your financial steering power is, therefore, quite limited. And I think that is also fair. Because if you are in a good position, you should not change things too much. On an educational level, you should avoid too many drastic changes as well. You need a very good reason for a major change as each change has strong implications for students. When possible you should change gradually.

Furthermore, we should not only focus on the money we receive from the central organisation, although you should fight for it. Most opportunities are outside, we should just go together outside. There is much more there: industry, EU projects, national research funds.

It is one of the things Jacco (Hoekstra, the previous dean) did really well: make that position very strong and not lose what we have. I think the large opportunities are outside. That is also why going together helps, so that would be theme one: going outside together. Not always and not everyone, but for instance aerodynamics and structures, or flight performance, aerodynamics and control on flow control, going out into the world, looking for outside partners.

That would be theme two: external relations. I think we’re doing really well and have a great position in the EU. If you look at what our researchers do, they have lots of relations. About a third of our budget already comes from outside: from subsidies, but also from company projects coming from outside. People are really busy acquiring money for PhD students, post-docs and projects, but I think we can do it more strategically: use me. Scientists working together with researchers from Airbus, DLR, Fokker, NLR and then I maintain relationships with the CEOs or CTOs of the companies, going out there to get stronger ties.

The third theme is education, which is actually number one. There’s nothing wrong with our educational programme, it is one of the top in the world I think. But we should keep it top of the world. Monitor

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how students are doing. Also important is our educational load. If you look at our faculty compared to other faculties, we have quite a high educational load for our scientific staff. So that you should also monitor. See if it is divided more or less equally. You can divide money, but you can also divide education.

You were the first female to be appointed professor and now the first to be dean so do you see a role for yourself in drawing more female students into engineering?

I certainly hope so. I really would like to have more female students. Because we miss out on a lot of talents. It’s 11% now and we come from 5 to 6% a couple of years ago. It has doubled in a couple of years’ time and I would like to see it doubling and doubling again.

In fact, female students at TU Delft currently perform better than the male students, but that is probably because we get the dedicated female top.

I think diverse teams work better. But how to do this? I read a few researches into that and I think one thing you can do is lead by example, to show it is possible. By being there and by being visible, girls can also think aerospace engineering might be for them. That is one thing I can do: whenever I can appear somewhere, I will do it.

Internally, there are several things I would like to do: of course talk to the female scientists, PhD students and regular students how it is going and whether we can improve something for them. One thing that’s really nice at the TU Delft is the fellowship they have for assistant professors or associate professors. We keep a look out and ask the department chairs or professors to keep an eye out for high quality female scientists. And we have the Tinkerbell scholarship which Jacco started, which is for female PhD students. We have very good MSc women doing great research who would like to pursue a PhD, so I would like to support them as well. But I think it already helps being there, showing that it is possible.

Which future developments do you foresee in the aerospace industry and how will they influence the faculty?

If you take a look at what lies ahead for aerospace, I think this is a great time to be the dean of this faculty. There a number of major challenges.

The number of flight movements grows each year, but there environmental constraints become stricter and stricter. There is an enormous challenge: not only CO₂, but also NOₓ and noise emissions will need to be reduced significantly.

In the space industry, there are several trends. One major trend is the ongoing miniaturisation of spacecraft and components, which leads to interesting new possibilities. Another exciting development is the advent of commercial space travel. In the field of wind energy the major challenge is at sea: there is a need for robust offshore wind energy solutions that are significantly more cost-effective.

All these developments will require smart aerospace engineers designing new solutions. In our strategy for the faculty, we took that into account.

If you could give one piece of advice to students, what would that be?

I would go for balance. In your student life, you can get so busy: studying, social activities, perhaps design activities in student teams. You might also have a job, so you can be short for time. Keep an eye on the balance and really make sure that your percentage of studies doesn’t go below a certain critical limit. Keep your studies going and then balance it with activities outside. But also, start immediately. I think students lose time and we might even lose students who wake up too late. It’s quite a change from high school to university. The sooner you realise this and really start, the higher the chance of success is. And maybe I can do something there, too.

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