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# TOILING AWAY IN ZÜRICH

«According to many rankings, ETH Zurich is the leading university of technology in Europe. Students spend an average of 5.5 years on their study. At TU Delft, this is somewhat longer: an average of 7.2 years.»

Connie van Uffelen

## «O MY GOD, YOU'RE FROM ETH!»

24-year-old Nadine Spielmann, Bachelor's student in architecture, did not know what struck her when she came to study for a semester at TU Delft last spring. «Delft wanted to know everything about my university. I now see it as an honour to study at ETH.» It will therefore come as no surprise that many TU Delft students would like to spend some time studying at this university. With its numerous Nobel laureates, the Eidgenössische Technische Hochschule (ETH) is not only prestigious but also ambitious and very internationally oriented. And, oh yes, no one less than Einstein received his diploma there in 1901.

That fires the imagination, just like the effect of the stately main building from the second half of the nineteenth century. The dome-shaped entrance in neoclassical style gives the building grandeur. Yes, even qualities of a cathedral, with its marble statues and two-story colonnaded galleries. Between the galleries, classical meets modern: glaring lights light up contemporary scale models, researchers display their posters there with the latest research results. Seated in corners in front of colourful frescoes, students plunge themselves into their coursework behind laptops, either in groups or on their own. Because serious studying takes place at ETH.

## FEELING GUILTY

That is what the TU Delft Electrical Engineering Master's student Dejan Borota (22) quickly found out last September during his Erasmus exchange programme. «On the fourth day at ETH, I came across a Greek boy I'd got to know. I asked him how he was. He said: I'm so tired; I studied till two o'clock last night. It was the first week! I immediately felt guilty that I hadn't stayed up late studying.» Potential new students at ETH not only receive information about the study programme, but also about what it is like to study there. «We invite all first-year students for half a day before the start of the study and explain to them that studying at ETH is a full-time activity» says Regula Christen, head of study orientation and coaching. «ETH is well-known for being intensive. We want to make students aware of how important it is here to keep up with everything right from the very start.»

Whoever is thinking about studying architecture can take a look beforehand at the public criticism of the work of current students. They have to present their work to other students, professors and their assistants. «Tears are actually shed, because they've stayed up many nights working and their work is pulled to pieces, literally» says Dr. Christoph Niedermann, Academic Secretary to the Rector.

**Working through the night.** Architecture student Nadine recognises this. «I sometimes say to myself that I really need to have eight hours sleep.» She is currently following the most important course of her Bachelor's: the so-called 'studio'. For this, she must create designs on a theme in two or three months. Students work on their own or in groups. «The workload is just crazy: some people work non-stop.»

## RESITS

Although architecture is one of the most demanding studies in Zurich, a study by the Swiss federal statistics office four years ago showed that students at ETH spent an average of 45 hours a week on their study. «Not throughout the whole year, but above all during the semesters» says Dr. Dieter Wüest, head of the rectorate. These semesters are quite short by European standards: the autumn semester lasts fourteen weeks, the spring semester fifteen.

Wüest believes that the system of examination is one of the reasons why students study quicker in Zurich than in Delft. Most of the examinations, some eighty per cent, are so-called session examinations at the end of a semester break. One session is four weeks in August; the other is from mid-January to mid-February.

In addition, particularly with Master's programmes, there are also semester examinations in the final week of the semester or in the first week after it. Students may only resit a course once. If they do not pass it, the course will be lost, but they may compensate it with another course. ETH does not want any stumbling blocks.

Finally, there are also tests throughout the semester in which, for example, students have to write a report or give a small presentation. Only the senior students are tested in this way.

First-year students are only examined at the end of the year, in August. This block of examinations is also referred to as the 'basic examination' and comprises between six and nine subjects, depending on the degree programme. Students have a period of ten weeks to prepare for this.

On a scale of one-to-six, where six is the highest, first-year students have to achieve an average of four (i.e. 60 percent) for the whole block. Whoever scores lower than a four has to resit the whole block within a year and has only one chance to do so. Those who do not pass it then have to leave ETH. The second year is less strict, depending on the degree programme.

## DURATION OF STUDY

According to a study from 2007 into the 7269 students who started at ETH in the period between 1995 and 1999, one third

of students do not achieve the first-year examinations. 12.5 per cent left ETH before the first examinations; five per cent failed once and did not take a resit and 6.9 per cent failed twice. «We don't think this has changed significantly» says Wüest. The first year is therefore a selection year. «We wouldn't want any selective intake. We're very satisfied with this system.»

In addition, there is a maximum duration of study: five years for the three-year Bachelor's and a maximum of twice the duration of the Master's. Master's programmes at ETH normally last three semesters, sometimes four, as with architecture. This study programme, along with a number of other programmes, has a compulsory six-month internship during the Bachelor's.

At TU Delft there are four examination periods throughout the year, also for first-year students. When Nadine Spielmann took an examination at TU Delft, she was surprised once again. «People were leaving after only ten minutes! A roommate had studied for an examination, but decided not to take it. She said: I wasn't up for it. That was really strange. If you do not pass a course at TU Delft, you can take it the following year or the year after that, says Dejan Borota. There are no limits to the amount of examination resits at TU Delft. «Unlimited?» wonders Benno Volk from the educational development unit at ETH. «It seems to me that this is one of the most important differences between TU Delft and ETH Zurich. At ETH the processes concerning the possibility to repeat the different types of examinations and the duration of the Bachelor and Master studies are defined precisely so that there is no doubt of how things should be done and when.»

## PARENTS PAY

Rahel Zoller believes that students do not really make an issue of these strict rules. She is president of the Verband der Studierenden an der ETH Zürich (VSETH), which officially represents the students at ETH.

«People see the one-off resits as a given fact. If you've cleared the hurdle of the foundation examinations, it's something you can be proud of. You're suitable to study at ETH. Some students might want more freedom of choice in the composition of their study plan.»

Zoller doubts whether one-off resits actually reduce the duration of study. «Because if you have failed once, you will certainly want to pass the second time. I know quite a few people who delayed taking their resit until another semester because they were afraid of being insufficiently prepared. That prolongs the study. People who fail their examinations at a second attempt have to leave and are therefore no longer part of the statistics for average study duration.»

What does play a part in the shorter study duration at ETH is the fact that students need permission when they want to study

**for longer than seven years.** «Which means when it takes longer than five years for your Bachelor's and two years for your Master's. If you have a good reason, you'll receive permission, but people do their utmost to finish within the allocated time.»

**In addition, parents in Switzerland are obliged to pay for their children's first study, according to Zoller. In the Netherlands the situation is different and many students have a job on the side.** «Working while studying for a degree at ETH is not at all easy» says Zoller. «Most students are therefore relatively dependent on their parents. Some of them are perhaps under pressure to finish as quickly as possible, while others probably put themselves under pressure so as not to be a burden to their parents.»

**Another reason according to Zoller could be that Switzerland is small, just like the Netherlands.** «Quite a few students live with their parents, as the ETH is generally within commuting distance. Students don't tend to get together very often in the city of Zurich. They already have their friends and a life when they start their studies. I think that this could be a reason why students at ETH see their studies as more of a job.»

## STUDENT LIFE

**Is there still time for a thriving student life, as in Delft?** «Time is not something you automatically have, you have to make time» says Zoller. «You have to make compromises. We do have student societies that organise small parties, events and excursions to businesses. VSETH organises activities that are too big for the student societies, such as a party for 1500 people at the beginning of the new autumn semester.»

**Nevertheless, TU Delft students at ETH find student life in Zurich far less prominent. Students primarily play sport together.** «Where we in Delft go to the pub, in Zurich they go cycling on mountain bikes in the mountains or canoeing» says Marlies Vasmel, who spent two half-year periods at ETH and graduated there in Applied Earth Sciences. «It was very difficult to explain to people in Zurich what student life signifies» says Lotte Willems who followed electives at ETH for her Master's in Micro and Nano Engineering. «When I came to study at TU Delft, I really wanted to enjoy my student life. At ETH, you're not going to lounge about during your studies.» **When the Bachelor's-Master's degree system was introduced at ETH, students were even asking what the minimum time was in order to graduate, tells Christoph Niedermann.** «I don't know whether this attitude of having to work, sweat and toil at ETH is only positive, but it is the attitude here.» **That was also what struck Dejan Borota when he took some courses in robotics in Zurich:** «The ambition to perform is very high here. I'm not quite sure what that is down to, but you just want to work hard. The examina-

tions here are in two-and-a-half months and I already have the feeling I'm falling behind. That's not case, but I do have to keep up.» **That is done by means of homework. A lot of homework. It is not compulsory, but you do have to achieve a percentage of your homework points to be able to participate in an examination. The exercise assignments are discussed each week by the professors' assistants, in groups of twenty students.**

## SPORTS AND STUDYING

**ETH does provide an environment that keeps students longer in the university, observes Borota.** «There's an enormous sports centre here, which is very accessible with various programmes every hour. It's quite normal to go and do some sports, shower and then continue studying. The refectory offers warm meals for lunch and in the evening at very reasonable prices.»

**On Wednesdays, Borota only has lectures from one o'clock to three, but he is already there at ten in the morning.** «I will either work with a study mate or do some sports, because in the morning it's relatively quiet. This is followed by lunch, attending lectures, then studying again, dinner and another sports programme. This means you can be here for ten to twelve hours on a day with only two hours of lectures. In Delft, I would sooner not attend the lectures and spend the day completely differently.»

**A bell suddenly rings out in the stately main building signalling the next lecture. A bell? But of course. Students hurry to their rooms.** «There's a mathematics lecturer here who nobody can keep pace with» continues **Borota.** «I sometimes think to myself, how will we ever pass this? But then the lecturer will say that it's normal if we don't understand something and that we should read it again at home.»

## BETTER ENGINEERS

**It can also be done differently, as can be seen in a linear algebra lecture for a group of some 450 first-year students. Their professor is quickly writing mathematical derivatives on the blackboard. Everyone diligently writes them down. Halfway through, two students put their hand up, but the professor does not see them. Someone knocks on a table to attract attention. Why? The professor has made an error and is being corrected. Apologies. Commotion. Grumbling. Everyone now has to change their notes.**

**Mathematics student Jarno Hartog believes the level is higher at ETH than at TU Delft.** «I noticed a gap between the knowledge I attained from the Bachelor's at TU Delft and the knowledge of the mathematics students here. During the first probability theory lecture for my Master's at ETH, they started talking about sigma-algebra. I'd never heard of it, even though I'd taken three courses in probability

theory. This has now been addressed at TU Delft.»

**The question that arises is whether ETH graduates are better engineers?** «No, even though I think they might have more ready knowledge. At TU Delft, there are more creative engineers who are independent» says **Master's student Lotte Willems.** «More creative because they have more freedom and are therefore able to develop themselves more and better. You need a mixture of both types.»

**When you look at a longer study duration, I think that TU Delft students graduate as more mature students** says Prof. Hansruedi Maurer, coordinator at ETH of the joint Master's in Applied Geophysics. «The duration of study is one thing, but personal development is something else. Of course, we could push students through the programme, but whether that makes them better qualified is another matter.»

**And Nobel Prize winner Einstein, who studied and taught at ETH?** «Einstein was an average student» pronounces Jarno Hartog objectively.

Eidgenössische Technische Hochschule Zürich, founded in 1855 by the Swiss Confederation as a polytechnic institute, the Eidgenössische Polytechnische Schule.

Delft University of Technology, founded in 1842, as 'Royal Academy for the education of civilian engineers, for serving both nation and industry, and of apprentices for trade'.

16	FACULTIES	8
24	BACHELOR'S PROGRAMMES	15
41	MASTER'S PROGRAMMES	30
12'482	STUDENT POPULATION	17'249
350	PROFESSORS	195
4'644	ACADEMIC STAFF	2'539
2'276	SUPPORT STAFF	1'854
95'000	TOTAL BUDGET PER STUDENT (euros)	31'590
5.5	AVERAGE TIME SPENT ON STUDY (years)	7.2
45	STUDY HOURS A WEEK	35
once	NUMBER OF RESITS	unlimited (in the future once a year)
21	NOBEL LAUREATES	3
24.4 (students who started in 1995-1999)	PERCENT OF DROP-OUTS BEFORE THE SECOND BACHELOR YEAR	30 (stopped and negative binding recommendation on continuation of studies 2011-2012)

*Connie van Uffelen, born 1967*

studied Biotechnology at the Van Leeuwenhoek Instituut in Delft and Journalism at the Academie voor Journalistiek en Voorlichting, Tilburg. She is now editor of Delta, the bi-weekly magazine of TU Delft. She also writes for Delft Integraal and its English version Delft Outlook, the scientific magazine on research at TU Delft.

Comparison between ETH Zürich and TU Delft published in 'Delta' on December 17th 2012