I LOVE TO SHARE KNOWLEDGE

A personal perspective on academic teaching

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global young faculty

PREFACE

"TO TEACH IS TO LEARN TWICE."
JOSEPH JOUBERT

GLOBAL YOUNG FACULTY

The Global Young Faculty is an initiative of Stiftung Mercator in cooperation with the University Alliance Ruhr and is coordinated by the Mercator Research Centre Ruhr in Essen. The program brings together outstanding and dedicated young researchers from universities and non-university research institutions based in the Ruhr area. It supports them in their efforts to forge new professional contacts and share ideas beyond institutional and disciplinary borders.

MERCATOR RESEARCH CENTER RUHR

Founded in 2010, the Mercator Research Center Ruhr (MERCUR) is a joint initiative of Stiftung Mercator and the University Alliance Ruhr (UA Ruhr), which comprises the neighbouring universities of Bochum, Dortmund, and Duisburg-Essen. Through a range of funding programs for joint projects between the three universities in the fields of research, teaching, and administration, MERCUR supports strategic cooperation within the UA Ruhr.

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ACADEMIC TEACHING – A GLOBAL PERSPECTIVE

Being excellent in research and teaching simultaneously seems to impose a double burden on academics working at universities. The 'publish or perish' society rewards scientific publications and funding raised, but the role of being a good teacher in a scientific career seems to be less well defined. This presumably leads to minor investments into the preparation of lectures and teaching material and a general hesitance in the adaptation of innovative new techniques. This is a problem, but is it specific for German academia or reflected globally?

To shed light on this question, we, young researchers on the verge of establishing scientific independence, set out to collect personal experiences from young colleagues and established researchers from all over the world. The current book presents a selection of the interviews, showing a broad spectrum of subjective views on the balance between teaching and research and the importance of teaching for a successful academic career. Background information on the educational system and academic organisation in the different countries help to put the statements into perspective.

But this book is not about hard facts and statistics, it is about sharing personal experiences, may they have been frustrating, motivating, edifying, or simply funny. We did not intend to give an objective overview of teaching all over the world, and we do not claim anything to be complete. We wanted to create an entertaining, informative, and motivating read for young researchers and academic teachers with different views and solutions on the problem of the research-teaching dichotomy.

We hope that the collected stories will stimulate discussions, illustrate interesting teaching approaches, and give new impulses for the improvement of academic teaching in the next decades.

The Global Young Faculty IV, Subgroup Communicative University

April 2017

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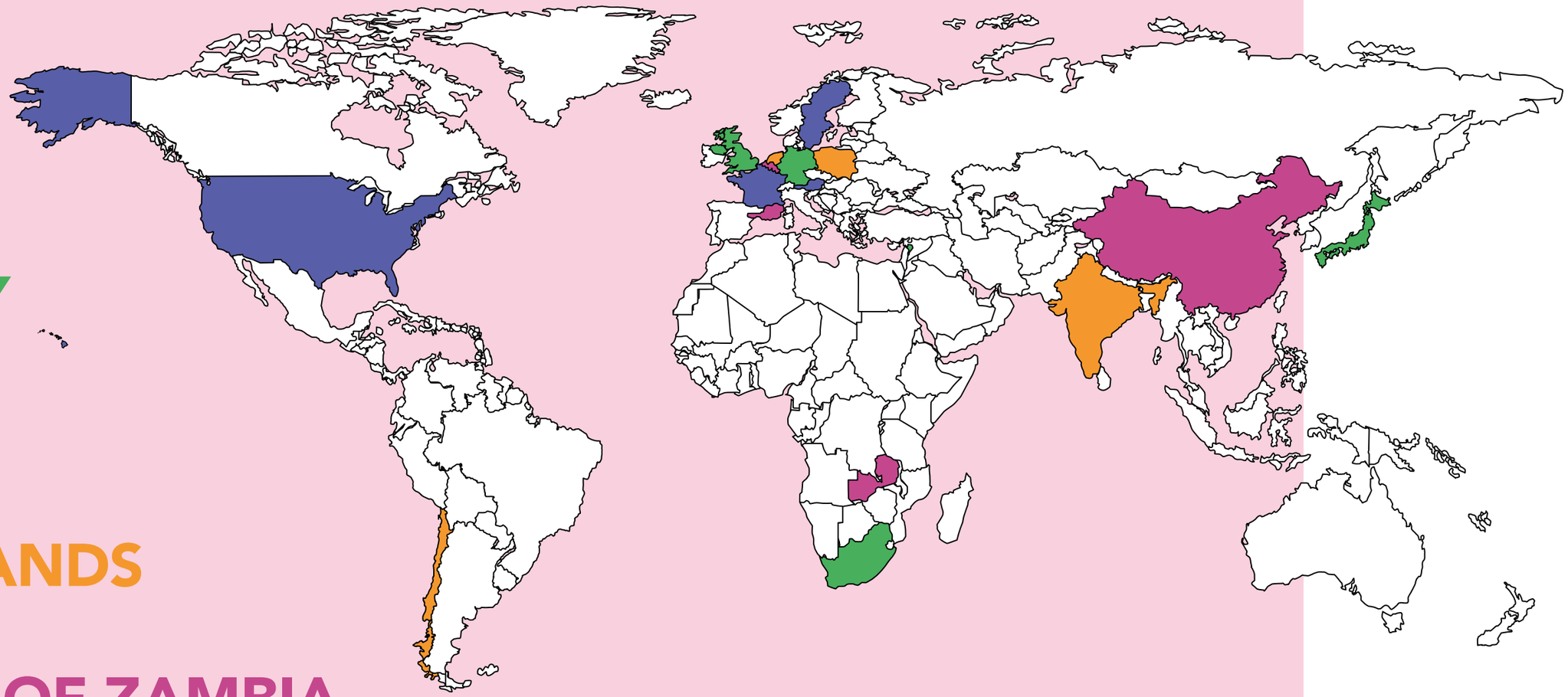

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HOW IMPORTANT IS/WAS (GOOD) TEACHING FOR YOUR PROFESSIONAL CAREER?

Banerjee: I think that it is important, but it is also important that you maintain an active level of research. But when you do good teaching, you attract a lot of students, so you get motivated students. And the second thing is that in the institute people do recognise that you do good teaching.

Muheim: For my immediate future it doesn't count too much. If I wanted to change to other universities, then it becomes important I am sure.

Abe: Now I'm an assistant professor, so probably I want to get an associate and then full professorship. However, for those promotions, maybe good teaching is not too highly valued. The main part is research.

Du: For a teacher, such as some person in the lecturer period, if he or she wants to be promoted to associate professor, the teaching evaluation is very important.

Jaalouk: When the time comes for me to apply for promotion, or eventually for tenure, they will look at my teaching performance.

Aldridge: Good teaching is not insignificant in terms of progressing through your career.

Bojańczyk: There is very little incentive for good teaching, getting new positions is based mainly on research . . . as long as you come at least once every two weeks and you are sober, nothing bad is going to happen to you.

Lindner: If you want to have an internal promotion. For this, I think it's the only moment in which teaching is evaluated, but, in general, teaching is not very important for a professional career.

Anderson: It is important. It's definitely more important at the Naval Academy than at other universities. They sort of turn that around here and say, "We expect you to be an excellent teacher. However, you won't get tenure if you don't publish through journal papers."

Krans: For getting tenure, it's important that you do the right amount of teaching. But for research they also look at quality and output. So, teaching is important, but it's not looked at in depth.

Lange: I had all those restricted contracts for one or two years, in which I did a lot of teaching. Actually, having the students' evaluations, and them being fairly good, did help to get my current position.

AUSTRIA

As an EU country, Austria is part of the European Higher Education Area, the Bologna process towards comparability and coherence of higher education in Europe, and the ERASMUS+ program. On the national level, legislation and execution is a responsibility of the Federal Ministry for Science and Research. In the case of private universities, a specific accreditation council (Agency for Quality Assurance and Accreditation Austria) is additionally accountable. However, the higher education institutions also have their own organizational structures; the federal institutions, rather, have supervisory and regulatory functions.

Usually, students finish secondary education at age 18. If they successfully complete the Allgemeine Universitätsreife (upper secondary matriculation examination), they are generally entitled to freely enter tertiary education and select study programmes. However, for specific study programs, such as medicine or psychology, tertiary education institutions are allowed to use selective admission procedures comparable to the German numerus clausus (EURYDICE 2017). Typically, Bachelor programs take three years. However, at colleges of teacher education, the Bachelor studies are designed to take four years. The Master and Diplom programmes (ISCED level 7) are scheduled to a length of one and a half to two years.

Higher education is primarily financed by government funding. The expenditure per student in tertiary education is approximately as high as in Germany. The gross domestic expenditure on research and development is almost 3% of Austria's GDP, while almost one quarter is spent on the higher education sector (UNESCO Institute for Statistics 2017). Generally, there are no tuition fees in Austria. Exceptions hold for students at private universities and universities of applied sciences, non-EU students, and students exceeding the regular study cycles. There are no student loans but grants in terms of direct (cash) or indirect (e.g., family allowances and tax reliefs per child) support of study (European Commission/EACEA/EURYDICE 2016).

In the tertiary school age cohort, the gross enrolment ratio in tertiary education (ISCED levels 5 and upwards) is more than 80%. It increased distinctly from about 50% since 2006.

A higher ratio of women (almost 90%) than men (74%) is enrolled. The share of graduates—in terms of first degrees in Bachelor's and Master's or equivalents—in comparison to the higher education age population is approximately one-third (UNESCO Institute for Statistics 2017).

Most higher education institutions are public. There are 22 public universities like the University of Natural Ressources and Life Sciences in Vienna, 21 Fachhochschulen (universities of applied sciences), and nine Pädagogische Hochschulen (university colleges of teacher education). Additionally, Austria has 12 private universities and eight private university colleges of teacher education (EURYDICE 2017). The public University of Vienna counts among the current top 200 universities in the Times Higher Education Ranking with a placement of 161 (Times Higher Education 2016).

Almost half of all researchers work in the sector of higher education and the other half in business enterprises. Only few researchers are employed by the government or non-profit organizations. Interestingly, less than one-third of all researchers are female (UNESCO Institute for Statistics 2017).

Austria		Year
Expenditure per student in tertiary education	17,114 PPP$	2013
Gross domestic expenditure on research and development as percentage of GDP	2.98%	2014
Gross domestic expenditure on research and development by higher education sector	24.32%	2014
Gross enrolment ratio in tertiary education	81.54%	2015
Gross graduation ratio (ISCED 6 and 7, first degrees)	34.38%	2014

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Isa Steinmann & Rolf Strietholt

KLAUS HACKLÄNDER

Position: Full Professor

Institution / Country: University of Natural Resources and Life Sciences, Vienna, Austria

Subject: Biology

Teaching time: 11 years

Teaching load: 12 ECTS

Teaching Bachelor / Master / Graduates: Bachelors, Masters, PhD

Interviewer: Pascal Malkemper

Interviewer: Are you happy with the status and the prestige of teaching in your country, and why?

Hackländer: You know, I'm not 'happy', I don't think about these 'happy' categories, but I think in general, higher education teaching, the whole school issue, is not highly valued in Austria. You can easily see it when you see how teachers are treated, how much they get paid, and how much they are the ones who are blamed for something that happens at school, although they do a lot. So, I would say that for society, teaching at university is nice to have, but not more than that. I think people are very interested in research, but they don't see that researchers are doing teaching. So this is a bit under-represented in the minds of the people. It is, however, highly appreciated by the university rectorate, and they also did a lot of activities in the past to even increase that by giving teaching awards, innovation prizes, things like that related to teaching.

Interviewer: Do you think good teaching was important for your professional career at some point?

Hackländer: Well, I did not have to teach before I got my professorship. So at that time (2005) our rector was more keen on research. I think I did a good job at representing myself in the hearings and with my talk when I applied for the professorship.

CITATIONS

And when I talk about science, I try to convince them that this is the best thing in life.

So I was once singing in classes . . .

They were convinced that I would do it in the correct way, so it was just luck. But, on the other hand, now the new rectorate since 2006 have changed their mind, and if you want to do a habilitation at our university, if you want to apply for a professorship, then you have to split your talk when you apply for professorship into two parts. One is a teaching example, for 20 minutes, for Bachelor's [students], for example, and one is a talk for researchers, like conference-level or something. So we have more focus on this teaching stuff. And also in the application documents that you have to submit, you need a teaching portfolio, so you have to think about what teaching you want to do and how do you want to do it. So this is getting more and more important, because 50% of our workload is teaching.

Interviewer: So would you say there is equality between the importance of teaching and research?

Hackländer: No. Equality – I wouldn't say that. Because the first step is that one is really leading in their field in terms of research, publications, and third-party money is very important. But there's another filter of course applied, which is leadership.

Interviewer: What is your most effective teaching technique? Which one do you like most?

Hackländer: Well I like the classical talk the most. Lectures.

Interviewer: Do you use the internet for teaching?

Hackländer: Yeah, well not me personally, but we have colleagues in our institute who use this e-learning tool heavily. So, for example, for the courses on species identification, they have a lot of interactive question-and-answer tools to increase their expertise in species identification. So these e-learning courses are there, but it's still, I think, not a big thing for us. Most people are aware that organising, preparing this e-learning stuff is very, very time-intensive, and therefore some are more reluctant about that.

Interviewer: How do you motivate your students to do what you want them to do?

Hackländer: Well, I try to convince them that the things they do here at university are the best things in their lives. They are here voluntarily, so it's not obligatory like in school, so I expect that they really want this stuff. And when I talk about science, I try to convince them that this is the best thing in life. Ignite them, show them that this is inspiring me, that science also gives me the strength to survive all this stuff here with 12,000 students, because we do things that we like.

Interviewer: Is there any story or moment during teaching that you encountered, which sticks in your mind, that was maybe funny or special?

Hackländer: So, I was once singing in classes . . .

Interviewer: Generally? Like, regularly?

Hackländer: No, just like a fun part. They were lecturing on breeding systems, monogyny and polygyny. And people were all mixing up polygamy and polygyny, and then I was giving a little example of how to keep it in mind by singing a song about a hamster. There was a hamster living in polygyny, so he has several wives, and there was a hard winter, and it came to reduction of the females, and it was bigamy and monogamy and 'unamy' at the end [both laugh]. Like, you laugh, people always remember that story, and they – but it's not only that it was a fun day because I was singing, but now they know the differences between stuff.

BELGIUM

Isa Steinmann & Rolf Strietholt

Belgium is an EU country and belongs to the European Higher Education Area. It participates, for example, in the Bologna process and the ERASMUS+ program. The federal state sets certain standards such as minimum requirements for issuing of diplomas. Under this common umbrella, the Ministry of Education and Training in Flanders, the Ministry for Higher Education in the French Community, and the Ministry of Education in the German-speaking Community act independently in all further legislative and executive matters.

Students qualify for tertiary education with a certificate of upper secondary education in all parts of Belgium. However, sometimes admission requires subject-specific admission tests (e.g., in medicine, arts). Further, the language of instruction differs between the Communities, and students need to prove specific language skills in the respective Communities. In Flanders, higher education institutions comprise Hoger Beroepsonderwijs (offering higher vocational education), which usually take two years, as well as Bachelor, Master, and doctoral programs at a Hogeschool or Universiteit (universities). In the French Community, there are dual vocational education offers at Hautes Écoles, which take—depending on the subject—three to four years, as well as regular Bachelor, Master, and doctoral studies at Universités (universities). These studies that are equivalent to ISCED level 6 are scheduled to three years, and level 7 to two years in Flanders and three years in the French Community. As the German-speaking Community is rather small, there is just one higher vocational education program type, and only Bachelor programmes at only one college, the Autonome Hochschule, which take three years (EURYDICE 2017a, 2017b, 2017c).

Tertiary education is primarily financed by federal funds. In comparison to Germany, the expenditure per student in higher education is with less than 14,000 PPP$, rather low. The gross domestic expenditure on research and development amounts to almost 2.5% of Belgium's GDP, while one-fifth is spent in the sector of higher education (UNESCO Institute for Statistics 2017). In all three Communities, students can receive needs-based student grants, tax benefits, family allowances, and—except for the Flemish Community—loans. Furthermore, tuition fees are charged everywhere. In the Flemish Community, the tuition fees usually relate to completed credit points in the European Credit Transfer and Accumulation System (ECTS), while in short-cycle tertiary programs, the fees depend on the attended teaching hours. In the French Community, the tuition fees for students are regulated as well and depend on the financial background of the students. Furthermore, universities and non-university higher education institutions charge different fees, and EU and non-EU students are charged differently. In the German-speaking part, students from inside and outside the EU pay the same fees in their first cycle studies, which amounts to about half of the fees in the other Communities (European Commission/EACEA/EURYDICE 2016).

The gross enrolment ratio in tertiary education is more than 70%. A higher ratio of women (almost 83%) than men (64%) is enrolled. The share of graduates—in terms of first degrees in Bachelor's and Master's or equivalents—in comparison to the higher education age population is 44% (EURYDICE 2017a, 2017b, 2017c).

In Flanders, there are seven universities, 22 university colleges, which are rather profession-oriented, and other institutions for higher education (e.g., management schools). There are also private registered higher education institutions. In the French Community, there are six universities and six Hautes Écoles or art colleges. In the German-speaking Community, there is just one college (UNESCO Institute for Statistics 2017). Three Belgian universities are ranked in the top 200 of the Times Higher Education Ranking with KU Leuven scoring the highest (with a rank of 40) (Times Higher Education 2016).

Almost half of all researchers work in the higher education sector. A little less than the other half work in business enterprises, and rather few are employed by the government or private non-profit organizations. Gender is not balanced among researchers, only one-third of them are women (UNESCO Institute for Statistics 2017).

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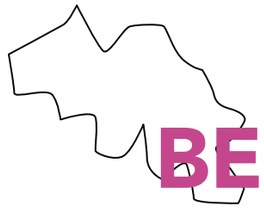
Belgium		Year
Expenditure per student in tertiary education	13,697 PPP$	2011
Gross domestic expenditure on research and development as percentage of GDP	2.46%	2014
Gross domestic expenditure on research and development by higher education sector	20.21%	2014
Gross enrolment ratio in tertiary education	73.32%	2014
Gross graduation ratio (ISCED 6 and 7, first degrees)	44.43%	2014

JULIE KRANS



BELGIUM

Position: Assistant Professor

Institution / Country: KU Leuven (Katholieke Universiteit Leuven), Belgium

Subject: Psychology and Educational Science

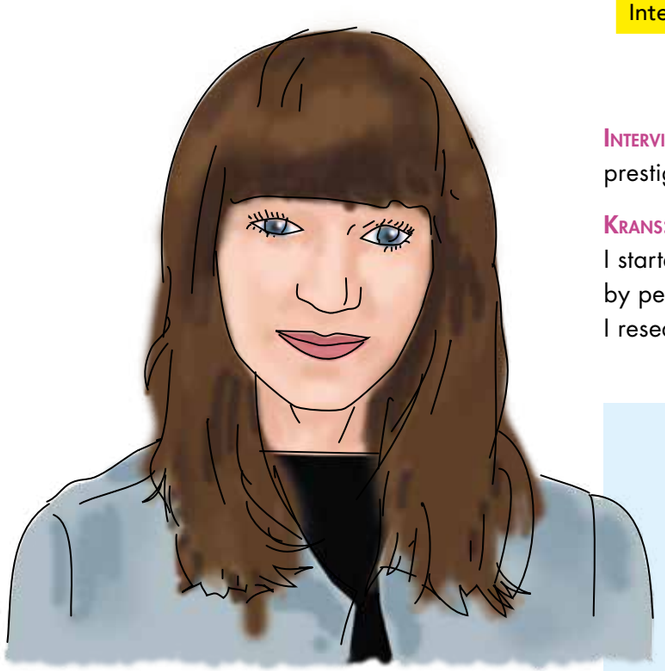
Teaching time: 12 years

Teaching load: 50% of total time or more

Teaching Bachelor / Master / Graduates: Bachelor, Master, Post-graduate

Teaching methods: Lectures, small groups, individual

Interviewer: Marcella Woud



Interviewer: Are you happy with the status and prestige teaching has in Belgium?

Krans: In general, yes. For example, when I started working in Belgium, I was asked by people what I teach rather than what I research.

Interviewer: How do you asses the significance of teaching in the scientific system of your country?

Krans: I think teaching is valued highly. In the university there are a lot of meetings about teaching, and there are a lot of teaching evaluations, so most people take it very seriously. But if you are applying for a promotion, then research appears to be more important.

Interviewer: Do you feel supported in your role as an academic teacher?

Krans: For the most part. We get training, and there is an accreditation system when you teach. Receiving administrative support and help in getting the right people for the right job – for example, for clinical courses – would improve it even more.

Interviewer: And how important is, or was, good teaching for your professional career?

Krans: At this moment, I look at teaching in light of getting tenure. There, I think it's important that you do the right amount of teaching and that students are generally satisfied.

Interviewer: Students expect that you are well-prepared and are open for questions. Conversely, what do you expect from your students?

Krans: I expect them to be interested and ask questions, which I think is not always easy, especially in large groups. I don't expect every student to be interested, but if they are not then I'd rather not have them in the class. Also, I expect them to be prepared for the lecture.

CITATIONS

I try to make it as relevant as possible for them, with enough room for their own thoughts and considerations.

The students liked that I shared personal experiences that made it funny, but also relatable to them.

Interviewer: And how do you motivate students in the case when they are not interested?

Krans: I try to motivate students by making the lectures significant to them. So, I always think about why they should care about the information in the lecture. Being a student and preparing for becoming a clinical psychologist, what could be important for them? So, I try to make it as relevant as possible for them, with enough room for their own thoughts and considerations.

Interviewer: In one sentence: why do you teach?

Krans: To share my enthusiasm for the topic.

Interviewer: Isn't it boring to teach the same things over and over again? How do you keep your enthusiasm?

Krans: If I give the same lecture every year, then I try to update the lecture and see if there is new information on the topic. Then it's interesting for me too, because I learn as well. If I do a practical course, then it's actually quite nice, because the group is always different. For some groups you really have to interact with them, some groups you have to give them the lead more – it's different for each group. So, besides the actual content, the way to facilitate their learning is also interesting.

Interviewer: And does teaching increase your happiness?

Krans: It depends [both laugh]. I am also happy without teaching, but it can be fulfilling if you see that people actually take away something that you try to convey – also to help shape an individual's outlook on the world, but perhaps that's a bit of propaganda [laughs].

Interviewer: Where do you get new ideas for your lectures?

Krans: I use the internet a lot and from talking to colleagues. Also, courses where you learn about different methods of teaching, like flipped classroom techniques.

Interviewer: Can you describe the role or influence of the internet on your teaching.

Krans: I think it's an inspiration, from researching videos, articles, books, professional websites, and so on. Also, this year I also videotaped my lectures and put them on the intranet for the students so that they can review the lecture again. So, it helps 'decorate' and 'facilitate' my teaching.

Interviewer: Have you brought changes to teaching at your university?

Krans: Not yet [both laugh]. I think we do, as professors here, have quite a democratic input in how the teaching is organized in our faculty, and right now we are looking at reorganizing the clinical and health psychology course, and I have been asked to provide input as well. I am sure that these suggestions are taken very seriously and are considered.

Interviewer: OK, then three opinion questions: "Good teaching is . . ."?

Krans: . . . making the information as relevant as possible, but also being up-to-date.

Interviewer: And "Bad teaching is . . ."?

Krans: When I was a student, there was one teacher who was hard to understand, but the teacher didn't see that problem. We didn't agree with a lot of things that were said, but he wasn't prepared to engage in a discussion about it, and I thought that was bad teaching because it made me dislike the topic. I felt that we as students were punished for asking critical questions.

Interviewer: Can you share a special moment or story that you encountered during teaching?

Krans: When I was working at the University of New South Wales in Sydney, I taught a tutorial. It was a small group of maybe 15 students, and it was a flipped classroom model. I gave examples from my own clinical experience as a therapist, but also examples that did not go well to illustrate the theory. I told them about when I was doing my clinical training, my very, very first patient, who I picked up from the waiting area, and she was sitting there with her boyfriend, and then I

panicked and turned around and went back to the student room. It made the students laugh and really pay attention. The students liked that I shared personal experiences that made it funny, but also relatable to them.

Interviewer: A more philosophical question: what is the main task of university education?

Krans: I think the main task is to sculpt people's minds into the best practices of the course that they elected.

Interviewer: Where do you see teaching at the university level in 20-30 years?

Krans: Well, there has been a lot of talk about online courses; I think it's going to be quite big. Maybe this way the costs will decrease, which is important for countries in which the cost of studying is high. But I think the classic form of university teaching will still be there, because for the students it is also a phase in life where a lot of things happen, when they develop networks with peers whom they will also work with in the future.

Interviewer: Do you have any advice for beginners in teaching?

Krans: You have to be well-prepared, so you have to know your topic really well, and when you are a beginner, you always feel like you don't know it well enough. But usually you are still one step ahead of the students that you are teaching, so that's good to know even if it doesn't feel that way. And, also, try to put yourself in their shoes, to think about how it would be relevant to them, and what you would want to know if you were them.

Interviewer: That´s all, thank you very much!

WHAT DO YOU EXPECT FROM YOUR STUDENTS?

Vernekohl: Normally, I do not expect them to be very well-prepared, but I expect them to be open to new ideas and to discuss them critically. And also to be able to value other people's insights and experiences and what they bring to the course.

Watanabe: I don't think I can expect the students to be well-prepared. Especially at high school, they work too hard to learn because they have to pass the entrance exams – it's really hard, especially for these top universities. And after enrolment, they like to feel relaxed, and enrolment was their final destination when they were high school students, so that after enrolment, some really, you know, don't want to study hard. They like to enjoy things.

Muheim: I expect them to be there, to listen, to think, and not just expect us to present everything to them but actually also to be interactive and participate and ask questions.

Barcelo: Not to fall asleep. I don't expect much from them – they are very good students. I think that most of the responsibility in a lecture is on the side of the professor, you really have to incentivise your students to participate.

Deressa: What I mostly expect from my students is commitment for hard work, and I always expect them to be ready any time for any kind of assignments or exercises.

Bojańczyk: Well, one simple thing is that I expect them to be smart, which is kind of an asshole thing to say, but there you go. And it's a reasonable expectation – we have very good students. Another thing that I would expect is just, you know, basic decency, like coming to class and not making noise. I think that my classes are extremely pleasant; the students are very good and it's just nice to talk with them.

Du: Most of all for me, I will tell the students to prepare for tomorrow, or the next course, before the class, because this is very important.

Jaalouk: In my class, they have to do a lot of assigned reading before they come to class. Also, I expect them not to agree with what I am explaining all the time, or even with the literature that we are going over. So, this is the expectation, that they have to be thinkers on their own and not take things at face value.

Painter: That they would be engaged. That higher education is an opportunity for them and not just the next step. The engagement to participate in the material, being excited to learn – that is my expectation.

Peres: Interest. That they are there because they want to be there.

Aldridge: For a tutorial, if they don't do the work and don't hand it in, then the college will throw them out pretty quickly. Part of the reason is that the college is actually the organisation that accepts them. And the flip-side of that is that it is in the college's behest to kick them out.

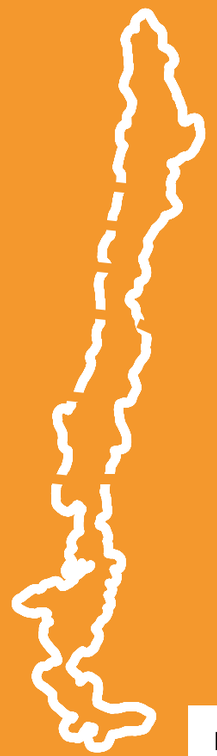
Lindner: When they come to class that they really want to listen to what I teach. If they are not interested, I would prefer that they not attend class. I think that the effect of being active and taking part in what happens is what I would expect from my students.

Frerich: Well, usually I expect and hope that the students are open to my ideas, so I don't want them to be little computers just repeating stuff that I did beforehand and not thinking about what is happening. So if I am engaged in doing the teaching job, I want them to be engaged in doing their listening.

Anderson: I think that like professors everywhere, we expect the students to have read the textbook, or at least to have cracked the spine and scanned the material. If I could get at least that far, I would be thrilled. I expect them to be able to use the textbook as a resource after class and not simply to rely on what I'm telling them in class.

Lange: I do like questions and interaction. I just enjoy lectures much more if there's interaction. So, the most important thing for me is that they do interact, that they do ask questions.

Krans: Well, I expect them to be interested and ask questions, which I think is not always the case, especially in large groups. I don't expect every student to be interested, but if they are not then I'd rather not have them in the class.



CHILE

In Chile, all tertiary education institutions need to be approved by the Ministry of Education and are supervised and monitored by it. However, in terms of the concrete concepts, organization, and funding, they are quite autonomous. The Chilean higher education system is privatized to a great extent. The higher education system comprises three types of institutions: universities and two types of vocational training institutions, Institutos Professional and Centros de Formación Técnica. If students finish secondary education successfully, they receive the Licencia de Educación Media Humanístico-Científica (the certificate of secondary education), which is required to enter tertiary education.

In some cases, there are further entrance examinations like the Prueba de Selección Universitaria. At universities, undergraduate studies typically end with the Licenciado degree (4-5 years), and consecutive graduate studies with the Magister (1-3 years), Postítulo (0.5-2 years), and Doctor (3-4 years), respectively. There are further profession-oriented degrees awarded at certain universities and the vocational higher education institutions (Ministerio de Educación 2017; WENR 2013).

With less than 4,000 PPP$, the government expenditure per student in tertiary education corresponds to less than one-fourth of the expenditure in Germany. The gross domestic expenditure on research and development is, with 0.4% of Chile's GDP, also comparably low. Almost 40% of the latter are invested in the higher education sector (UNESCO Institute for Statistics 2017). Less than half of all universities are public and receive government funding, all other institutions are private. Therefore, the tuition fees are high, and students can receive government-funded grants and loans (Ministerio de Educación 2017; WENR 2013).

The enrolment in postsecondary education strongly increased over the past years to 89%. A higher proportion of females are enrolled (94%) in comparison to males (83%), while gender is quite balanced in graduation ratios. With 13%, the gross graduation ratio in ISCED level 6 and 7 degrees is much lower than the enrolment ratio (UNESCO Institute for Statistics 2017). Overall, there are 60 universities, 45 Institutos Professional and 69 Centros de Formación Técnica in Chile (Ministerio de Educación 2017; WENR 2013). None of the Chilean universities is listed in the top 200 of the Times Higher Education ranking. The University of Santiago scored in the top 801+ (Times Higher Education 2016).

Less than one-third of all researchers in Chile are female. The majority of researchers work in the sectors of higher education (58%), fewer in business enterprises (25%), private non-profit organizations, and the government (UNESCO Institute for Statistics 2017).

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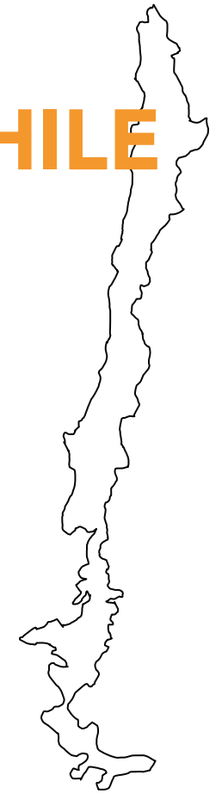
Chile		Year
Expenditure per student in tertiary education	3,837 PPP$	2014
Gross domestic expenditure on research and development as percentage of GDP	0.38%	2014
Gross domestic expenditure on research and development by higher education sector	38.89%	2014
Gross enrolment ratio in tertiary education	88.58%	2015
Gross graduation ratio (ISCED 6 and 7, first degrees)	12.96%	2014

Isa Steinmann & Rolf Strietholt

PABLO BARCELÓ

CHILE



Position: Professor

Institution / Country: University of Chile, Chile

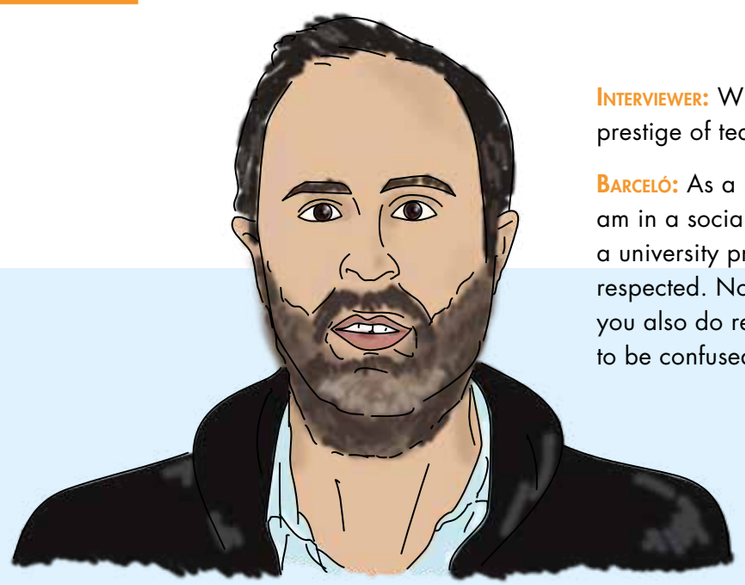
Subject: Computer Science

Teaching time: Since 2006

Teaching load: 3 courses per year, 3 hours per week each

Teaching Bachelor / Master / Graduates: Bachelor

Interviewer: Thomas Zeume



Interviewer: What do you think is the status and prestige of teaching in your country?

Barceló: As a university professor, when I am in a social meeting, and I say that I am a university professor, this is usually highly respected. Now, when you try to explain that you also do research and so on, people tend to be confused.

Interviewer: And how well-perceived is teaching at your university?

Barceló: Well, it's definitely something important. We care about students and we care about teaching. But I think that in our department we tend to keep a good researcher, even if he's not a good teacher. If they really see that you are not a good teacher they probably assign you some not-so-important courses, for you not to harm the students too much.

Interviewer: Are there some formal procedures in place for evaluation?

Barceló: Yeah, the students write formal evaluations in the middle of the semester and at the end of the semester. These evaluations are anonymous, and they are actually quite constructive, I would say. They don't want to kill you; they want to help you teach better.

Interviewer: This also means that the faculty cares about teaching.

Barceló: The faculty cares, of course, yes. Actually, the faculties here go through this certification process every certain number of years. If you don't have an evaluation process through which the students can evaluate the teaching, this is really bad for your certification.

Interviewer: Now we are going more in the direction of how you think students should behave in lectures. What do you expect from your students?

CITATIONS

. . . in my department, I would have to do very badly in teaching for them to really consider firing

Do you have any advice for beginners in teaching?
Be extremely well prepared. [. . .] If you don't understand all the details, then you don't understand.

The worst part of teaching for me is evaluating the students. I think that this is a flawed process.

Barceló: Not to fall asleep [both laugh]. I don't expect much from them – they are very good students. I think that most of the responsibility in a lecture is on the side of the professor. You really have to incentivise your students to participate, and I'm sure that if you do well – I mean you don't have to excel – if you do well, they will participate. They tend to be active, but if you are very boring they will fall asleep. Now, I have to say that when I was a student, I attended very few lectures, because I thought that they were very boring. For me, it's much easier to read it in a book. And I think that this is the feeling of students today, that they don't attend classes in which they feel that they only learn what is in a book.

Of course, when you teach discrete mathematics, it's very hard to teach something that is not already in a book – you'd have to invent something new to teach and that's not the point. But, in the end, I think that the only thing that you can transfer to your students is some level of passion, for them to go reading the book with a better attitude and to learn by themselves. So, what you try to transfer in class is "look, this is cool, this is interesting, this is deep, but at the same time it's not boring" – and this is what I try to do in classes.

Interviewer: How do you motivate your students?

Barceló: By being myself and trying to show that I like what I'm teaching. For this, you have to be extremely well-prepared. If they have this feeling, even if you fail, they will appreciate it more.

Interviewer: Another question about the motivation – or maybe it's a more philosophical question. Why does teaching increase happiness?

Barceló: Because while you teach, you learn. And for me, happiness is learning, essentially. Now, if you are asking me why teaching increases the happiness of the students, I have no idea. That is just why it increases my happiness [laughs] . . . I am very selfish as a professor.

Interviewer: What is the worst part of teaching for you?

Barceló: The worst part of teaching for me is evaluating the students. I think that this is a flawed process. I hate to build assignments – how do you make assignments? This is the worst part.

Interviewer: Which technique of teaching is the most effective? And which technique do you use most?

Barceló: I have no idea which techniques exist. I go and . . . [laughs] . . . talk about the things and try to involve the students with questions. Another thing that I have done with small classes, like machine learning, is that the students read the material before going to class and look at some books. This is great, because then you go to the class and you discuss the details, you clarify, and you can go deeper into something.

Interviewer: Can you complete the following? "Good teaching is . . ."?

Barceló: Something that I try to do in class is not only talking about what we are learning but also to talk about philosophy, about the world, about the current status of education in Chile, which is an issue in recent years here. Our students often go on strike because of the current status of education in the country, so they are very politically active. So, we tend to think and talk about these things. I think that this is part of teaching, and bad teaching is not considering these things in the equation.

Interviewer: So, we get to a more general question that we already partially encountered before. What is the main task of university education?

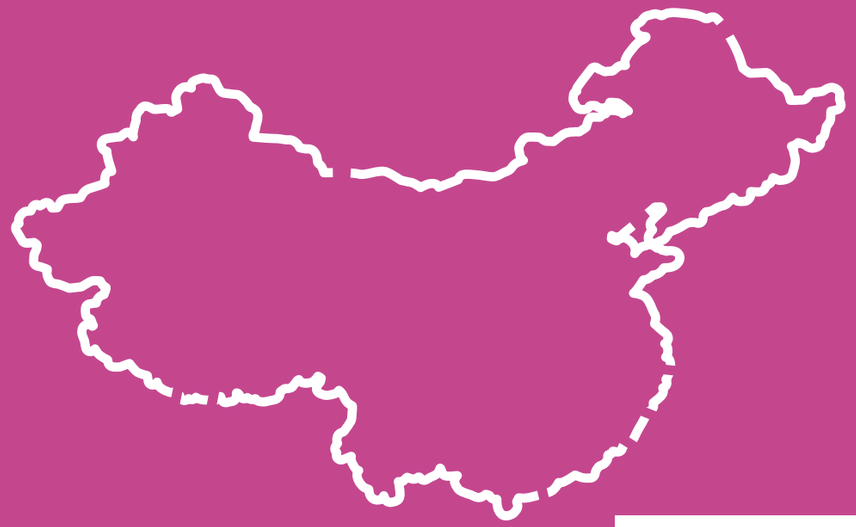
Barceló: Uhh . . . to form . . . citizens – people who care about the needs of their society. And who are very well prepared to do their job. People who think critically.

Interviewer: Yeah, so for you it's not only teaching computer science but also seeing the bigger picture?

Barceló: Of course, I mean otherwise it'd be so boring, no?

Interviewer: Do you have any advice for beginners in teaching?

Barceló: Be extremely well-prepared, go over all details, don't leave any detail unattended [laughs]. Here, I'm talking about technical details, especially for people who teach theory, it's so important. If you don't understand all the details, then you don't understand.



CHINA

Higher education in China is comparably centralized and primarily governed by the Ministry of Education and further provincial authorities. In the last decades, China made efforts to decentralize education, as private institutions were founded, for example. However, the majority of higher education institutions are owned by the state. The Gaokao—the national higher education entrance examination—serves as qualification for tertiary education. At the universities, the regional origin of a student is additionally taken into account. Most studies are organised in consecutive cycles, but there are also one-cycle vocational programmes. There are Bachelor, Master, and PhD equivalents with varying program durations, depending on the subject (Ministry of Education of the People's Republic of China 2017).

The gross domestic expenditure on research and development is 2%, and only 7% is invested in the higher education sector (UNESCO Institute for Statistics 2017). Studying in China does require the payment of tuition fees, which vary regionally and dependent on the student's origin. Loans, scholarships, and grants are available for students with high achievements or who are from low-income families (Ministry of Education of the People's Republic of China 2017).

The gross enrolment ratio in tertiary education is 43% with a slightly higher proportion of females (47%) than males (40%) enrolled. About one quarter does graduate with first degrees in ISCED level 6 and 7 equivalents in comparison to the age cohort. Here, the gender balance is comparable to the enrolment situation: 28% of females and 23% of males graduate in comparison to the age population. The enrolment ratio increased a lot in the past years (UNESCO Institute for Statistics 2017). There are 879 regular colleges and universities, 1266 junior colleges, and 287 independent colleges in China (Ministry of Education of the People's Republic of China 2017). Four Chinese universities are listed in the top 200 in the Times Higher Education ranking. The Xi'an Jiaotong University ranks in the 501+ positions (Times Higher Education 2016).

In full-time equivalents, 62% of all researchers are employed in business enterprises, 19% in government, and only 19% in higher education (UNESCO Institute for Statistics 2017).

China		Year
Gross domestic expenditure on research and development as percentage of GDP	2.05%	2014
Gross domestic expenditure on research and development by higher education sector	6.90%	2014
Gross enrolment ratio in tertiary education	43.39%	2015
Gross graduation ratio (ISCED 6 and 7, first degrees)	25.71%	2015

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DU GUANGQUING

Interviewer: Bilal Gökce

Position: Associate Professor

Institution / Country: Xi'an Jiaotong University, China

Subject: Electronic Science and Technology

Teaching time: 3 years

Teaching load: 4 hours per week

Interviewer: Our interview is about teaching, its significance, and its status in China. You became an associate professor – was teaching relevant for this promotion?

Du: Teaching students is very important, but the research work requires a lot of time for researchers. So for me, I put most of my energy, most of my time, into my research work. For teaching, I typically use two days to prepare for a lecture, and the other three days I do research work. This is the time distribution of my daily life.

Interviewer: Would you like to do more teaching and less research if you had the option? I know it's not an option now, research is more important everywhere, but would you prefer to be able to do more teaching?

Du: I want to do more teaching, this is my wish, but the real situation is that I must do research work in order to get funding.

Interviewer: When it's time to get promoted, do they look at your teaching skills? Do, for instance, students grade you? Do they evaluate you?

Du: Our university will give out some evaluation forms that the students will fill out. If my score would be very bad, I would be fired. For someone who wants to be promoted to associate professor, the teaching evaluation is very important. This is a very important condition to be promoted. If this is not OK, then there will be no promotion.

Interviewer: Is there money to improve one's teaching? If you want to make your lecture better with more demonstrations, do you get support for this or is it limited?

Du: In our university we have a special center for this purpose. This organisation helps a new teacher to do something that can be supported, such as with money, funding. If we want to improve the books, if we want to rent new books, we can get the money, the funding. This organisation can help me to do something, to support us to do something. It's called the Teacher Development Center, mostly for teaching newcomers.

CITATIONS

I want to do more teaching, this is my wish, but the real situation is that I must do research work in order to get funding.

I love teaching. This is my career; this is my work.

Interviewer: Let's talk about your students. How do you motivate them?

Du: It's a very important thing for classes to motivate the students and to gather their interest. For instance, when I taught an optics course, I used real time applications such as cameras, telescopes, or projectors to show the students why my course is important. I tell them that this course is very important for daily life, this is the first point, and it's really important for you to get a job maybe [both laugh] after they've graduated. So the students will get some interesting information for their near future, after graduation. This is important to get motivated students.

Interviewer: How about new ideas for lectures? Where do you check, if you want to add new things to your teaching, to your slides, for instance?

Du: The most important source of my teaching slides is the textbook. Also, we'll get some other supplementary sources from the website, from the sources in our library, which has some books and has some literature to help to enhance the quality of the slides.

Interviewer: Do you use videos from the internet?

Du: Yeah, almost always I will use a video to demonstrate something for the students.

Interviewer: How do you deal with students that talk a lot in the courses?

Du: Yes, in some very bad situations we will say 'go out' and 'don't be a bad influence to others', I guess. They are very harsh to do this, but in some very bad situations I must do this. [both laugh] Discipline is very important.

Interviewer: When you have students behaving in this way, don't you ask yourself why you teach? In one sentence, why do you teach?

Du: Because I love teaching. This is my career; this is my work.

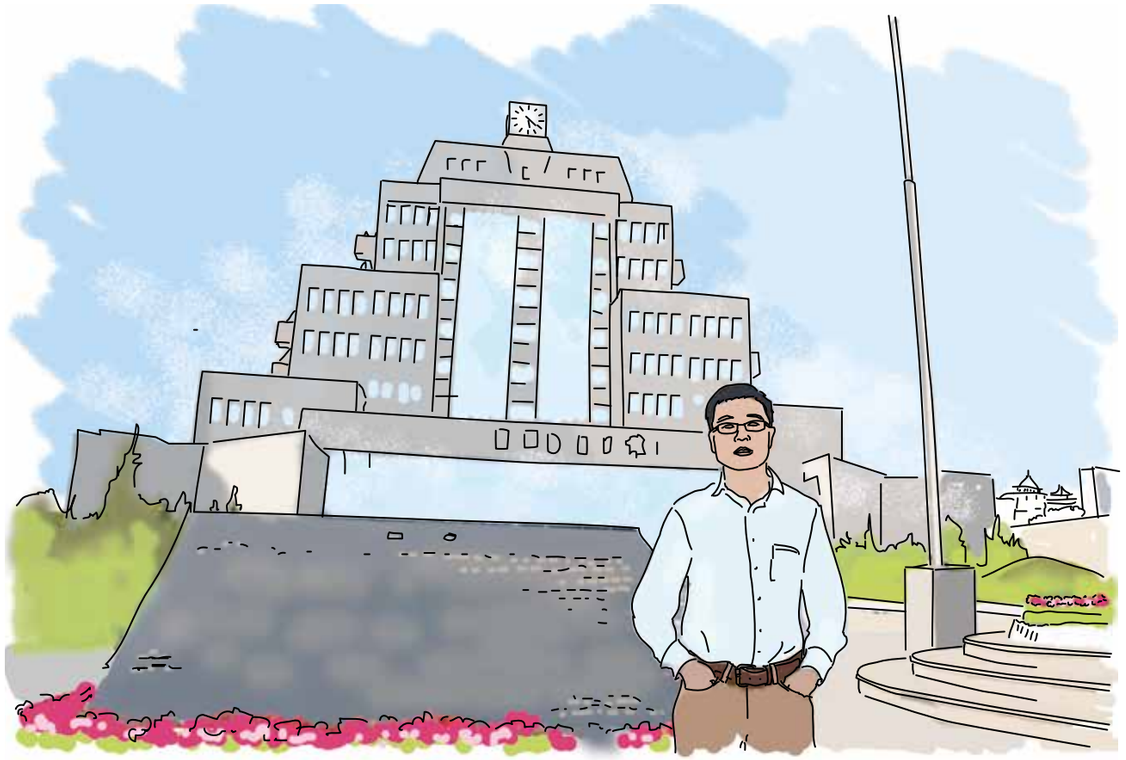
Interviewer: That's a nice answer. Not every professor likes teaching.

Du: Yeah, not everyone. At the beginning, I didn't like it as well, but when I realized that the students understood the knowledge I was trying to teach them, I was happy and I was satisfied. Since then I love my work, my teaching.

Interviewer: That's how a teacher should be [both laugh]. If you are going to teaching a course maybe for the tenth time, how do you keep your enthusiasm?

Du: The answer is that you must love teaching. If you love it, you can put your energy into this work and can be motivated all the time.

Interviewer: Thank you for your time!



HOW DO YOU MOTIVATE YOUR STUDENTS?

Muheim: I try to have the lectures given as interactively as possible, which is always a little bit difficult for undergraduates, because then you can only say half of what you are supposed to say.

Barcelo: By being myself and trying to show that I like what I'm teaching. For this you have to be extremely well-prepared. If they have this feeling, even if you fail, they will kind of appreciate it more.

Peres: There are many different groups, and the dynamics are always different, so I cannot say there is one thing that always works for everybody. But I don't give any frontal classes, I try to make many exercises where they have to find the solutions and talk about the solutions that they have found.

Deressa: I bring in some motivational speakers, a variety of videos. I also provide them with up-to-date journals. There are also some competitions, at the national level, in which I encourage them to take part; that keeps them very motivated. I really look for those who are excelling, I want them to excel as well and succeed.

Bojańczyk: I don't think I do. No, I don't have any specific strategies for that. I guess that the students are motivated on their own.

Jaalouk: For freshman, I pick a topic that is now hot in the news . . . and then you tell them, for you to understand this you have to follow me in class and understand the basics of biology.

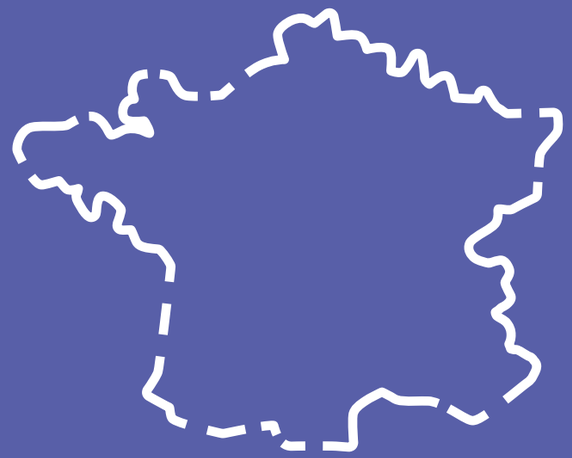
Aldridge: I think some students respond better to the carrot and others to the stick. One of the things I've found, the way I run small group tutorials is to get students up to the board and to reduce the amount of talking that I'm doing and increase the amount of talking that they're doing. They don't want to look like an idiot in front of their peers, and you can use that 'peer-pressure'. If you get some good students, it drags the rest of the cohort up. The dynamic within the group is actually quite important.

Hackländer: I try to convince them that the things they do here at university are the best things in their lives. They are here voluntarily, so it's not obligatory like in school, and so I expect that they really want this stuff. Also, the first thing that I always tell them is that they should always be very critical towards me, like they should be critical towards books or papers. The things we tell them might be true, but maybe they're not true.

Lindner: I like to give some independence to the students, . . . so that they can put their stamp on the teaching. [Or] with some concrete examples, citing problems from industry or letting them have some industrial context, so that they can connect what they hear in the course with real life.

Banerjee: When I am teaching some particular issue or chemical reaction, I try to tell some other interesting stories related to this discovery, or the first time somebody reported it, what was the importance of it.

Lange: In lectures, I try to have some interactive stuff in there. Either I play a little sketch, or sometimes I also have something where I need volunteers. That just kind of opens it up and makes it more interactive.



FRANCE

France is an EU country and belongs to the European Higher Education Area. It, for example, participates in the Bologna process and the ERASMUS+ program. The French education system is centralized to a great extent. The Department for National Education, Higher Education and Research governs, regulates, and funds all educational stages, while local authorities or the institutions' autonomy have a rather minor role.

By successful completion of upper secondary education, students receive the Baccalauréat, which is the required entrance certificate for tertiary education. For many forms of first cycle studies, further competitive selection examinations have to be absolved. The higher education programmes comprise different sorts of short-cycle studies: the Sections de Techniciens Supérieurs—which typically takes two years—and the Diplôme Universitaire Technologique at Instituts Universitaires de Technologie, which typically takes two to three years (ISCED level 5), as well as a wide range of further programmes. Most of these are structured into the consecutive three stages of Bachelor, Master, and doctorate programs, which conform to the Bologna conventions. Both Bachelor and Master studies typically take two to three years and can be absolved at Universités, Grandes Écoles, and further higher education institutions (EURYDICE 2017).

In comparison to Germany, the expenditure per student in tertiary education is, with less than 14,000 PPP$, rather low. The gross domestic expenditure on research and development is 2.3% of France's GDP, and one-fifth of this expenditure concerns the sector of higher education (UNESCO Institute for Statistics 2017). There are fixed general fees, which are lower for short and first cycle than for second-cycle studies. Additional institution-specific tuition fees vary, especially at Grandes Écoles and engineering schools extensively. Students who receive a need-based grant are exempted from paying fees. There are loans, tax reliefs, and family allowances to support studying (European Commission/EACEA/EURYDICE 2016).

Almost two-thirds of the respective age group attend tertiary education institutions, while more than 70% of females, not even 60% of males are enrolled. The graduation ratio of Bachelor and Master first degrees is below 50% in total, but higher than 50% for females (UNESCO Institute for Statistics 2017).

There are 83 public and five private (confessional) universities, as well as about 250 Grandes Écoles (e.g., schools of engineering). Fourteen of these Grandes Écoles are located outside France. Four of the universities are ranked in the top 200 list of the Times Higher Education Ranking. The Unviersité Paris Diderot does not belong to these, but reached the rank 199 in the previous 2015-16 list (Times Higher Education 2016).

Almost one-third of all researchers work in the sector of higher education, but most are employed by business enterprises. Only few researchers are employed by the government or private non-profit organizations. Only about one out of four researchers is female (UNESCO Institute for Statistics 2017).

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France		Year
Expenditure per student in tertiary education	13, 732 PPP$	2013
Gross domestic expenditure on research and development as percentage of GDP	2.25%	2014
Gross domestic expenditure on research and development by higher education sector	20.59%	2014
Gross enrolment ratio in tertiary education	64.39%	2014
Gross graduation ratio (ISCED 6 and 7, first degrees)	45.92%	2014

ANKE LINDNER

Interviewer: Julia Nase

Position: Professor

Institution / Country: Physics department ESPCI and Université Paris Diderot, France

Subject: Physics

Teaching time: Since 2002

Teaching load: 192 hours / year

Teaching Bachelor / Master / Graduates: Mainly Master, some Bachelor

Interviewer: What is the ratio of students to lecturers at your department?

Lindner: In my lab, which is somewhat like a small department in Germany, maybe we have like half-and-half students and permanent researchers.

Interviewer: Are you happy with the status and prestige of teaching in your country, and why?

Lindner: I'm not sure if teaching has a lot of prestige in my country. It's something that all professors do, but it's often seen as a duty, I would say. And also France has a system where positions without teaching exist at the CNRS, and, in general, these are the more prestigious positions.

Interviewer: Do you feel supported in your role as an academic teacher?

Lindner: I think we are mainly supported on a private level. I have support from a lot of colleagues who are very willing to help, but I don't really see where the support is, from an administrative or institutional point of view.

Interviewer: How important is, or was, good teaching for your professional career?

Lindner: If you want to have an internal promotion, your commitment to teaching is important. I think this is the only moment in which teaching is evaluated, but, in general, teaching is not very important for a professional career.

Interviewer: OK. Students expect that you are well prepared and are open for questions. Conversely, what do you expect from your students?

Lindner: When they come to class, they should want to listen to what I teach. If they are not interested, I would prefer that they not attend class. I think that the effect of being active and taking part in what happens is what I would expect from my students.

Interviewer: How do you motivate your students?

Lindner: I like to give some independence to the students so that they can put their stamp on the teaching. Or, to mention a specific example, often I try to cite problems from industry or to let them have some industrial context, so that they can connect what they hear in the course with real life. That's quite a good motivation.

Interviewer: Can you answer in one sentence: Why do you teach?

Lindner: I think there are two reasons. First of all, I like the contact with students, I like the discussion, I like knowing what they do, what they are interested in. And maybe on the Master's level, I like communicating the things I work on, or to discuss the topics I spend my time on with the students.

CITATIONS

I'm not sure if teaching has a lot of prestige in my country. It's something that all professors do, but it's often seen as a duty, I would say.

Even if it's not always easy to implement, I think the more interactive you can be, the more effective it is.

I think a really good course is one in which you can feel the personality of the person that is teaching the course.

Interviewer: Isn't it boring to say the same things over and over again? How do you keep your enthusiasm?

Lindner: Actually, we normally change the courses we do after four or five years. So, I would say there's something like a 'life-cycle' of a course. The first one, two, three years you are still improving yourself, and then somehow you get bored.

Interviewer: This is a more philosophical question, I guess – why does teaching increase happiness?

Lindner: I'm not completely sure it does!

Interviewer: Can you describe the influence or role of the internet on your teaching?

Lindner: Actually, it's not very important for the courses I've taught. I think it is mainly important as a source of information and research for the students. For example, if we assign small projects, then it's the role of the student to search for things on the internet, but I haven't really taught something that is really web-based.

Interviewer: Which type or technique of teaching is most effective, and which technique do you use most?

Lindner: Even if it's not always easy to implement, I think the more interactive you can be, the more effective it is. I think just standing at the blackboard and just talking for three hours is very difficult for the students to follow, so I think if they can either participate during the course, or if they can do things on their own at home and then bring it back and it can be discussed, is much more effective.

Interviewer: So "good teaching" is?

Lindner: I think a really good course is one in which you can feel the personality of the person that is teaching the course. Of course, the person also needs to be well prepared and to have some talent in presenting things in such a way that the students can understand them. It might be good to give them some interest and motivation to continue with the topic maybe a bit further than what is taught in the course.

Interviewer: And "bad teaching" is?

Lindner: Being chaotic, not prepared, doing something that is not at all on the level of the student, just keeping to your book, not considering the interest of the student.

Interviewer: In your opinion, what is the main task of university education?

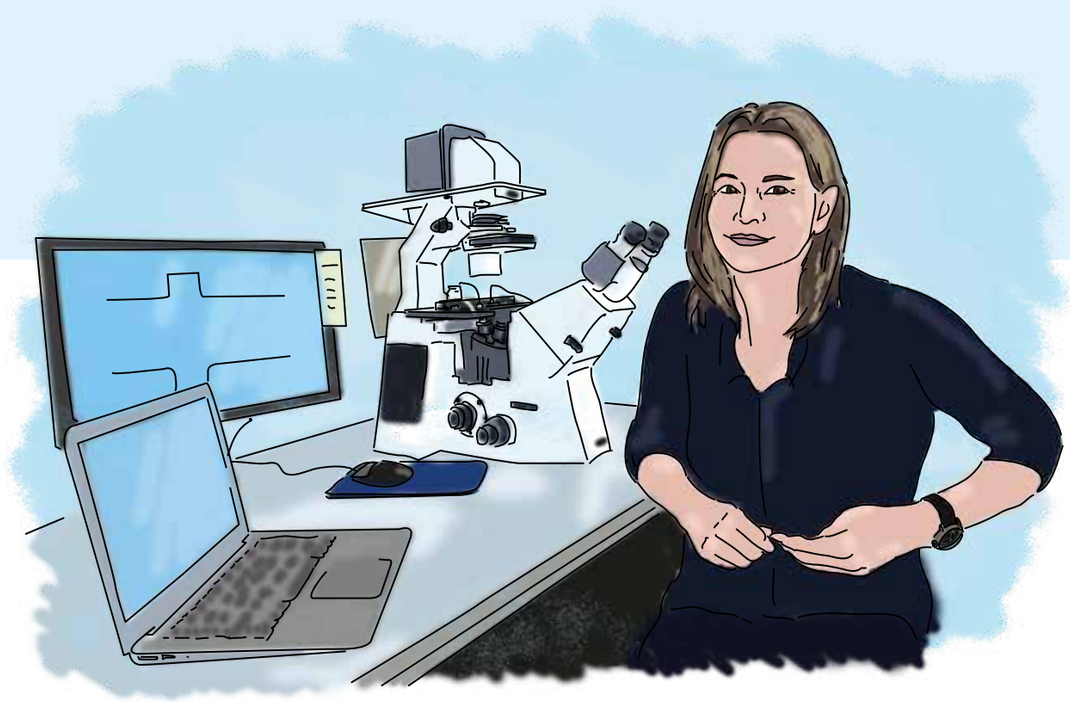
Lindner: It is to form people that can think independently, that can solve problems, that can use information and do something with it. So I think that's something very general you can learn at university, regardless of the topic that is being taught. Then, of course, we give them knowledge in the given domain of their studies.

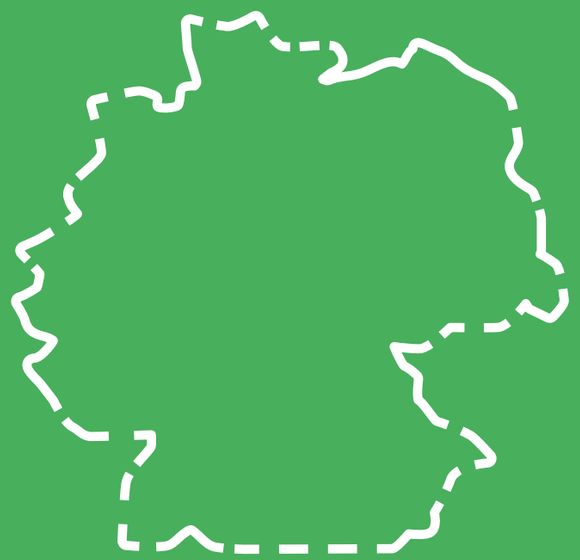
Interviewer: Where do you see teaching at university level in 20-30 years?

Lindner: There's a lot of things changing right now with e-learning, and there are great courses that you can look up on webpages. I think teaching will need to evolve quite a bit, because right now we deliver content. That's something that I think, with time, will be quite easy to find somewhere on the internet. Then maybe we need to teach something different – how do I cope with the content on the internet? What do I do with it? How can I structure it? So I don't know exactly how it will be, but I think that it needs to be quite different from where it is now.

Interviewer: Do you have an advice for beginners in teaching?

Lindner: I think it's very easy to be eaten up by your teaching, because if you want to be perfect, you can spend all your time preparing for the teaching. So I think you need to find a good balance where you take it seriously, you prepare it well, but then also at some point you stop.





GERMANY

As an EU country, Germany belongs to the European Higher Education Area and, for example, participates in the Bologna process and the ERASMUS+ program. Legislation rights concerning the sector of (higher) education lie almost exclusively within the sixteen Länder (federal states). Here, diverse ministries are responsible for organizing, regulating, and funding almost all aspects of education. On the level of the federal republic, regulatory guidelines are specified.

However, across the states, students typically finish upper secondary education when they are 18-19 years old. With successful completion of upper secondary, they receive either the Abitur (general qualification for university entrance) or the Fachabitur (diploma that only qualifies for specific studies). Depending on the specific institution and study subject, the students need to have a specific numerus clausus or have to participate in entrance examinations (e.g., at art colleges).

The spectrum of German higher education institutions is rather large: there are Universitäten (universities), Fachhochschulen (colleges of applied sciences), Kunst- and Musikhochschulen (colleges of art and music), and different further higher education institutions. Among these, there are specified universities like Technische Hochschulen (technical universities), specified further higher education institutions (e.g., Verwaltungshochschulen), as well as Länder-specific institutions like Berufsakademien (professional academies). A minority of these are private institutions. There are no short-cycle (ISCED level 5), but Bachelor and Master programme equivalents (ISCED levels 6 and 7). ISCED level 6 programs at Universitäten and Fachhochschulen typically take three years, while they might take four years at Kunst- and Musikhochschulen. ISCED level 7 programmes usually take two years. Apart from the Bologna-conform degrees, there is for example the Diplom (diploma) or Staatsprüfung (e.g., in law studies) (EURYDICE 2017).

The government expenditure per student in tertiary education is ca. 17,000 PPP$. The gross domestic expenditure on research and development is 2.87% of Germany's GDP, while about two-thirds of this is allocated to the sector of business enterprises. The sector of higher education captures about 17% and the government 15% (UNESCO Institute for Statistics 2017). In none of the Länder are tuition fees charged at public higher education institutions; neither for students from inside or outside of Germany. In ten Länder, there are low administrative fees charged. The need-based general public student support program (BAföG) supports first- and second-cycle students. Typically, one half of this sum of money is a grant and the other a loan. There are further possible loans (Bildungskredit), as well as family allowances. Additionally, students can apply for different stipends (European Commission/EACEA/EURYDICE 2016).

The gross enrolment ratio of the tertiary school-age population is almost 70% with almost balanced gender rates: A slightly higher proportion of males (70%) than females (67%) is enrolled. In terms of the graduation ratio, this picture changes: 44% of females and 40% of males graduate (UNESCO Institute for Statistics 2017). In Germany, there are overall 426 higher education institutions with Fachhochschulen and Universitäten representing the majority. In the Times Higher Education ranking, 22 German institutions are ranked among the top 200. The University of Duisburg-Essen reaches the placement of 197 (Times Higher Education 2016).

Almost half of all researchers work in the sector of higher education, while the rest is employed by business enterprises (40%) and the government (12%). Only 23% of them were female in 2013 (UNESCO Institute for Statistics 2017).

Germany		Year
Expenditure per student in tertiary education	17,093 PPP$	2013
Gross domestic expenditure on research and development as percentage of GDP	2.87%	2014
Gross domestic expenditure on research and development by higher education sector	17.14%	2014
Gross enrolment ratio in tertiary education	68.27%	2015
Gross graduation ratio (ISCED 6 and 7, first degrees)	42.08%	2014

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Isa Steinmann & Rolf Strietholt

SULAMITH FRERICH

Interviewer: Jochen Niemeyer

Position: Junior Professor

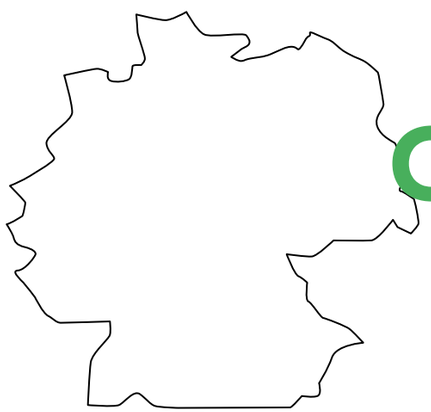
Institution / Country: Ruhr University Bochum, Germany

Subject: Didactics and teaching in mechanical engineering

Teaching time: Since 2013

Teaching load: 9 hours per week

Teaching Bachelor / Master / Graduates: Bachelor, Master post-graduates



GERMANY

Interviewer: You are teaching teachers in mechanical engineering. Do you think that it really matters whether you do good or bad teaching at the university level?

Frerich: I think there is a real need to be a good teacher and to address teaching principles for all students. For the students, who are going to be teachers themselves in the future, it's essential that they know what they are doing. But also for all other students of mechanical engineering it's important, because they will have to address different groups of people with no background in engineering. Many of them are going to be working on interdisciplinary teams

Interviewer: What do you expect from the students?

Frerich: I expect and hope that the students are open to my ideas. I don't want them to be little computers just repeating stuff that I did beforehand and not thinking about what is happening. I want them to be engaged in small-group discussions and then share their opinions as a group with me and with everyone else, and I want to see that they are trying to understand what I am trying to tell them.

CITATIONS

It should not be regarded with disrespect if someone starting new is searching for help.

Teachers should try to stay true to themselves, not try to adapt to something that they are not really comfortable with.

I like to explain something and then seeing, "Ah, I understand!"

So if I am engaged in doing the teaching job, I want them to be engaged in doing the listening, understanding, transferring job.

Interviewer: How do you achieve this? How do you engage or motivate your students? Are there any techniques or special things that you use to do this?

Frerich: I try to be transparent about the goals that I am trying to achieve with them, not only being transparent with what is important for the exam at the end, but also being transparent about the task every single session that we share. I often ask them to discuss material and solve tasks in small groups.

Interviewer: Let us come to your personal motivation. Why do you teach or why do you like teaching?

Frerich: I like seeing the process of understanding illuminated. I like to explain something and then see, 'Ah, I understand!' So this is what fuels me and what is still interesting to me after all these years.

Interviewer: But isn't it boring to teach the same course every year? Or how do you keep yourself motivated to teach the same things again and again?

Frerich: I guess the interesting part is really to check how the audience is changing, because maybe the facts or the methods – whatever it is that you are going to tell people – they are the same, or they are maybe just a little bit moderated. But the people sitting there are responding to these facts differently.

Interviewer: So is there any special way in which you get new ideas for your teaching?

Frerich: Well for me, there's still a lot to find in books. But maybe even more important is the exchange with other teachers, to see how they are doing things and how they are solving problems.

Interviewer: OK, so do you use the internet for teaching? Like e-classrooms or questions that you put online or something like that?

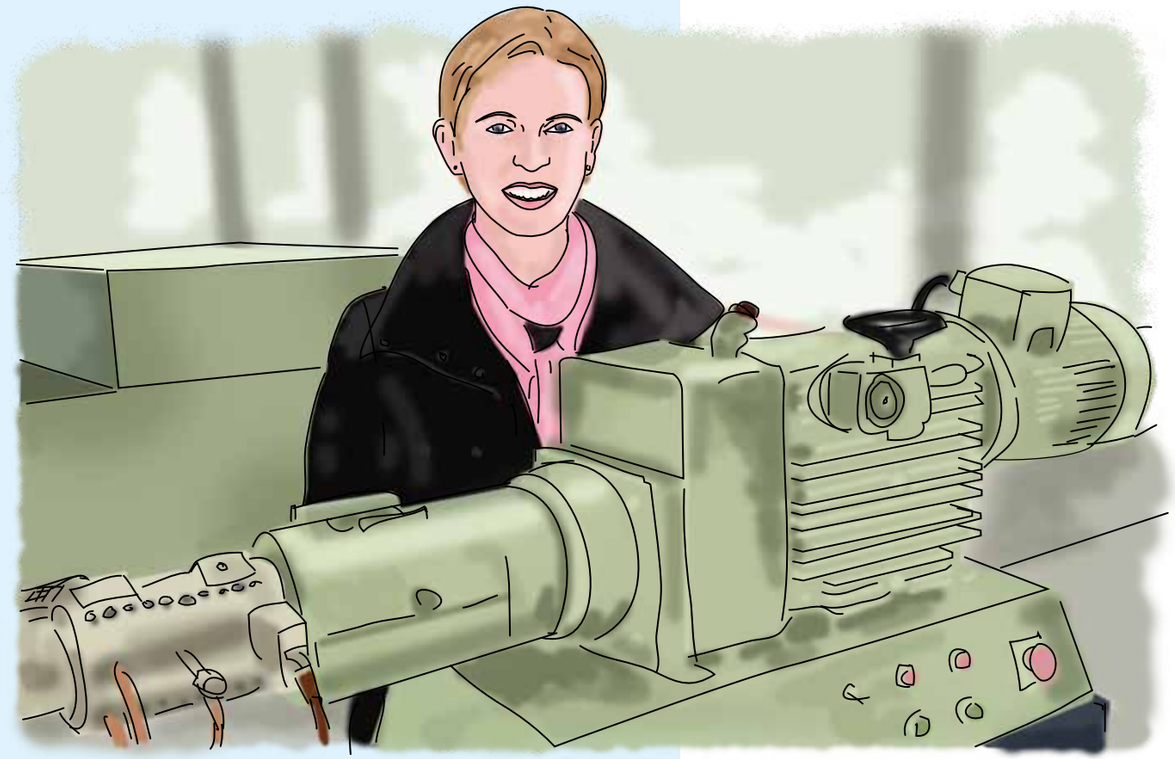
Frerich: I am using, for example, Blackboard and Moodle. In addition, I use a virtual online platform, a remote laboratory, to engage students in practical experiences. They can sit at home and press buttons, and something is happening in a real lab and the students then get a movie about this.

Interviewer: That's interesting. Can you explain this in a little more detail?

Frerich: So, it's like a remote for your TV. You start from the couch at home, but for these laboratories we have a real environment. Of course, we ensure that the lab is closed off so that nobody can actually be hit by a robot arm or something else. For the student at home it is also not possible to crush the experimental setup. But still, they can run the experiment as if they are somehow standing next to it. It is really a tele-operated laboratory.

Interviewer: What's the reason for doing it this way and not just send the students to the lab?

Frerich: Especially for the engineering sciences, all labs should be used by every student. However, with increasing numbers, we cannot afford to take all students into each lab – this costs too much effort and time. We also have intermediate forms where we are trying to combine the advantages of remote laboratories and with hands-on laboratories.



Interviewer: As a final question, do you have any advice for a beginner in teaching, so someone who has their first lecture next week?

Frerich: It should not be regarded with disrespect if someone starting new is searching for help, maybe even from the beginning, or looking for advice from somebody who has been in this job for quite some time. Teachers should try to stay true to themselves, not try to adapt to something that they are not really comfortable with. It is not helpful if somebody who doesn't even have a smartphone at home is trying to use the most advanced technology in teaching.

GLAUCIA PERES

Position: Post-Doc Sociologist

Institution / Country: University of Duisburg-Essen, Germany

Subject: Sociology

Teaching time: 3 years

Teaching load: 4 hours per week

Teaching Bachelor / Master / Graduates: Bachelor, Master

Interviewer: Jochen Niemeyer

GERMANY

Interviewer: Are you happy with the recognition or the prestige of teaching in the current university system?

Peres: I think . . . I am not happy [both laugh]. I think it is a very important part of university life, and people just mix that up and say, no, universities are for research and students are there just as a matter of fact because they have to be there. I don't agree with this position. I think we have to work harder to form better students or better researchers or better professionals, in whichever area we are, because for us it's very complex. Sociology is not a profession, in the strict sense. Afterwards, you don't have very clear jobs that sociologists are going to do. Of course, in market research, in some areas it's already clear, but maybe sociologists can do other things. So I think we have to be bright enough to prepare people to sell themselves in the workforce in very different areas.

Interviewer: What do you think is the significance of teaching?

Peres: I think it's our role in forming, rather than selecting students. They have to think, to learn to be independent in thought and discussion, and to search for the information they need.

Interviewer: How do you see the situation concerning the teaching generally in Germany?

Peres: I think the professors here have a very high teaching load in comparison to everything they have to do. They don't have time to think about it. In my case, I feel comfortable with my three courses, it's enough. It works well with balancing research and other things. But I think for the professors it is too much. They have up to five courses. We don't have enough teachers to cover the seminars so we have to hire so-called "Lehrbeauftragte" [external lecturer], and that's an additional problem because we don't have continuity. With the outsourcing of teaching, we don't have control and as a consequence the students are sometimes a little bit disorientated.

Interviewer: How do you choose the Lehrbeauftragte?

Peres: Previously, they were former PhD students, so they were just teaching here for experience. But now the situation is that we have a new kind of law, and we cannot hire, for example, people who have already taught here for some years, because the work is characterised as a continued activity that the university needs, so this person can sue the university for a job. To avoid this kind of problem we need to look for new people again every semester, or every second semester, which is not good.

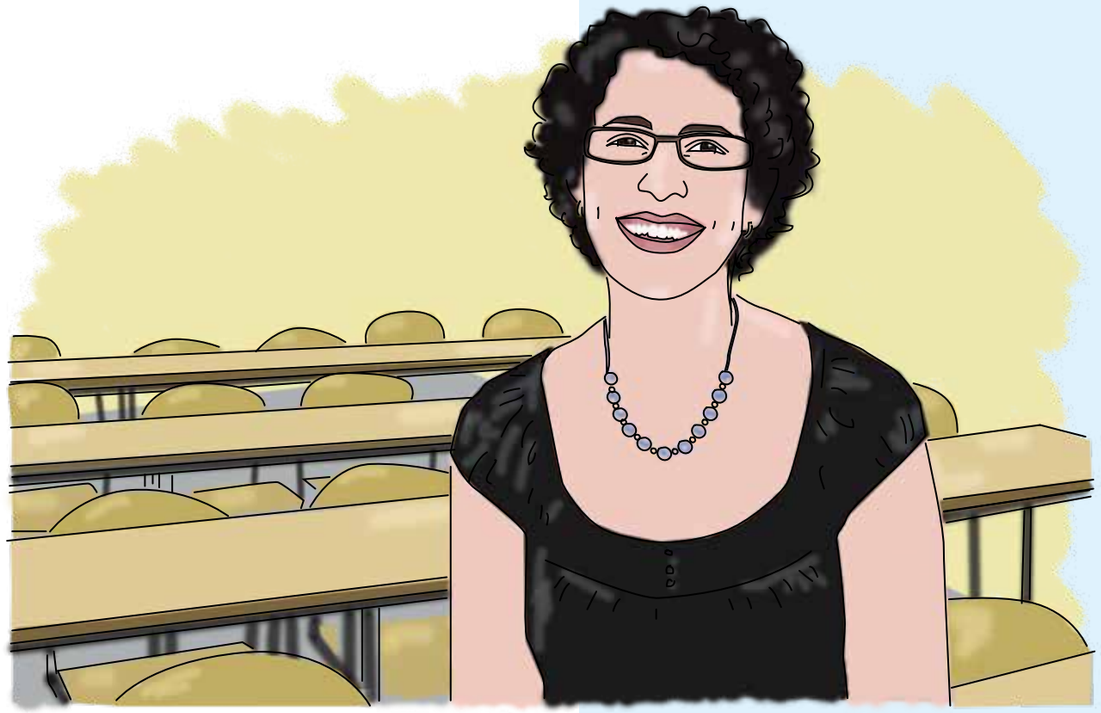
Interviewer: So going from the general picture to yourself, do you feel supported as a teacher?

Peres: Yes, yes.

CITATIONS

So I think we have to be bright enough to prepare people to sell themselves in the workforce in very different areas.

I think this kind of informal atmosphere that is created in class, that was the good part.



Interviewer: How do you get new ideas or inspiration for teaching?

Peres: I talk to my peers a lot, and we had a group in this ZfH (Zentrum für Hochschul- und Qualitätsentwicklung) – the people that did the NRW (North Rhine-Westphalia, Germany) teaching certificate with me – we are three people who talk a lot with each other, when we have certain questions, like 'OK, it's not working, how do you do this?' And I think I try to hear the feedback from the students from last semester, what didn't work, what is good, but now I just use my creativity. I don't have a special place, but sometimes I read a text and think, 'Ah, it would be great to do that with them!'

Interviewer: What type of teaching do you think is most effective?

Peres: I would say that we have to feel comfortable in doing the things we do. In my case, I don't have anything against blackboards, but I am not a native speaker. So when I arrived, I would make so many mistakes, it would be more difficult for the students to understand what I meant than if I prepared it in advance, so I use PowerPoint. But I really think that discussion classes are much better than frontal [lecture] classes.

Interviewer: You did win a prize for your teaching, was it from the university? Was that for one of your courses?

Peres: No, it was a surprise. The students nominated me, and they justify why they are doing so. And then I received a letter from our Dean's Office telling me that I had to hand in some documents in support of my nomination, so I was surprised. I read what the students wrote in this document. Actually they nominated me because of my way of dealing with them. They say that we see eye-to-eye; for example, I speak to the students with the informal German form. It's difficult for me to do otherwise, because in Brazil we are very informal, we address professors by first name, so it's difficult for me to look at them and say, 'Mr So-and-so' when he is 18 years old. So I think this kind of informal atmosphere that is created in classes, that was the good part. They found it respectful, and also that I was supportive, I was helping all of them, and this kind of thing. It was more . . . something that I cannot describe as a trick that everybody can replicate somewhere else.

Interviewer: Do you have any special story or moment that you had during your teaching that you think is worth telling?

Peres: I would say that because I am a migrant, migrant students come to talk to me about problems that they have with the Germans, for example. It happened twice already, or that they feel free to come to me – for example, this week I had a personal problem, and then a first semester student came to me and usually they are very funny in this class and we laugh a lot. She came to me and said, 'Frau Peres, this week you are not as happy as last week', so this kind of thing happens. They feel free to come to talk to me.

Interviewer: So why do we do university education? What's our task here?

Peres: I think it's forming people and citizens. In a broad sense.

Interviewer: And where do you see university teaching in 20-30 years? Do you think it will be very different, or similar to today?

Peres: I hope it will be very different, because I think new generations use technology in a different way. They have a different view of things, and I think that university has to change a lot. Sometimes I have the feeling that we are in this industrial era where we have time to begin, time to end. This kind of workload fits that industrial thinking, so I think we can change a lot and I hope it changes.

WHY DO YOU TEACH? (IN ONE SENTENCE)

Vernekohl: Because I learn a lot.

Bojańczyk: Because I like to share knowledge.

Barceló: Because I want to learn.

Muheim: I like it, because you can interact with students and get to know the new generation of potential scientists of the future.

Deressa: You know, teaching gives you greater pleasure and satisfaction, moulding someone and making them acquire knowledge in life is the biggest reward you can get.

Du: Because I love teaching, this is my career, this is my work.

Painter: What I enjoy about the teaching is the interaction with students; and for me it's a learning experience as well, so I really like going in, learning material, and then explaining it to others.

Jaalouk: It helps me in my research, whether I like to admit it or not.

Peres: One sentence. . . I think it's important.

Phillips: I mainly teach for selfish reasons . . . I [teach to] keep up with the literature; my science is better because I teach.

Hackländer: I like to see the growth of knowledge and understanding in young people.

Lindner: I think there are two reasons: first of all, I really like the contact with students, I like the discussion, I like knowing what they do, what they are interested in, and also especially, and maybe on the Master's level, I like communicating the things I work on, or the topics I spend my time with, to the students.

Anderson: I really love working with hardworking C-average students and turning them into A-students, so folks that are maybe not academic superstars, but have a really good work ethic.

Frerich: I like seeing the process of understanding illuminated. I like to explain something and then seeing, 'Ah, I understand!', so this is what fuels me and what is still interesting to me after all these years.

Lange: I guess because I enjoy telling young people about the things that I like, about my hobbies or about my work, about the things that fascinate me. That's the basic motive, I guess.

Krans: To share my enthusiasm for the topic.

INDIA

In India, the Department for Higher Education is the legislative authority in the sector of higher education. The University Grants Commission is an umbrella authority in accreditation, funding, and supervision of tertiary education. As in other countries, the union, the states, and local authorities are concerned with administration and government. Higher education institutions encompass Central Universities, which underlie a Central Act, State Universities, which underlie State or Provincial Acts, Private Universities, Deemed Universities, which underlie the University Grants Commission Act, and further university-level institutions. Tertiary education is primarily structured in consecutive cycles corresponding to the ISCED levels 6 (Bachelor), 7 (Master), and 8 (doctoral studies), with additional subject-specific degrees (Department of Higher Education 2017).

In comparison with Germany, the government expenditure per student in tertiary education (about 2,400 PPP$) is very low. However, the government spends 14% of its total expenditure on education in the primary, secondary, and tertiary sector. When looking at the gross domestic expenditure on research and development—which is lower than 1% of India's GDP—this appears to be quite low, too. Just 4% of it is spent in the sector of higher education (UNESCO Institute for Statistics 2017).

About one quarter of the tertiary school age population is enrolled in higher education, with females and males being almost equally represented. When looking at the graduation ratio, a slightly higher proportion of females (28%) in comparison to males (25%) are reported (UNESCO Institute for Statistics 2017). The number of universities increased extremely from 20 in 1950 to 677 in 2014 (Department of Higher Education 2017). No Indian higher education institution is ranked in the top 200 of the Times Higher Education ranking. The Indian Institute of Science in Bangalore scores the highest with a 201+ placement (Times Higher Education 2016).

In 2010, only 14% of all researchers were female. Most researchers are employed in business enterprises (39%) and the government sector (46%); only 11% work in the field of higher education. Further, 4% of researchers in full-time equivalents were employed in private non-profit organizations (UNESCO Institute for Statistics 2017).

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India		Year
Expenditure per student in tertiary education	2,419 PPP$	2013
Gross domestic expenditure on research and development as percentage of GDP	0.82%	2011
Gross domestic expenditure on research and development by higher education sector	4.06%	2011
Gross enrolment ratio in tertiary education	25.54%	2014
Gross graduation ratio (ISCED 6 and 7, first degrees)	26.43%	2014

SUPRATIM BANERJEE

Position: Assistant Professor

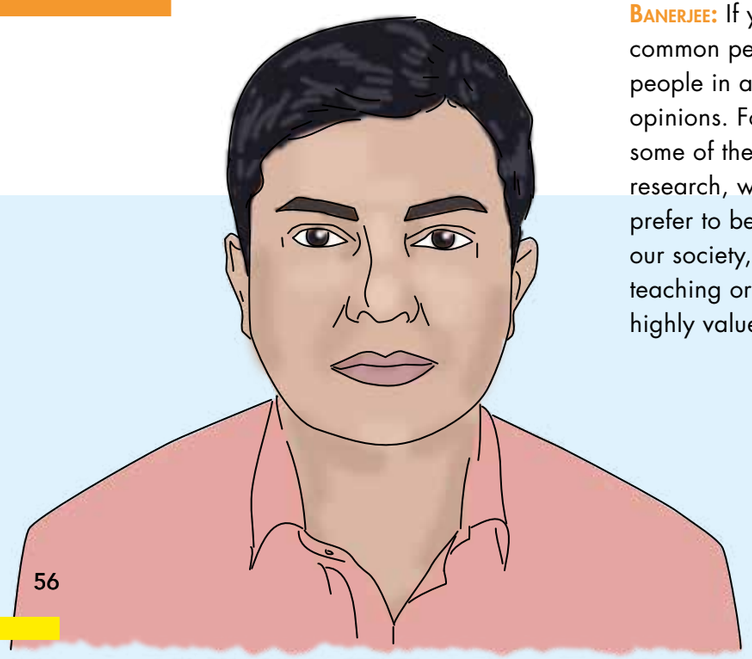
Institution / Country: IISER (Indian Institute of Science Education and Research), Calcutta

Subject: Chemistry

Teaching time: 1 year

Teaching load: 3 hours (currently), 12 hours (next term)

Interviewer: Jochen Niemeyer



Interviewer: How do you think the importance or prestige of teaching is for a university professor?

Banerjee: If you think about our society, common people value it a lot. However, people in academia do have different opinions. For example, among my colleagues, some of them like teaching as well as doing research, whereas some others probably prefer to be more involved in research. In our society, I feel in general, whether you do teaching or active research, they are taken as highly valued professions.

Interviewer: OK. So, on the other hand, what do you think is the significance of teaching for the scientific system?

Banerjee: I think it is important. Specifically for me, I believe I would always like to be involved in some kind of teaching. When you teach, it also gives you newer ways to think about something, which you probably learned a long time back. Also, by interacting with motivated students, you do learn many new things.

Interviewer: And do you feel supported as teacher? Do you get support from your university for your teaching activities?

Banerjee: We have a special academic cell in our Institute, and it takes care of our teaching related things. They also assist us in case we need any help with a presentation or conducting an exam. We also get feedback from students, which is periodically collected by the academic cell and discussed in the academic committee meetings. So, I guess we have a reasonably good system; we get feedback from the students as well as from the senior faculty members.

Interviewer: How do you do the student feedback?

Banerjee: After two months in a semester, we receive the first feedback (we call it 'Mid-Sem' feedback), We figure out those areas in which we did not do that well and need improvement. At the end of the semester, we receive the final feedback ('End-Sem' feedback) and then one can easily compare. So, it is basically two feedbacks in one semester.

CITATIONS

I have attended lectures of some of my colleagues who are known as good teachers.

I think you can't be the best teacher in your first year of teaching, but if you constantly try to improve, you will surely become a good teacher.

Interviewer: So, how important do you think good teaching is for your professional career?

Banerjee: I think that it is important, but it is also equally important that you maintain an active level of research. Typically when you do good teaching, you tend to attract a lot of motivated students, and that helps you to build and maintain an active research group. Another thing is that, in the institute, people do recognise and respect you as a good teacher. If you have done really well in terms of teaching, it is a good addition to your CV and this would also help in case you apply for a new academic position. But in the long run, I feel, the research is probably more important.

Interviewer: In a more general sense, talking not only about teaching but being a professor, is that a very reputable thing in India?

Banerjee: Yes, it is a highly-valued profession in India. However, it also depends on the Institute/University in which you are holding the position. For example, institutes like IISc, IITs, IISERs and IIMs (*) are well known throughout India, and being a faculty member in one of these institutes will probably be of slightly higher reputation compared to some other Institutes/Universities. (*IISc: Indian Institute of Science; IIT: Indian Institute of Technology; IISER: Indian Institute of Science Education and Research; IIM: Indian Institute of Management)

Interviewer: Regarding the students, of course students expect that you are well-prepared and are willing to answer questions. So what do you expect from the students, on the other hand?

Banerjee: I expect students to ask more questions. From my experience I can tell you that you will always find a few students in any class who typically interact more and ask questions. But I would like to have more involvement from students in this respect.

Interviewer: How do you motivate your students to keep listening or to prepare for their classes? Do you have any special tricks?

Banerjee: When I teach a particular topic (e.g., a chemical reaction), I generally discuss some interesting facts related to its discovery or first report and what was its importance, or something of that sort.

Interviewer: And does teaching increase your happiness? Or does it?

Banerjee: [laughs] If I think about it on a personal level, yes. When I explain a topic to students and if I can make them understand, it gives me a kind of satisfaction. Teaching in a class also provides an opportunity to focus on the finer details about a topic. It is not always possible to revisit the fundamental concepts while concentrating on a particular research topic, and this is one of the major advantages that one gains from teaching.

Interviewer: How do you get your ideas for teaching, for example, from books, from hearing other lecturers?

Banerjee: I have attended lectures of some of my colleagues who are known as good teachers. Everybody teaches in a slightly different manner and what I tried to do was to pick up a few things from their lectures. For example, how to keep the students interested for a 50 or 55 minutes class. What some of my senior colleagues do is that after probably half an hour or so, they talk about some general things and then come back to the topic again. So, I hope these things will be good additions to my teaching in the coming years.

Interviewer: So, what do you think is the most effective way of teaching, what technique do you use the most? The board, slides, or something else?

Banerjee: What I have observed so far is that the undergraduates prefer more board work. Slides are definitely good for showing schematic drawings or illustrations, but most of the students prefer board work.

Interviewer: One very open question: what is good teaching for you?

Banerjee: A good teacher must be able to present the concepts in a nice way and should make sure that the students are able to understand them. It is also important to encourage the students to solve problems based on the topics taught in the class.

Interviewer: OK, so last three questions. What do you think is the main task of university education?

Banerjee: I think both teaching and research are equally important. In my opinion, the universities in India should make the laboratory courses more interesting, especially at the Bachelor level.

Interviewer: So where do you see university teaching in 20-30 years?

Banerjee: I think it is gradually changing, especially with regard to what you call technological inputs or technological assistance in teaching. I guess this will probably go on, and we will have new and more innovative possibilities to make the teaching more interesting.

Interviewer: So do you have any advice for a beginner in teaching?

Banerjee: I think it is very important to understand the mentality of students. Sometimes, we may assume that they have understood well, but it may not be the case from their side. I also feel that you can't be the best teacher in your first year of teaching, but if you constantly try to improve, you will surely become a good teacher.

Interviewer: Thank you very much!

ISN'T IT BORING TO SAY THE SAME THINGS OVER AND OVER AGAIN? HOW DO YOU KEEP YOUR ENTHUSIASM?

Watanabe: Even though I taught the same content, the response from the students is different. Some of them used to ask me good questions, which were not easy for me to explain.

Muheim: Well, I always learn myself. Every time I have to redo the same lecture I usually try to find something new or update myself, and I think it also keeps me up to date and checked.

Barceló: Well, sometimes it can be, but I think that you can always find a way to go in different directions within the same topic.

Deressa: Teaching is my passion, absolutely my passion.

Du: The answer is that I must love my teaching work. If I love it, I love the teaching, I can put my energy into this work, I can be motivated all the time.

Painter: Science is an evolving field. It's my philosophy that if you're teaching the same thing today that you taught ten years ago, then you're not doing a good job.

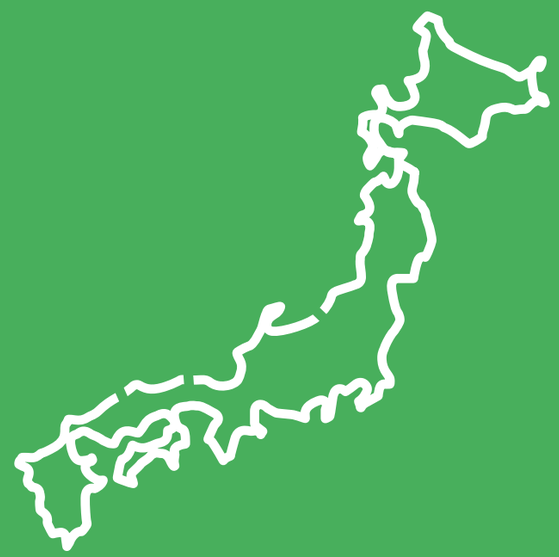
Aldridge: I think there are plusses and minuses to teaching the same material. Particularly with the more challenging things, you get better at doing that, because you learn the material a bit better and you know what the awkward questions will be. On the other hand, if you're teaching stuff that you take for granted, I think there is a potential to get more stale. In that respect, you need to just alter the material a little bit.

Hackländer: Well, the repetition is just for me, but there are always new students there, and it's always fun to see 'Aha, they do the same as last year'.

Lindner: Actually, we normally change the courses we do after four or five years. So I would say there's something like a 'life-cycle' of a course. The first one, two, three years you are still improving yourself, and then somehow you get bored.

Lange: Actually, in between two lectures, a lot of things happen, research-wise, so there's a lot of things that you can update your lectures with.

Krans: If I give the same lecture every year, then I try to update the lecture and see if there is new information on the topic, then it's interesting for me, too, because I learn as well.



JAPAN

Japan has a unique status in Asia, as the education system is modelled after Western standards and differs from other Asian countries and educational systems. The Higher Education Bureau is in authority of the policies regarding higher education. It is a governmental organization and part of the ministry of Education, Culture, Sports, Science, and Technology. Depending on the form of upper secondary education, one can afterwards enter universities, junior colleges, colleges of technology, or specialized training schools. These tertiary education institutions offer different courses and degrees, while only universities and junior colleges are considered as higher education in a strict sense. There are national universities, public universities, and private universities, which are most common (MEXT 2012). Students qualify for higher education not by school examinations but by entrance tests, which are either conducted by a national agency or by the universities. These tests are only conducted once per year, and the test competitiveness depends on the field of study and the prestige of the university (Maruyama 2008). Bachelor's degrees can typically be obtained in four years, Master's two years, and doctoral studies five years. However, not each university has such graduate programs. At junior colleges, associate vocational-oriented degrees can be earned in between two and three years (MEXT 2012).

Japan		Year
Expenditure per student in tertiary education	9,453 PPP$	2014
Gross domestic expenditure on research and development as percentage of GDP	3.58%	2014
Gross domestic expenditure on research and development by higher education sector	12.58%	2014
Gross enrolment ratio in tertiary education	63.36%	2014
Gross graduation ratio (ISCED 6 and 7, first degrees)	47.09%	2014

The expenditure per student in the higher education sector is, with less than 10,000 PPP$, lower than in Germany. However, the gross domestic expenditure on research and development is with 3.6% of Japan's GDP considerably higher. About 13% of it is spent in the higher education sector (UNESCO Institute for Statistics 2017).

The gross enrollment ratio is 63%, with a slightly higher proportion of males (66%) than females (61%) being enrolled. The graduation ratio is 47%, showing a comparable gender imbalance (UNESCO Institute for Statistics 2017). In 2013, there were 782 universities, 359 junior colleges, 57 colleges of technology, and 3216 specialized training schools in Japan. 606 of the universities were private institutions (MEXT 2017). Two Japanese universities are ranked in the top 200 of the Times Higher Education ranking. The University of Tokyo reaches the highest placement with a rank of 39, while the Nagoya University ranks in the 301+ (Times Higher Education 2016).

Most researchers in Japan work in the business sector (74%), followed by higher education (20%), the government, and private non-profit organizations. In 2014, less than 15% of all researchers were female (UNESCO Institute for Statistics 2017).

Isa Steinmann & Rolf Strietholt

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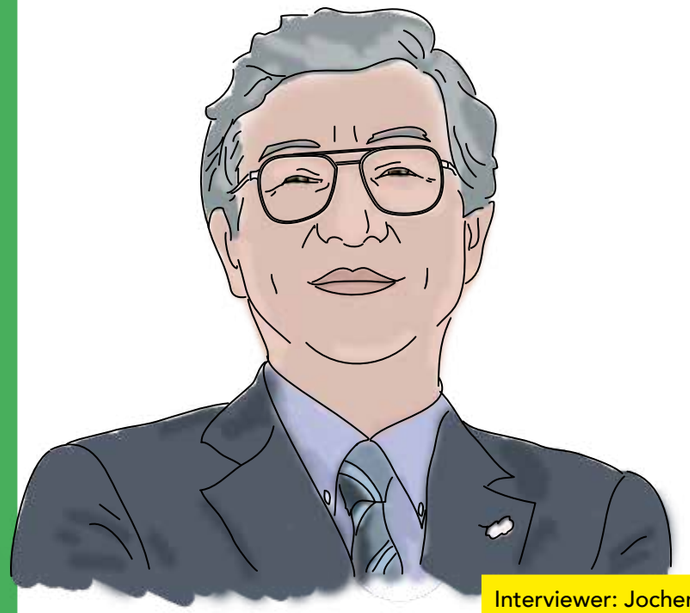
YOSHIHITO WATANABE



Interviewer: Jochen Niemeyer

Position: Full Professor, now Vice-President of Nagoya University

Institution: Nagoya University, Japan

Teaching time: 25 years

Teaching load: 3 x 90 minutes times 15 days in a year
(in past, during time as Chemistry Professor)

Teaching: Bachelor and Master

Teaching methods: Blackboard, discussions

JAPAN

Interviewer: How do you think the prestige of teaching is in Japan?

Watanabe: Usually when we open a position, like for an associate professor, we are always worried about their research activities. Of course we ask about teaching experience, but the weighting of the teaching is not so heavy because we need good researchers.

Interviewer: On the other hand how important do you think teaching is for the education of the students?

Watanabe: Especially for the undergraduates, we need good teachers. For the first and second year students, we need to ask the best scientists to teach because their talks stimulate young freshmen. So the 'big' professor has to teach for the first or second year to stimulate them. However, usually associated professors have to take the freshmen, frankly. But in my opinion, the 'big boss' also has to teach.

Interviewer: So at Nagoya University, is there a special way of teaching?

Watanabe: We have special programs for the first year students. Usually, general chemistry classes are 40-100 students. But we have very small classes, which are very entry-level, with only 10-15 students. So the professors share 90 minutes with them, not just to teach something but to give a general idea about what is going on in chemistry, about what we know here and what we should solve. Also then we ask the students to study the information given in the lectures and discuss it together.

Interviewer: So, when you were an active teaching professor, did you feel that the university supported you as a teacher?

CITATIONS

After retirement, if the university asks me to continue teaching, I would be very happy to teach.

We have to teach them how to learn, how to brush up their imagination.

Watanabe: I think so [both laughing]. Actually they don't have enough of a support system for the faculty members to teach. Of course we organise faculty development. However it's not systematic and many professors don't want to take part in faculty development - it's boring or they feel that they don't want to waste time.

Interviewer: What do you expect from the students, should they be prepared for the class?

Watanabe: I don't think I can expect the students to be well-prepared. Especially at high school, they work too hard to learn because they have to pass the entrance exams - it's really hard, especially for these top universities. And after enrolment, they like to feel relaxed as enrolment was their final destination, when they were high school students. So that after enrolment, some really, you know, don't want to study hard. They like to enjoy things.

Interviewer: So how do you try to motivate students?

Watanabe: Especially in the first two years, every student, freshman, if we manage to stimulate them, then in the third and fourth years they will also be able to learn more about the chemistry. I think the first and second year must be taken carefully, so that the encouragement is there. Also to teach them how to learn and find the information they need. Also some students have difficulties understanding, especially chemistry, so we would need more teaching assistants. But in Japan, we don't have a TA system. It's a bit different from the US.

Interviewer: As a teacher do you feel it's boring to tell the same things over and over again?

Watanabe: No I don't think so because each time, each year, even though I taught the same content, the response from the students was different. Some of them used to ask me good questions, which were not easy for me to explain.

Interviewer: So do you think that teaching, personally for you, increases your happiness?

Watanabe: Oh yeah! Teaching is fun for me, especially for the undergraduates, the freshmen, first and second years. Because they don't know very much about the real science. So that after retirement, if the university asks me to continue teaching, I would be very happy to teach.

Interviewer: Where do you get new ideas for lectures?

Watanabe: Occasionally, during seminars or meetings, someone's presentation inspires me. But personally I do not want to use PowerPoint for undergraduates. PowerPoint looks nice, everything's there, but for these undergraduates students, I don't think they really understand. It goes too quickly, and the images are OK, but after that it's all gone.

Interviewer: What is good teaching for you?

Watanabe: Good teaching ... don't teach everything, maybe give them 60% of the textbook then ask the 40% by just trying to understand by reading the text.

Interviewer: OK, and on the other hand, what is bad teaching?

Watanabe: Bad teaching? ... If you try to teach everything that is in the textbook, it's too much.

Interviewer: So do you have any advice for young researchers, who are beginners in teaching?

Watanabe: What I do is the following: On the first day, I don't tell them anything about the real contents. I tell them what we are researching, or going to be researching, what the most difficult challenges are. It's very enjoyable. So that the first day they are just given the incentives or stimulation.

Interviewer: So what do you think is the main task of university education?

Watanabe: For the undergraduate programs, I think, to educate generally. Also we have to teach how to learn so that after they graduate they can do everything by themselves. We have to teach them how to learn, how to brush up their imagination. But for master and PhD programs, they must be specialist-like. We put them into the actual research subjects but it's just training. Society or the public likes to welcome our graduates as 'scientists', but they have to be well trained.

Interviewer: So, do you think that in 20, 30 years, university teaching will be very different?

Watanabe: Oh yeah, I think so. 40 years ago I was a student and the teacher kept reading the textbook but never discussed anything with us in the class. Now, we keep asking the students about many things. It's time consuming but it's the reason why I told you that I like to teach them just 60%.

Interviewer: OK so that was all the questions, thank you very much.

SATOSHI ABE

Interviewer: Jochen Niemeyer

Position: Assistant Professor

Institution / Country: Tokyo Institute of Technology, Japan

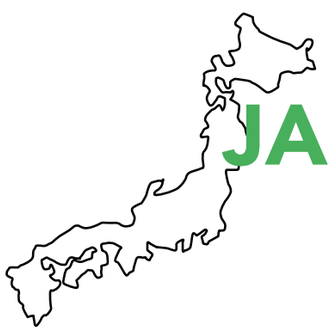
Subject: Chemistry

Teaching time: 4 years

Teaching load: 14 days per year

Teaching Bachelor / Master / Graduates: Bachelor

Teaching methods: Lab courses



JAPAN

Interviewer: How do you think the status or the prestige of teaching is rated? For a professor, is it important that they're a good teacher?

Abe: In my opinion, I think that for the professor and researcher, the first priority is their research. They need to write papers, get funding, to find new scientific discoveries. But to get good research, of course we need collaborators, students. So it's important to teach these students, too. The master course – not the lecture but in the laboratory – we can educate these students also.

Interviewer: So, if other people evaluate your work as a professor, how important is the teaching part of your job?

Abe: Now I'm an assistant professor, so probably I want to get an associate and then full professorship. However, for those promotions, maybe good teaching is not too highly valued. The main part is research.

Interviewer: How important was good teaching for you to become a good chemist?

Abe: In chemistry, there is both teaching in classrooms and in the lab. For me when I was a Bachelor student, the first, second, third year of being a Bachelor student, I took many classes. However, it was difficult for me to understand all the content of the classes, because I was passive in the classes. But the education in the laboratory was more useful for me to be a good scientist. After entering the laboratories, the purpose, the aim, is more clear – to get good data and then to become a good scientist or chemist. So I think the education in a laboratory is the most important.

Interviewer: OK. So, let's talk a little bit about the students. How do you try to interact with the students? And how do you try to motivate the students?

Abe: [Laughs] Motivate . . . at the moment, I am responsible for the lab teaching. In the experimental practice, I show the students what the experiment is, and I show them how to perform it. This explanation is a help for the students, and then they can understand what they are doing.

Interviewer: So does it become boring for you to teach the same thing again and again and again?

Abe: No, I change it a little bit every year. For example, one experiment last year it didn't go well, so this year we changed for a better experiment.

Interviewer: When teaching the theoretical parts, what do you think is the best way for the students to learn something – e-learning or classroom teaching?

Abe: I think the classroom is better. So, if you have some question you can go to the professors directly. This is a very important thing here. And then face-to-face discussion or teaching is also important to feel what the students are thinking.

CITATIONS

For classroom-teaching, it would be better to have teaching-only staff.

I think the education in a laboratory is the most important.

Good teaching means not just teaching but rather collaboration.

INTERVIEWER: A very general question – what is good teaching for you?

ABE: I think for me the important thing is the laboratory teaching. Good teaching means not just teaching but rather collaboration. I think that to do good science or good chemistry is very important, for me and for students. And to get good papers and then to get a good result. I think during this process we can teach the student.

INTERVIEWER: What do you think is the main task of teaching or education at the university? Is the main task to produce research results or to educate people, or maybe something else?

ABE: I think the main task is to research. But of course producing educated people is also an important task.

INTERVIEWER: Do you think that in 20-30 years, teaching will be different at university?

ABE: Maybe a little different. There are now many foreign people, so after 20-30 years there will be more foreigners. So, of course education will really change.

INTERVIEWER: Do you have any advice for someone who is teaching for the first time?

ABE: [Laughs] I want the advice! [Both laugh]

INTERVIEWER: So, at my university, there are also some education programs for professors, for example about teaching techniques or how to do better teaching. Is something like that available for you?

ABE: No, I don't think so. But I think that for classroom teaching, it would be better to have teaching-only staff. Now, in Japan, there are none of this kind of full-time lecturers.

INTERVIEWER: From what I understand, you think that the students also learn a lot when they work in your group, right? So, during research?

ABE: Yeah. For me, teaching in the classroom and in the laboratory is different. Teaching in the laboratory is very important for the supervisor, and the student also. And then, when I am working with him or her, and the student gets some awards, for example, poster awards or presentation awards, then I am happy, too.

INTERVIEWER: OK, that's it. Thank you very much!

WHY DOES TEACHING INCREASE HAPPINESS? DOES TEACHING INCREASE YOUR HAPPINESS?

Barceló: Because you learn while you teach. And, for me, happiness is learning, essentially. Now, if you are asking me why teaching increases the happiness of the students, I have no idea. That is just why it increases my happiness [laughs] . . . I am very selfish as a professor.

Vernekohl: It always brings one to the edges of one's own skill and abilities, and one is able to expand them.

Watanabe: Oh yeah! Teaching is fun for me, especially for the undergraduates, the freshmen, first and second years. Because they don't know very much about the real science. So that after retirement, if the university asks me to continue teaching, I would be very happy to teach.

Aldridge: [laughs]. The answer to that question would depend on when you ask me. If you asked me that question on a Thursday night, having to mark a pile of questions for Friday's tutorial, I would say no. On the other hand, what I really like doing is the interaction with the students in the tutorial, actually teaching them stuff and sharing things from a new angle – that can be extremely rewarding. If you asked me on a Friday afternoon, then yes.

Lindner: I'm not completely sure it does!

Banerjee: [laughs] If you think about it on a personal level, yes. When I explain some topic and if I feel that students are understanding, and in some cases I think they appreciate it also, that actually gives you satisfaction.

Anderson: I've discovered that I'm not a lecturer. Standing in front of a classroom delivering a lecture is just not something I enjoy. I really enjoy interacting with the students in small groups like in a lab, in projects, mentoring one-on-one, small classes, discussion groups.

Bojańczyk: I think some people, not all but some, including myself, like to tell things to other people. It's the same question like why do you talk instead of listening. It's irrational to talk, you're not gaining so much. If you listen, you learn new things, but somehow, some people at least, they want to talk. It's a stupid behaviour, but there you go.

Lange: Because I enjoy teaching or telling young people about the things that thrill me. If there is interaction, and you get the idea that the students understand, they ask interested questions that show me that they have understood. That's just a lot of motivation, so that makes me happy.

Krans: It depends [both laugh]. I am also happy without teaching, but it can be fulfilling if you see that people actually take away something that you try to convey. Also to help shape an individual's outlook on the world, but perhaps that's a bit of propaganda [laughs].

LEBANON

In Lebanon, the Ministry for Education and Higher Education is primarily responsible for all issues concerning higher education, while there are further special departments for vocational training, etc. There is non-tertiary post-secondary education is the fields of technical and vocational training, as well as higher education. The sector comprises Technical and Vocational Institutes, universities, university colleges, and university institutes with the languages of instruction Arabic, French, or English. For higher education, one qualifies with secondary education certificates and sometimes additional entrance exams: at the end of secondary education, students absolve the Baccalauréat Libanais (general school leaving certificate) or the Baccalauréat Technique (profession-oriented school leaving certificate). Depending on the subject of study, there are short- and regular-cycle studies between two and five years in first-cycle studies. Degrees are either profession-related or Bachelor's and diplomas equivalents (ISCED levels 5 and 6). The length of the consecutive second-cycle studies (ISCED levels 7) also highly depends on the study subjects (MEHE 2017).

The government spent 2.57% of Lebanon's GDP on education in general in 2013, which amounted to about 9% of the total government expenditure. In PPP$, the government spent about one-sixth of the amount spent in Germany per student in tertiary education (UNESCO Institute for Statistics 2017). Especially the private higher education institutions are not only sponsored by the government but also by student tuition fees (MEHE 2011, 2017).

The enrolment ratio of the tertiary school age population is almost 43%, with a higher proportion of females (46%) than males (40%) enrolled. Graduation rate in first degrees in ISCED levels 6 and 7 is about 28%, showing a similar higher proportion of females (30%) than males (26%) graduating (UNESCO Institute for Statistics 2017). In 2010, there were 41 higher education institutions in Lebanon, while only The Lebanese University was a public institution (MEHE 2011). No higher education institution in Lebanon is ranked in the top 200 of the Times Higher Education ranking. The American University of Beirut is ranked in the 501+ (Times Higher Education 2016).

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Lebanon		Year
Expenditure per student in tertiary education	2,675 PPP$	2013
Gross enrolment ratio in tertiary education	42.77%	2014
Gross graduation ratio (ISCED 6 and 7, first degrees)	28.09%	2011

Isa Steinmann & Rolf Strietholt

DIANA JAALOUK

Interviewer: Bilal Gökce

Name: Diana Jaalouk

Position: Assistant Professor

Institution / Country: American University of Beirut (AUB), Lebanon

Subject: Biology

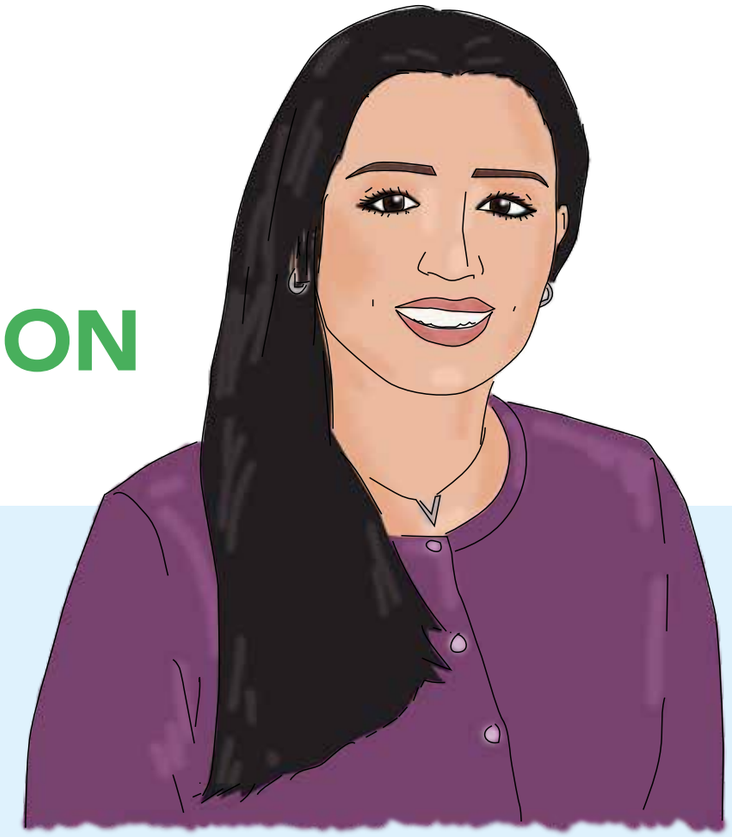
Teaching time: Since 2010

Teaching load: 15 credits / year (3 to 4 courses in 2 of 3 terms)

Teaching Bachelor / Master / Graduates: Mostly seniors

Teaching methods: Open discussions, forum discussions on hot news

LEBANON



Interviewer: If you want to be a very successful professor of biology in Lebanon, do you need teaching?

Jaalouk: First, here it's not even an option not to teach – you have to teach, it's part of the job description. Although many of the universities in Lebanon are moving now to in-college research, we are teaching institutions to start with, and this is perhaps the strongest legacy of a university like AUB, which ranks relatively well internationally. When the time comes for me to apply for promotion or eventually for tenure, they will look at my teaching performance, and how well I've been teaching, how much I've been teaching, etc. It doesn't mean that research is not important, we do also have research here that's very important, but they go side-by-side.

Interviewer: So your university is classified as a teaching university?

Jaalouk: When it was founded, it had been founded initially as a teaching college, but eventually, to excel in teaching, it's good to also be good in research. I think you can't separate the two; they bleed into one another. Also, you can be a much better researcher when you teach, so I think they are really not mutually exclusive at all. If you want to be recruited by the faculty you have to have a solid research experience and background. At the same time, you are expected to do three things when you are recruited here: to teach, to have an active research platform, and to be involved in service, such as committees or in the department.

Interviewer: How do you evaluate how well you are teaching?

Jaalouk: There are term-by-term evaluations we refer to as IC (Instructor Course) evaluations. These are all online surveys sent to students for each course. Moreover, we solicit feedback from students regarding course learning outcomes (CLOs). The students give us feedback on how well they think the instructor helped them meet the CLOs.

CITATIONS

But eventually, to excel in teaching, it's good to also be good in research. I think you can't separate the two; they bleed into one another.

When the time comes for me to apply for promotion or eventually for tenure, they will look at my teaching performance.

Even for me, if I see myself more as a researcher than as a teacher, teaching is important because it helps me in my research, whether I like to admit it or not.

Additionally, many of them have to sit the GRE (Graduate Record Examination), which is a standardised exam. And sometimes we are given some kind of feedback about our teaching performance, based on how well our students do on the standardised test.

Interviewer: Are you happy with how teachers are perceived at your university?

Jaalouk: I think the greatest satisfaction you get is from the students themselves.The best support you get is when sometimes, unsolicited, they just send you an email during the break, or after they graduate, a few lines saying how much this course has increased their interest in a given topic or how much it affected them. So this is something I find very encouraging, because in the end this is what matters, truly, the students.

Interviewer: Can you say something about your lectures?

Jaalouk: The lectures that I give are like an open discussion session with them. It's very interactive. I rely only on a select number of slides, and a lot of the time we actually take the time to really have a rebuttal. Often, in every semester I choose for them six emerging themes in the field. So it's far from a traditional, typical, didactic lecture. This is why they have to read, and they have to come prepared to class. Also, there are end-of-term projects like writing a grant proposal or research paper presentations. For undergrads it is different. They get clear assignments and exams with multiple-choice tests. The Lebanese system in school is pretty much like that, and they need some time to change it into the format of college learning.

Interviewer: Why do you teach?

Jaalouk: Even if I see myself more as a researcher than as a teacher, teaching is important because it helps me in my research, whether I like to admit it or not. When I teach, it forces me to streamline the information, especially at the graduate or senior level. I think the students need some guidance to help them navigate through and streamline information. And when I force myself to do this for the students, I actually am doing it at the same time for me.

Interviewer: What would you say. Which type of technique is the most effective way to teach?

Jaalouk: Occasionally I give them a break, so even though the projector is on, the PowerPoint is on, I just take the markers with three different colours and we start to draw things and say, 'OK, what happens if you mutate this, or if you actually delete this tumour suppressor, or if you activate this promoter'. I don't use clickers, just by a show of hands we can discuss this. So if you do this two or three times during the lecture it avoids the redundancy of going through the PowerPoints. It's really a dialogue between me and the students.

Interviewer: Talking about the students, do you have any moment that you encountered during your classes that you haven't forgotten, something funny, something interesting, anything that happened in your class?

Jaalouk: I think a lot of funny moments happen in class [both laugh]. Here, you know sometimes the electricity goes off and the generators take time to kick in. So this is kind of a few minutes thing between you and the students where you have two options basically, to waste the time or to make use of the time to discuss something you just explained. And often it's during that time that many students tend to raise their hands to ask very intriguing questions. This is what I've noticed. It's as if during the regular class time, when they expect the traditional way of teaching, some of them are a little bit conservative, and they are less likely to engage or ask questions. But when the electricity goes off, it's as if now we are outside the class and now they are free to ask whatever they want.

Interviewer: Do you have any advice for beginners in teaching?

Jaalouk: It is important for a new beginner not to have a psychological barrier to teaching. If they were to think of it as a burden, just try to embrace it initially. If it's difficult the first year, don't give up, just sail through it. Try different things – it doesn't hurt, because not everything is going to work out well, especially not the first time. And eventually, each instructor, I do believe that, each instructor, sooner or later they will really find their equilibrium.

Interviewer: How will teaching change in 20-30 years?

Jaalouk: I don't think there's a perfect teaching method or a perfect teaching tool. Certainly not one that one could apply and generalise across the board, because what might be a teaching tool that is of preference to a chemist or a mathematician, might not be the best one for me. But even within biology, the optimal teaching tool or teaching methodology for a freshman student might not be the same one that you can use for a graduate level one. I think 20-30 years from now, you are going to see more of a reliance on digital media. I even notice that when I give them assigned reading from a hard copy paper or a book, fewer of them tend to read it than if I give them assigned reading from the internet. But one thing is for sure, it's still important for good quality teaching to have this direct interaction between the student and the professor, whether it happens in the setting of the classroom, the setting of workshops, or a three-day condensed symposium on college, I don't know. But time that's one-on-one and between the students themselves also, it's very important.

Interviewer: Thank you for your time!

NETHERLANDS

The Netherlands is an EU country and belongs to the European Higher Education Area and therefore participates in the Bologna process and the ERASMUS+ program. The Dutch state has the overall responsibility for education in general, although the system also shows decentralized characteristics. However, the Ministry of Education, Culture and Science sets the statutory and legal framework, and the Inspectorate of Education oversees processes at all stages of education.

There are both publicly funded and private state-accredited higher education institutions. Students usually finish secondary school at age 18 and qualify for higher education with a school and a national examination. There are Hogescholen (universities of applied science) where profession-oriented Bachelor and Master degrees, but also associate degrees (two-year short-cycle programs), can be absolved. Universities are generally academically oriented and award ISCED level 6, 7, and 8 degrees. Typically, Bachelor studies take three years at universities and four years at profession-oriented institutions, and Master programs between one and two years (EURYDICE 2017).

With about 15,500 PPP$, the government in the Netherlands spends a little less per student in tertiary education than the German one. The gross domestic expenditure on research and development is almost 2% of the Netherlands' GDP, while about one-third of this is spent in the sector of higher education. More than half of the gross domestic expenditure on research and development is spent in business enterprises and about one-tenth in the government sector (UNESCO Institute for Statistics 2017). First-, short-, and second-cycle studies all require the payment of centrally set tuition fees. There are both student loans and need-based grants available to support the students (European Commission/ EACEA/EURYDICE 2016).

The gross enrolment ratio in tertiary education is almost 80%, with more females (83%) than males (75%). The gross graduation ratio of ISCED level 6 and 7 first degrees in this age group is about 46%, with an even more pronounced gender gap (53% of females and 38% males) (UNESCO Institute for Statistics 2017). Thirteen higher education institutions in the Netherlands are ranked in the top 200 of the Times Higher Education ranking. The Delft University of Technology scores the highest with the placement of 59 (Times Higher Education 2016).

About two-thirds of all researchers work in business enterprises, more than one-fifth in the higher education sector, and about 10% are employed in the government sector. Less than every fourth researcher is female (UNESCO Institute for Statistics 2017).

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Netherlands		Year
Expenditure per student in tertiary education	15,457 PPP$	2012
Gross domestic expenditure on research and development as percentage of GDP	1.97%	2014
Gross domestic expenditure on research and development by higher education sector	32.31%	2014
Gross enrolment ratio in tertiary education	78.50%	2012
Gross graduation ratio (ISCED 6 and 7, first degrees)	45.61%	2014

Isa Steinmann & Rolf Strietholt

WOLF GERO LANGE

Name: Wolf Gero Lange

Position: Assistant Professor

Institution: Radboud University Nijmegen, Netherlands

Subject: Clinical Psychology / Behavioural Science

Teaching time: 12 years

Teaching load: 50% of full time

Teaching: Bachelor / Master

Teaching methods: Games, sketches

Interviewer: Marcella Woud

Interviewer: Are you happy with the status and prestige of teaching in your country, and why?

Lange: Yes, I guess so. I never got the idea that teachers or lecturers, at the university at least, have a bad reputation…

NETHERLANDS

Interviewer: And how do you assess the significance of teaching in the scientific system in your country?

Lange: It's very important. One idea is to improve both sides. For example, at Radboud university they are striving to have all lecturers, eventually, to have PhD-students. They want them to have a stronger scientific background, not only being able to teach but also being able to do research. And the other way around, the PhD students must teach, even though it is only one day per week. They want both sides in it, not a pure lecturer, not a pure researcher, which in my eyes makes a lot of sense.

Interviewer: And if you look at your university organisation, how well perceived and supported is teaching?

Lange: I get the idea that they are very keen on having a good atmosphere for the teaching staff. The framework is very good, but still the teaching load is fairly high, but they try to provide good help. If you have to teach courses in the English language, you can take courses for that and get some language help and so on.

Interviewer: And how important is, or was, good teaching for your professional career?

Lange: I had all those restricted contracts for one or two years, in which I did a lot of teaching. Actually, having the students' evaluations, and them being fairly good, did help to get my current position. I had experience with treating patients, in doing research and good evaluations from my teaching. As a whole, this did give me my job that I have now.

Interviewer: Do you think that being a professor is a reputable profession?

Lange: In general, I think it is. I believe that it's probably somewhat different in the Netherlands compared to Germany, because the Dutch are not as proud of titles as the Germans are. Besides that, in Germany, there are rarely new professor positions, while in the Netherlands, they sometimes just simply make new positions when somebody is in his development and ready for an upgrade.

Interviewer: Students expect that you are well prepared and open for questions; conversely, what do you expect from your students?

Lange: I do like questions and interaction. I just enjoy lectures much more if there's interaction, and it also helps with learning, because they can see if they understood the thing if they explain it back to me or if they answer questions. So that is actually the most important thing for me, that they do interact, that they do ask questions.

CITATIONS

I do like questions and interaction. I just enjoy lectures much more if there's interaction.

We have a lot of discussions about whether [university education] is about educating people for a job, if it is primarily for your personal development, or whether it is to make you fit as a scientist. For me, personally, it's a combination of the three.

Interviewer: And how do you motivate students to interact?

Lange: In lectures I try to have some interactive stuff in there. Either I play a little sketch, or sometimes I also have something, where I need volunteers. That just kind of opens it up and makes it more interactive.

Interviewer: In one sentence: why do you teach?

Lange: I guess because I enjoy telling young people about the things that I like, about my hobbies or about my work, about the things that fascinate me. That's the basic motive I guess.

Interviewer: And why does teaching increase happiness?

Lange: Because I enjoy teaching, or telling young people about the things that thrill me. If there is interaction, and you get the idea that the students understand, they ask interested questions that show me that they have understood. That's just a lot of motivation, so that makes me happy.

Interviewer: Where do you get new ideas for your lectures?

Lange: Well, a whole lot of different places, conferences, symposia, hearing about the way that other colleagues teach. Also we have special days on which teaching is very much in focus, and then people from different faculties just get together and talk about new innovations in teaching.

Interviewer: OK, then three questions about opinion, "Good teaching is...?"

Lange: Thinking about the goal, what you want to achieve, good teaching would be to eventually educate young people to be critical and enthusiastic about the things that they do. Thinking about the teachers themselves, good teaching would be being thrilled about the subject that you talk about, making use of all available means to communicate that.

Interviewer: So then "Bad teaching is...?

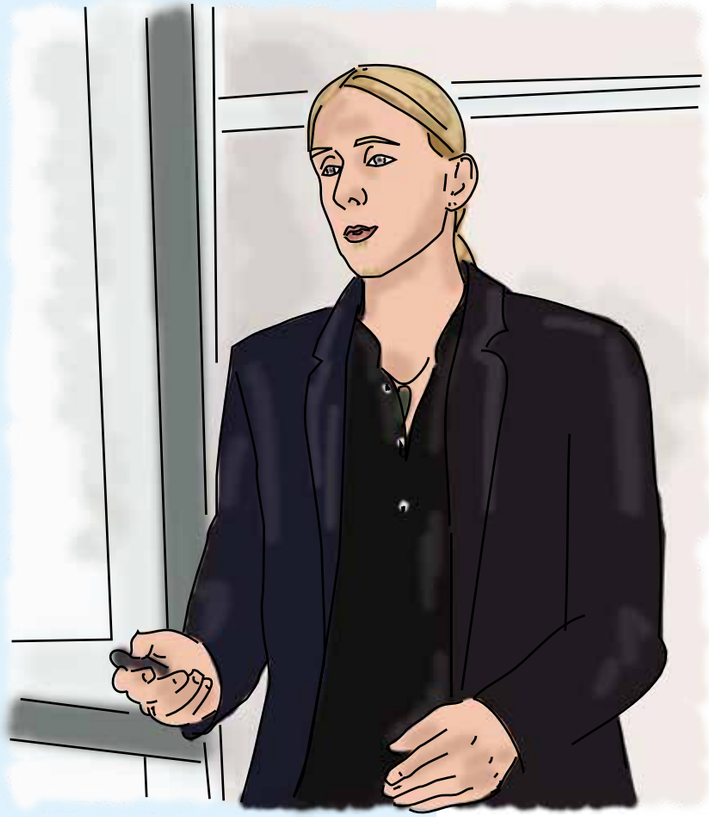
Lange: Bad teaching is no interaction, not updating your stuff, not making use of the technical possibilities that you have, not responding, or caring about, what the students think.

Interviewer: Can you share a story of a moment that you encountered during teaching?

Lange: Always memorable is when I am teaching about social anxiety. What I usually do is I have some funny hat on, and I come into the lecture hall from the back, then I ask students if they want to come down and do a funny dance together with me. Usually no student does that, but in one case one student joined. We had this Dutch children's song that we sang and the whole lecture hall would join in, they would clap and sing along. This was very, very funny.

Interviewer: A rather philosophical question: What is the main task of university education?

Lange: We have a lot of discussion about that, whether it is about educating people for a job or if it is for your personal development or whether it is to make you fit as a scientist. For me, personally, it's a combination of the three.



Interviewer: And where do you see teaching at university level in 20-30 years?

Lange: I can imagine that it's probably going to be much more digitalised, that a lot of things will probably happen, not live any more. I suppose it's going to be less one-to-one student interaction, which I would find very sad, but I suppose that would probably be the way it's going to be.

Interviewer: Do you have any advice for beginners in teaching?

Lange: When you are very young and you have just followed some lectures themselves, you have a pretty good idea of what you think is good teaching. So learn from very good models, I suppose that is one part. The second part, I think, is that you start off taking over parts of courses from somebody, from a senior lecturer, for example, not just the whole thing but maybe a bit, and just get acquainted, and get used to it, and not having to provide 1.5 hours of lecture from scratch, rather having the materials, or having slides, and tailoring them in a way that fits you, rather than having to come up with a complete new lecture.

Interviewer: Thank you very much!

GOOD TEACHING IS?

Vernekohl: Good teaching is . . . being self-reflective, open, critical and empathetic towards the students, I think.

Watanabe: Good teaching . . . don't teach everything, maybe give them 60% of the textbook, then ask the 40% by just trying to understand by reading the text.

Barceló: . . . having the students motivated. Having at least half of the course attending the class.

Muheim: . . . adapts the teaching level to the students and interacts during teaching.

Abe: Good teaching means not just teaching but, rather, collaboration.

Deressa: Good teaching . . . should be student-centred.

Peres: I would say that good teaching is understanding that the teacher also was learning once, that they don't know everything.

Painter: Good teaching is piquing the students' interested in the subject matter.

Aldridge: Good teaching is . . . essential [both laugh]. Good teaching is allowing students to think for themselves.

Jaalouk: A two-way dialogue between me and the students.

Phillips: Good teaching is stimulating students to be able to see alternative explanations for evidence and to figure out how to distinguish between those alternatives, or to find out if they can distinguish between those alternatives.

Hackländer: . . . decisive for having good students.

Frerich: For me, good teaching is enabling the students to understand things and work new things out for themselves, so being more of a coach rather than someone who is dictating stuff.

Lindner: I think a really good course is one in which you can feel the personality of the person that is teaching the course.

Banerjee: A good teacher must present the concepts in a nice way, but he should also make sure that the students are able to understand the concepts and are able to solve problems.

Anderson: Good teaching is when students are prepared for follow-on classes or follow-on material.

Lange: Thinking about the goal, what you want to achieve, good teaching would be to eventually educate young people to be critical and enthusiastic about the things that they do. Thinking about the teachers themselves, good teaching would be being thrilled about the subject that you talk about, making use of all available means to communicate that.

Krans: . . . making the information as relevant as possible, but also being up-to-date.

POLAND

Isa Steinmann & Rolf Strietholt

Poland is an EU country and belongs to the European Higher Education Area. It, for example, participates in the Bologna process and the ERASMUS+ program. Since the political transformation in 1989, the Polish education system changed profoundly. The higher education system is primarily regulated by the Ministry of Science and Higher Education.

Nowadays, students who finish upper secondary education are typically 19 years old and can decide to complete their Egzamin Maturalny (upper secondary examination), which qualifies them for entering tertiary education. Primarily there are two sorts of Uczelnia (higher education institutions): the Uczelnia Akademicka and the Uczelnia Zawodowa, which both offer ISCED level 6 and 7 programs, with only the Akademicka offering ISCED level 8 programs. Most higher education institutions are public. Admission to certain first-cycle studies requires a specific numerus clausus of the Egzamin Maturalny.

The ISCED level 6 programs take between three and four years and result in the Licencjat or the Inzynier (bachelor degree equivalents). After finishing first-cycle studies, students can enter second-cycle programs that typically take—depending on the subject—between one and a half and two years and result in the Magister (Master or equivalent). Third-cycle studies are provided at Uczelnia Akademicka and research institutions and last for three to four years. However, for certain subjects like medicine or dentistry, there are also long-cycle programs, which take between four and six years and result in a degree equivalent to a Master. Short-cycle higher education is provided at Kolegium Pracowników Służb Społecznych (colleges of social work), which follow the school education framework and are not counted among the higher education institutions. Another current differentiation is made between Studia Stacjonarne (full-time studies) and Studia Niestacjonarne (part-time studies) (EURYDICE 2017).

With about 6,000 PPP$, the government expenditure per student in tertiary education amounts to only about one-third in Germany, and the gross domestic expenditure on research and development is lower than 1% of Poland's GDP. Almost one-third of the latter is spent in the sector of higher education, while the rest is spent in the sectors of business enterprises, government, and private non-profit organizations (UNESCO Institute for Statistics 2017). If students are from Poland, study full-time, and do not repeat study courses, they are typically not charged any tuition fees, although there are low administrative fees, as well as exceptions at certain institutions. There are both need-based and merit-based grants, as well as loans, tax reliefs, and family allowances (European Commission/EACEA/EURYDICE 2016).

The gross enrolment ratio in tertiary education is higher than 70%, with a pronounced imbalance between females (87%) and males (56%). The gross graduation ratio is almost 50% and shows the same imbalance in comparing women (64%) and men (36%) (UNESCO Institute for Statistics 2017). In total, there are 19 Uniwersytety (non-specialized universities), and numerous further higher education institutions (EURYDICE 2017). None of the Polish higher education institutions is ranked in the top 200 of the Times Higher Education ranking (Times Higher Education 2016).

About two-thirds of all researchers are employed in the sector of higher education, with smaller proportions in business enterprises and the sectors of government and private non-profit organizations. 37% of all researchers are females (UNESCO Institute for Statistics 2017).

Poland		Year
Expenditure per student in tertiary education	5,918 PPP$	2013
Gross domestic expenditure on research and development as percentage of GDP	0.90%	2014
Gross domestic expenditure on research and development by higher education sector	29.16%	2014
Gross enrolment ratio in tertiary education	71.16%	2013
Gross graduation ratio (ISCED 6 and 7, first degrees)	49.47%	2014

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MIKOŁAJ BOJAŃCZYK

Position: Professor

Institution / Country: Warsaw University, Poland

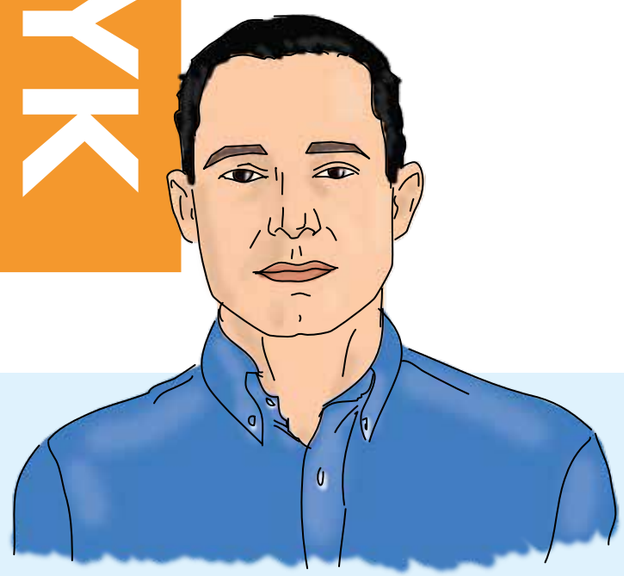
Subject: Computer Science/Mathematics

Teaching time: Since 2000 (started as PhD), 2005 normal

Teaching load: Formally, the teaching load is seven units, where a unit is one semester of having 1.5 hours every week per year

Teaching Bachelor / Master / Graduates: Bachelor and Master

Interviewer: Thomas Zeume



Interviewer: Are you happy with the status and prestige of teaching in your country?

Bojańczyk: Yes. I think that university people have relatively high prestige as compared to other places. There is even too much status, I think. Definitely enough [both laugh].

Interviewer: How do you assess the significance of your teaching?

Bojańczyk: Of course, I like the research that I'm doing, but it's not obvious what the societal impact of that will be, and it's likely small, because it's a high-risk venture, as most people, in theory, do something that will be likely completely useless. But if you just teach people, you know, logic and stuff, that might have some impact, and it's important for the sanity of the person. That's one reason for teaching, and the other is a little bit more cynical, that you want to attract students to continue your own research, which is also important.

Interviewer: Does your faculty support teaching? Or is it somehow encouraged to teach?

Bojańczyk: There is very little incentive for good teaching, getting new positions is based mainly on research. Similarly for the advancement in the hierarchy. The hiring committees have access to how students grade your courses, but they actually don't look at it. . . . If you have something scandalously low or you don't come to your classes, maybe somebody will notice, but as long as you come at least once every two weeks and you are sober, nothing bad is going to happen to you. I don't think there's too much of a systematic pressure in teaching, and amazingly, despite this, a lot of people put effort into teaching.

Interviewer: What do you expect from your students?

Bojańczyk: Well, one simple thing is that I expect them to be smart, which is kind of an asshole thing to say, but there you go. And it's a reasonable expectation – we have very good students, there's an entrance exam, and typically they are very good, in this sense. Another thing that I would expect is just basic decency, like coming to class and not making noise. I think that my classes are extremely pleasant, the students are very good, and it's just nice to talk with them.

Interviewer: How do you motivate your students?

Bojańczyk: I don't think I do. No, I don't have any specific strategies for that. I guess that the students are motivated on their own. Remember that I teach years three to five, so there's less of an issue with that.

Interviewer: So the next question has to be answered in one sentence, so you should think carefully about it – you don't have to, but you can. Why do you teach?

Bojańczyk: Draft 1: Because I like to. And I guess I should say what I like to do other than teaching. I would put it a little bit pretentiously: "Because I like to share knowledge." But, please don't put this at the beginning of the chapter – like, Mikołaj Bojańczyk: "I like to share knowledge". I immensely enjoy teaching and I love to do it. It's just a lot of fun, and with good students, which they are, it's just great fun.

Interviewer: Let's see whether we can arrange for this [laughs]. Isn't it boring to teach the same things over and over again?

Bojańczyk: Oh, it sounded like a personal question [laughs]. Well, amazingly, no. It is strange, but I don't get bored. I haven't done the exact same course many, many times in a row, but some of the lectures I've done three or four times, three times maybe. And there's always a little bit of difference, and it allows you to sort out your own thoughts carefully. I think that by teaching something – it's a common view – by teaching something, you clear the structure in your own head, which is very useful I think. So that's another motivation for teaching advanced courses.

Interviewer: Another question: where do you get new ideas for your lectures?

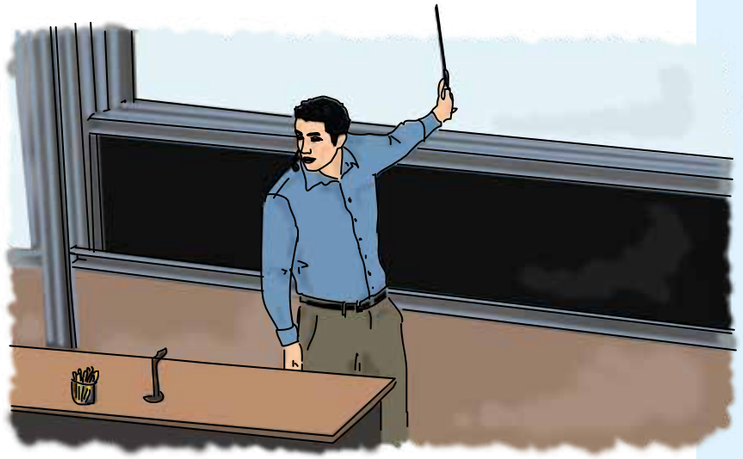
CITATIONS

I like to share knowledge.

If you go outside your comfort zone and you stop teaching your usual topics, and you instead teach something that you've been doing for two years that the students have been doing for one, then you realise it's not the students that are stupid, it's just that the material is difficult.

By teaching something, you clear the structure in your own head, which is very useful.

Bojańczyk: I try to find some body of material that I think . . . is a self-contained unit, and I try to present it so that it tells a coherent story, which I enjoy a lot – to try to organise things into a coherent story. That requires perhaps reformulating things – I mean this is a maths thing. In maths, you can say things in many different ways, and the way you say one thing depends on the way you want to say the next thing, as well. So I enjoy this activity of organizing material a lot and put some effort into it.



Interviewer: So this was about getting new topics, but where do you get new ideas for how to present the stuff? I know that you have this tool for doing presentations so maybe you could . . .

Bojańczyk: I don't use it. I don't use it in teaching. I tried once, but the students didn't want it. And I try to use the blackboard. That requires no new presentation ideas; it just requires putting the material in the right order.

Interviewer: Which type or technique of teaching is most effective for you? And which technique do you use most?

Bojańczyk: For the lectures, I use the traditional technique of just standing at the blackboard. For tutorials, the traditional method in Poland is that the teacher is in front of the blackboard and then writes exercises, and the students approach the blackboard and try to solve them. So, you propose an exercise, then some student, maybe the best student, will have an idea and will come and will solve it on the blackboard.

Interviewer: OK, and now there will be some questions about opinions. Could you please complete the following sentence: "Good teaching for you is . . ."?

Bojańczyk: Effective teaching?! I don't know. I'm not going to answer the question in the format that you have asked for, which is probably bad for you, but I will say something nonetheless [interviewer laughs]. I will tell you a story. I had a maths teacher in high school, who I think was a professor – he's still maybe a professor in my department. For high school teachers it's unusual, so he was overqualified for the job of a high school teacher. And his goals were that his students were very good – for example, to be good at Olympiads, which are popular in Poland. So, he would say that in order to have any success in maths you would have to do 30 exercises a day. So, he was an effective teacher, I guess, but I was very discouraged by him. And I came to the conclusion that I don't like maths, because he gave the impression that maths is a mechanical skill, like running through hurdles, that you perfect through practice and measure by speed, or something like the grades you get in the Olympiads. And that is not good. And I think that to study math – and I say math because this is essentially what I do – is a wonderful spiritual experience, to learn things and to try to think critically, which you don't get to do so much outside in the business world, I guess. And I tell this story, because I answered that you have to be an effective teacher. You don't have to be effective in the sense that you get good scores, but rather somehow to give this spiritual experience of maths.

Interviewer: Yeah. Can you share a story of a moment that you encountered during teaching – so, I think you already offered some stories, but maybe there's one particularly nice – or not so nice – story?

Bojańczyk: I can't tell it as a story, so it's not going to be a story. . . . I should be able to, but I won't. What I find appealing is how I observe the ranking of students change. So, in maths, people are competitive, as you know, and there is always some kind of ranking of star students. And this changes. It's very common that you have a student that is the best Olympiad problem solver in the first year, and everybody's afraid of this student, and then somehow nothing comes out of this student by the fifth year. And, conversely, people who turn out to be very creative did not have such a strong opinion at the beginning. And there's an entrance exam to our department, so I was admitted – I was not admitted actually, I failed it – but then somebody resigned, so I think I was admitted in last place or second to last place, so I was also stressed by that. Because they were obviously great guys. And the first class was in discrete maths, so the teacher started by asking, "Tell me how many permutations there are of an n-element set?" So it's n factorial. "How many ways can you prove this?" And the same person was giving the answers all the time, and I thought "ahh, what a genius!" And then nothing happened with this guy. I don't know, maybe it's just bitterness that I am happy he failed, but I think he actually was a bit crazy. My conjecture is also that he was highly schooled in solving exercises quickly, but when it came to understanding material on a deeper level he didn't manage to work so well.

Interviewer: Thanks! Now there are some more general questions again. So, what do you think the main task of university education is?

Bojańczyk: I think that it is to develop people spiritually.

Interviewer: What is more fun for you, theoretical courses or practical courses?

Bojańczyk: I am a theoretician. I did try to do some practical courses, and they were very stressful for me because I didn't know anything – I knew very little. When you do theoretical courses, you have a competitive advantage over students in that you speak the language of theory; they don't. When you do practice, you don't have that, so you cannot coast with this advantage. I enjoyed it a lot, especially since it was 'humbling' experience. It shows you how the students are really. If you go outside your comfort zone and stop teaching your usual topics, and you instead teach something that you've been doing for two years that they've been doing for one, then you realise that it's not the students that are stupid, it's just that the material is difficult.

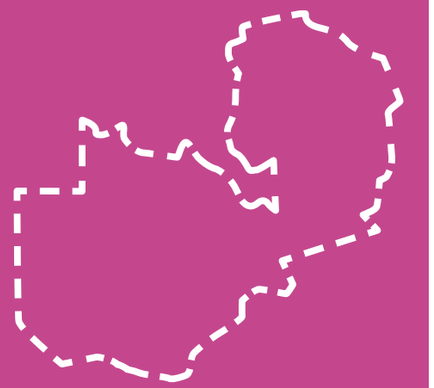
Interviewer: I can imagine that.

Bojańczyk: . . . the thing that happens to you is that you do the same course every year, and you start to think that the students are stupider and stupider.

Interviewer: What do you think is most advantageous for students: independent learning or a strict schedule?

Bojańczyk: I think it's kind of nice to give students freedom. It's true that often they don't do anything as a result, and it's also true that often you claim you want to give them freedom, when in fact you're too lazy to give them assignments. But the end result is that I like to give the freedom. Is that a good choice? And are the motivations benign? I don't know, but that's what I would tend towards, less supervision.

REPUBLIC OF ZAMBIA



In Zambia, higher education is centrally organized but also highly privatized. There are different statutory bodies, such as the Ministry of Education, which is responsible for public higher education institutes, the central Examination Council, and the Technical Education and Vocation Training Authority, which is responsible for the broad vocational training sector. Students typically finish upper secondary school with a national examination at age 19, which qualifies for tertiary education. At the higher education institutions, diverse study programs with varying lengths and awarded degrees are available (SARUA 2017).

In Zambia, the government expenditure on education in general was 1.1% of Zambia's GDP in 2008. When looking at research and development expenditures, the gross domestic expenditure was about 0.3%, which was primarily spent in the sector of higher education (78%), and to a lower extent in government, business enterprises, and private non-profit organizations. The gross domestic expenditure on research and development, therefore, primarily stemmed from governmental funds (95%) (UNESCO Institute for Statistics 2017).

Currently, there are 78 Zambian universities, colleges, and further higher education institutes (e.g., in the sector of nursing). The Mulungushi University is one out of three public universities (SARUA 2017). No university in the Republic of Zambia is listed in the Times Higher Education ranking 2016-17 (Times Higher Education 2016).

In 2008, most researchers were employed in the higher education sector (60%), followed by the sectors of government (32%), business enterprises (6%), and private non-profit organizations (2%). 31% of the researchers were females (UNESCO Institute for Statistics 2017).

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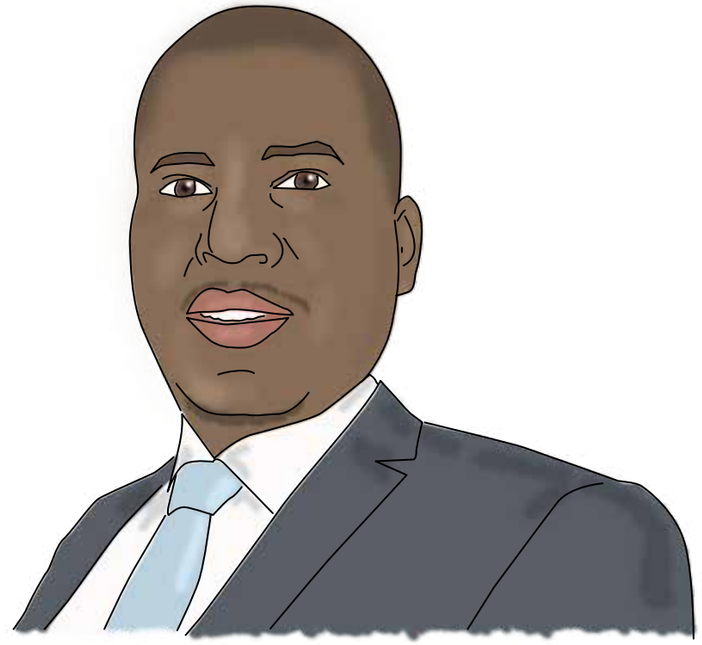
Zambia		Year
Gross domestic expenditure on research and development as percentage of GDP	0.28%	2008
Gross domestic expenditure on research and development by higher education sector	78.17%	2008

Isa Steinmann & Rolf Strietholt

CHERA E. DERESSA



Position: Head of the Department for Business Studies

Institution / Country: Mulungushi University, Kabwe, Zambia

Subject: Business

Teaching time: 11 years

Teaching load: 6 hours per week (+ 3 hours of tutorial)

Teaching Bachelor / Master / Graduates: Undergraduate and postgraduate courses

Interviewer: Pascal Malkemper

Interviewer: Would you say that you are happy with the prestige that you get as a teacher, as a university teacher, in Zambia?

Deressa: Yes, here academia is very [well] recognised. Our inputs are very valued. We usually take part in a number of policy-making, consultative meetings with government, private sector, and professional bodies. From time to time they do invite us to work with them. So, I think it's a well understood sector.

Interviewer: What do you expect from your students?

Deressa: What I mostly expect from my students is commitment to hard work, and I always expect them to be ready any time for any kind of assignments or exercises. I also expect them to be confident.

Interviewer: And how do you motivate them, to be like you want them to?

Deressa: I motivate my students by showing them some videos. I bring in some motivational speakers and also take them for industry tours (such as to the stock markets) for them to appreciate what awaits them out there. I also provide them with up-to-date journals. I subscribe to so many professional bodies in my field, so I give them [to the students] to demonstrate how others are succeeding, what they are doing. There are also some competitions, at the national, regional, and international level, in which I encourage them to take part that keeps them very motivated. I look for internships for them, so that they are geared for more hard work. As a reward, I help them with good recommendation letters that have helped some of my students get good jobs. And every year at the graduation ceremony, I source different types of prizes for from industry.

Interviewer: Do many of you your students get prizes?

Deressa: They do. At every graduation, we give prizes to about 5 or 6 students.

Interviewer: How do you motivate yourself? Why do you teach, in one sentence?

Deressa: Well I got interested when I was an undergraduate student. I started by helping my fellow weaker students when I was at the undergraduate level, and that is how I went into this profession. Since then it has been my passion, absolutely my passion. You know, teaching gives you greater pleasure and satisfaction, moulding someone and making them acquire knowledge in life is the biggest reward you can get as a lecturer or as a teacher. So it's a greatly rewarding profession.

Interviewer: Where do you get new ideas for your lectures? Do you have specific people, events, places, or lectures from your time as a student that give you new ideas for your own lectures?

Deressa: I subscribe to Pearson Education. I also get journals every month from the American Accounting Association, as well as the American Institute of Certified Public Accountants. I do attend a number of webinars online, where new cases are being discussed. That's where I mostly find new ideas, new cases, and issues that have to really be discussed in class.

Interviewer: So you use the internet very much for your teaching or for the preparation of your teaching?

CITATIONS

"What I mostly expect from my students is commitment to hard work."
"It's very strict, and the students are very, very respectful of their lecturers."

Deressa: Excessively. Yes. I have a dedicated internet access 24/7.

Interviewer: Which type or technique of teaching is the most effective? Is it the typical lecture or more a mixture of seminars and practical courses, what would you say?

Deressa: My lectures, in most cases, are mixed. At times when I do lectures, there are times when we just do exercises, we do case studies. There are times when students give presentations, they are given cases, and they work as a group. There are also online activities on the Moodle system. There is a course that requires practice in the computer lab.

Interviewer: Oh, Moodle, great. So you use e-learning techniques with your students?

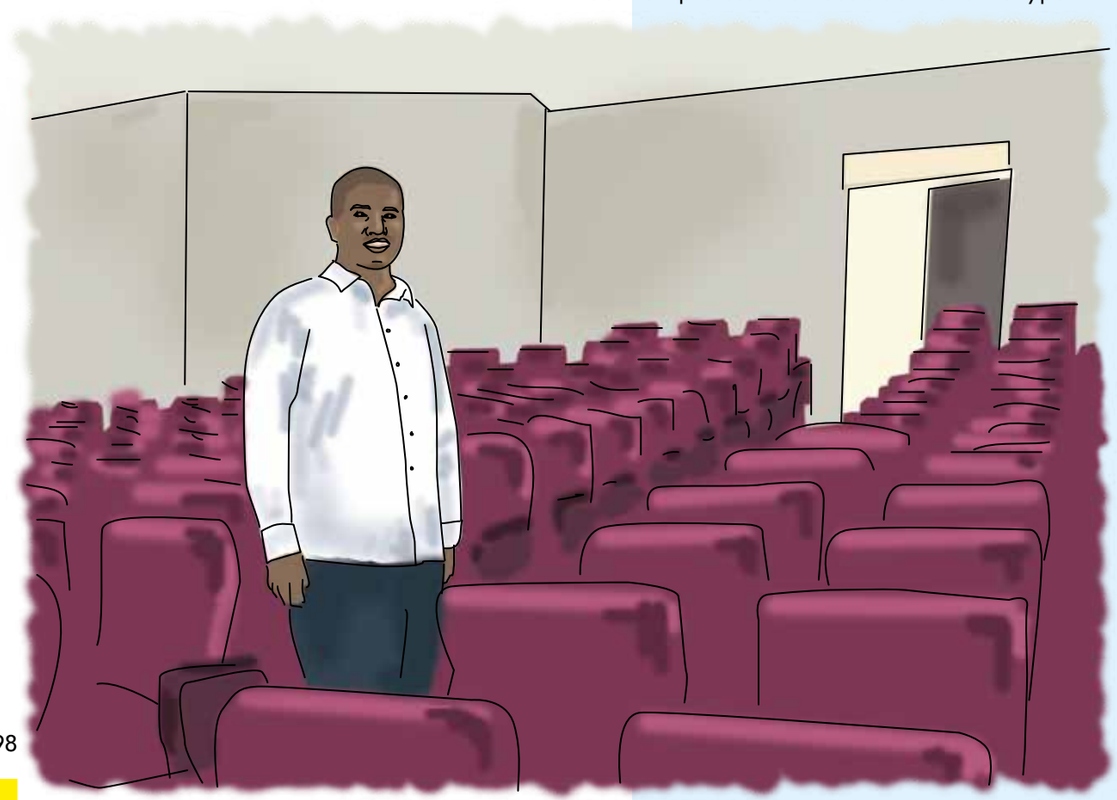
Deressa: Exactly.

Interviewer: When you came to your university, when you started teaching there, did you bring big changes to your university? Was there something you changed?

Deressa: You know; this university was one year old when I joined.

Interviewer: Oh! So you basically founded everything there. [laughs]

Deressa: Basically, starting from the curriculum, the teaching, the preparations of the modules, we almost started from scratch. This is my seventh year with this university. We have tried to do an integration with professional associations. I don't know if you've heard of the Association of Chartered Accountants, ACCA? We have managed to get an accreditation of our program so that when the students graduate, they just do their professional level. So that's the type



of work we have done. The institutions are satisfied with the content and the examination standards. This way we produce graduates who will easily become professionals that could meet the labour market needs.

Interviewer: From your eleven years that you've worked at universities now, is there any story that comes to your mind that was funny or interesting, any moment from your teaching experience?

Deressa: Uh, funny moments . . . well, our students are very respectful, the culture here . . . you don't really see funny things from students. They are very well disciplined in class. So you rarely have such kinds of things. It's very strict, and the students are very, very respectful of their lecturers.

Interviewer: What would you say, as a philosophical question, what's the most important thing that university education should give the students?

Deressa: Three things: knowledge, up-to-date knowledge, skills required for them to fit into any organisation, and of course the right attitude. Yeah, this is the very thing. Why am I saying up-to-date knowledge? This generation that's coming up is highly tech-dependent. We have got a curriculum that is built from theories that have been developed many, many years back, which are not recognising the recent phenomena, you know. So for me it's always very important that students have up-to-date knowledge, which will make them fit into the industry, which is slightly out of touch with the academia now. Technology moves at a fast pace, and we are following at a very slow pace.

Interviewer: So where do you see teaching in 20-30 years? Do you see any big changes happening?

Deressa: Absolutely, we have to revolutionise the way we are teaching because, at the moment, we teach students what we know, and what we want them to learn, not what they want to learn. We rarely engage students to give us what they expect. Most of them may not exactly or precisely tell you what their expectations are. That's the way we need to [do it]. The classroom environment itself, the teaching style, the approach, the delivery model, somehow has to be enhanced, or improved, for that we embrace technological change in the various disciplines. For us, for accounting students, we introduce them to the computerised accounting system in the final year, because that's what awaits them in the world of work – they are not going to do anything manually. Future jobs are tech based, and we need to start adjusting our curriculum to embrace technological requirements.

Interviewer: Do you have any good advice for new teachers?

Deressa: As advice to my fellow teachers, we are role models for the future generations. As such, we must exhibit a high-level commitment and be responsible for students that pass through our hand. In addition, we have to play a key role in mentoring upcoming academics from among our students with such potential. For example, at the moment I have a staff development fellow whom I am grooming. We are sending him in for advanced training, and he is always in class with me. He sits in my class, yes, and also I give him a responsibility to conduct tutorial classes in my presence. He has to teach. He has to demonstrate to students, do exercises with them. That's how I am trying to mould him to become a good lecturer.

BAD TEACHING IS?

Watanabe: If you try to teach everything that is in the textbook, it's too much.

Muheim: . . . is teaching at a level way above the level of the students and not asking any questions and not asking them whether they understand it.

Deressa: Is self-centred, obviously. You talk to yourself.

Painter: Bad teaching is lecturing the students!

Aldridge: It's basically learning material without understanding it.

Phillips: Bad teaching is monotonous repetition of textbook material.

Hackländer: . . . happening.

Frerich: The worst teacher is someone who made up their mind a long time ago, keeps strictly to this one opinion, and is trying to persuade everyone else of this opinion.

Lindner: Being chaotic, not prepared, doing something that is not at all on the level of the student, just keeping to your book, not considering the interest of the student.

Anderson: The number one worst thing you can say about any teacher is that you'll love him, you'll get an A, but you won't learn anything.

Lange: Bad teaching is no interaction, not updating your stuff, not making use of the technical possibilities that you have, not responding to, or caring about, what the students think.

Krans: I don't know if there is such thing as bad teaching. But I think it is not taking responses from the students seriously.

SOUTH AFRICA

Higher education in South Africa is governed by the Department of Higher Education and Training, and additional departments in the nine provinces The South African Qualifications Authority sets the framework for higher education, but, apart from that, the universities are highly autonomous. Students qualify for higher education with a secondary school matriculation certification, typically when they are 19. The study programs and awarded degrees follow the National Qualifications Framework (NQF). NQF 5 is the degree after one year of higher education, followed by the second year diploma (NQF 6), the third year degree (NQF 7), and, respectively, the honours degree in year four (NQF 8). The consecutive Master's studies reflect NQF 9 and typically take between one and two years, and the PhD studies reflect NQF 10 and typically take between three and five years (DHET 2017).

On education in general, the South African government spends about 6% of its GDP which amounts to almost 20% of the total government expenditure. However, in comparison to Germany, the expenditure per student in tertiary education is, with less than 5,000 PPP$, far lower. The gross domestic expenditure on research and development amounts to about 0.7% of South Africa's GDP, while almost one-third of it is spent in the higher education sector (UNESCO Institute for Statistics 2017).

Less than every fifth person in the tertiary school age population is enrolled in higher education. More females (23%) than males are enrolled (16%). The ISCED level 6 and 7 first degree graduation ratio is about 8% in general, with females being slightly overrepresented, too (10% of females and 6% of males) (UNESCO Institute for Statistics 2017). There are eight South African universities of technology, which are more vocationally oriented, 11 traditional universities, six comprehensive universities, and diverse private universities and colleges. Two universities are listed in the top 200 of the Times Higher Education ranking 2016-17. The University of Cape Town scores the highest with a rank of 148. The University of the Western Cape scores in the 601+ range (Times Higher Education 2016).

In comparison to other countries, females are quite equally represented in the South African research area: 43% of all researchers were female in 2012. Most researchers were employed in the sectors of higher education (78%), followed by business enterprises (14%), government, and private non-profit organizations (UNESCO Institute for Statistics 2017).

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South Africa		Year
Expenditure per student in tertiary education	4,882 PPP$	2014
Gross domestic expenditure on research and development as percentage of GDP	0.73%	2012
Gross domestic expenditure on research and development by higher education sector	30.72%	2012
Gross enrolment ratio in tertiary education	19.38%	2014
Gross graduation ratio (ISCED 6 and 7, first degrees)	7.99%	2014

Isa Steinmann & Rolf Strietholt

IRIS VERNEKOHL

Interviewer: Carsten Brenner

Position: Lecturer

Institution / Country: South African German Centre for Development Research and Institute for Social Development, Economics and Management Faculty, University of the Western Cape, South Africa

Subject: Development Economics and Management

Teaching time: 2009-2013 in South Africa, total > 10 years

Teaching load: 150h/a, 3 block courses 50h each

Teaching Bachelor / Master / Graduates: Master

Teaching methods: Various media (video, documentaries, Powerpoint), case studies, role-playing

SOUTH AFRICA

Interviewer: What would you say about the status and prestige of teaching in South Africa?

Vernekohl: Given that lecturers at many South African universities still often come from formerly advantaged groups, and because of the enduring legacy of the Apartheid system, I think the status as such might be considered to be quite high. But as the job is not very well paid compared to jobs in the private sector, once people figure out that it is not a very well paid job, it's not yet a competitive professional option. And status, in terms of financial status, is quite important in South Africa, especially for certain segments of the population, which is understandable given that South Africa is a country with one of the highest income disparities and poverty levels in the world.

Interviewer: How well perceived is teaching in comparison to research?

Vernekohl: Actually, at the times while I was working in South Africa, teaching and research were often not really interrelated. So many people simply taught and did not engage in research at all. On the other hand, there are also research professorships, which do not include teaching but are merely focused on conducting research and supervising theses. But, currently, that is changing very much in South Africa, because research and research-informed teaching are becoming more and more important, not only at the institutional level but also as part of the national higher education policy framework in South Africa.

Interviewer: Do you think a professor is a reputable profession?

CITATIONS

[The students] often expect the teachers to have "the" answer to a problem. The idea that there is not only one "correct" answer but that there might be multiple or alternative solutions to a problem – or even that there might not be a certain answer at all – is something that can confuse them deeply.

I think that online, virtual collaboration becomes more and more important, but I think it cannot fully substitute normal, face-to-face lecturing, so blended learning will probably become the standard.

Vernekohl: I think it is, but not in monetary terms. And I think for a system in which certain groups of people are really struggling financially and need a certain income that's actually a problem; even more so as graduates (already at Honours and Masters level) from formerly disadvantaged groups are immediately absorbed by the private sector labour market where you earn many times more than you do as a university professor. This means for universities that the pool from which qualified academic staff can be sourced is quite small and that not enough PhDs are produced in South Africa, which is why the Department for Science and Technology has recently started a major national programme to change that profoundly.

Interviewer: OK. Coming to the students – usually they expect that you are well prepared – what do you expect from the students during the courses?

Vernekohl: What I often encountered in the past is that students, particularly from developing countries, but also from Germany, if they take part in courses that are given by German or European universities, they expect the teachers to have the one and only answer to a question. The idea that there is not only one "correct" answer but that there might be multiple or alternative solutions to a problem – or even that there might not be a certain answer at all – is something that could confuse them deeply. And that can become quite difficult in an intercultural context – when the students actually might perceive you as not being competent because you do not have the one correct answer [laughs]. But that depends very much on the learning culture students come from and were socialised in; it is not that typical in the South African learning and academic culture.

Interviewer: How do you motivate students?

Vernekohl: I think generally they are very motivated because, in the program together with the Ruhr-Universität Bochum, we accept a maximum of only 25 people, who were selected from 500-700 applicants worldwide and based on very rigorous selection criteria. In the other UWC program, though, many students also have to work and earn a living—not only for themselves but also for their families – besides studying, and others also don't have enough to eat and they starve, which not only severely limits one's time available for studying but also very much inhibits one's cognitive skills, obviously.

Interviewer: Is it normal there to visit other lectures as a lecturer?

Vernekohl: What I found extremely helpful was co-teaching; it does not mean one teaches open lectures, but you really co-teach together. So you are in the class together, you prepare the class together, the whole courses together. I was working together with a political scientist and a social scientist, both from Germany as well as from South Africa, so it was not only international but also interdisciplinary co-teaching and it was very, very interesting. It was fascinating to observe the difference in teaching styles, how these differences in teaching styles were perceived by the students, and to get direct feedback from your peers, which is extremely helpful.

Interviewer: Which type or technique of teaching is the most effective, or what technique do you use most?

Vernekohl: I actually think there's no one superior teaching technique, I think it's all in the right mix and that it needs to be explicitly geared towards the specific composition of the group of students that you are interacting with at a given moment in time.

Interviewer: Have you brought changes to teaching at that university?

Vernekohl: Yes, because, in the "MA in Development Management" Program, we very much rely on (real world) case studies and role-playing – a method that was not common in the other programs at the UWC at that time.

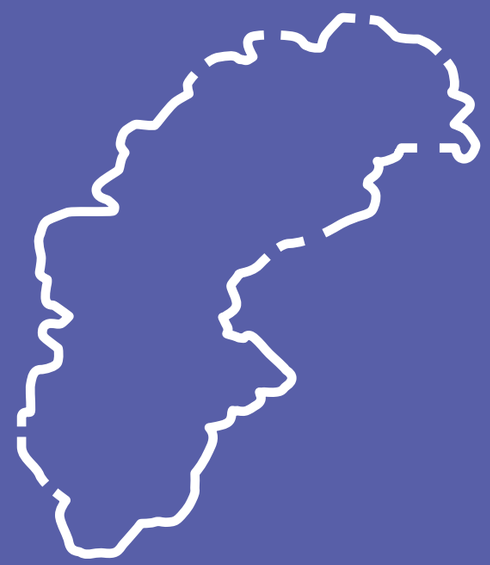
Interviewer: OK, can you share a story of a special moment that you had during teaching?

Vernekohl: At the beginning, what surprised me most during the lecture was that, when I used common economic expressions, like "shadow economy" – which is a land expression – or "black market," then I would get quite strong reactions from some segment of the students in the course, accusing me of being a racist, because why is the informal market also called a shadow or a dark economy, and why is the Schwarzmarkt [black market] called a "black" market. So that was really shocking, because I did not really see that coming the first time. From that day onwards, I was really taking care to put the words into context and to pay explicit attention to intercultural sensitivities that might exist within the course. What was also interesting is that this strong reaction from the students was exclusively coming from the South African students and not from African students coming from other countries in Sub-Saharan Africa; so, I guess, it might be related to the sensitivities that developed during – and are still prevalent due to – the former Apartheid System in South Africa.

Interviewer: Where do you see teaching at the university level in 20-30 years?

Vernekohl: I think that online, virtual collaboration is becoming more and more important, but I think it cannot fully substitute normal, face-to-face lecturing, so blended learning will probably become the standard. First studies done on that topic actually revealed clearly that the learning effect is much better if you have it blended than to just have it online.

Interviewer: OK, then thanks a lot.



SWEDEN

As an EU country, Sweden belongs to the European Higher Education Area and, for example, participates in the Bologna process and the ERASMUS+ program. Although the Swedish education system is basically rather decentralized, the higher education system lies primarily under the responsibility of the Ministry of Education and Research.

Students typically finish upper secondary education when they are 19 years old. In Sweden, there is no final examination of upper secondary school, but there are preparatory courses for (vocational) higher education. The resulting preparatory diplomas serve as qualifications to enroll in tertiary education. In case there are more applicants than available places in a specific program, further criteria have to be met. Tertiary education institutions are public Universiteten (universities), Högskolorna (university colleges), and private institutions, which in some cases receive financial support from public funds. Yrkeshögskola (higher vocational education) can also be provided by, for example, municipalities. First- and second-cycle studies are offered at Universiteten and Högskolorna and are scheduled to three and two consecutive years. There are also higher vocational studies at these institutions, as well as at Yrkeshögskolorna, which typically take two years, and further subject-specific long-study (e.g., medicine) and short-study programs (e.g., dental hygienist). Doctoral studies are scheduled to four years (EURYDICE 2017).

With almost 19,500 PPP$, the expenditure per student in tertiary education is higher than in Germany. The gross domestic expenditure on research and development amounts to more than 3% of Sweden's GDP, with 29% being spent in the sector of higher education, two-thirds in business enterprises, and only a small proportion in the sectors of government and private non-profit organizations (UNESCO Institute for Statistics 2017). There are no tuition fees for students from Sweden or other EU countries. However, in certain joint or multiple degree programs, fees can be charged. There are grants for all full-time students for six years, as well as additional loans. Under some circumstances, students can also apply for further grants, for example, if they have children. The students' families cannot apply for family allowances, and there are no tax benefits (European Commission/EACEA/EURYDICE 2016).

The enrolment ratio of the tertiary school-age population is 62%, with many more females being enrolled (76%) than males (49%). Almost one-third of the school-age population graduates with first degrees in Bachelor and Master equivalents. Here, the proportion of females is also higher (45%) than the ratio of males (23%) (UNESCO Institute for Statistics 2017). Next to 14 state universities, there are 17 state university colleges, and further higher education institutions (EURYDICE 2017). Six Swedish institutions are ranked in the top 200 of the Times Higher Education ranking with the Karolinska Institute scoring the highest (ranked 28). The Lund University scores with place of 96 among the top 100 (Times Higher Education 2016).

More than 40% of all researchers are employed in the sector of tertiary education, about one half in business enterprises, and about 10% in government and private non-profit organizations. One third of all researchers are female (UNESCO Institute for Statistics 2017).

Sweden		Year
Expenditure per student in tertiary education	19,394 PPP$	2013
Gross domestic expenditure on research and development as percentage of GDP	3.10%	2014
Gross domestic expenditure on research and development by higher education sector	28.97%	2014
Gross enrolment ratio in tertiary education	62.35%	2014
Gross graduation ratio (ISCED 6 and 7, first degrees)	33.47%	2012

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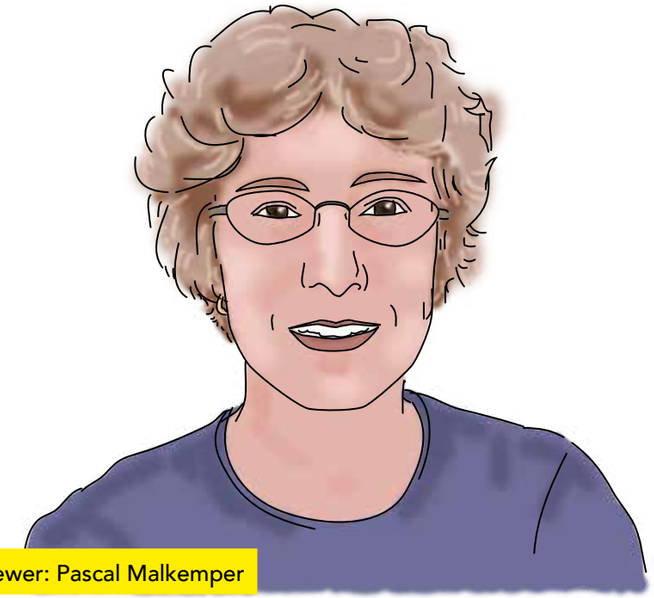
Isa Steinmann & Rolf Strietholt

RACHEL MUHEIM



Interviewer: Pascal Malkemper

Position: (comparable to) Associate Professor

Institution / Country: Lund University, Lund, Sweden

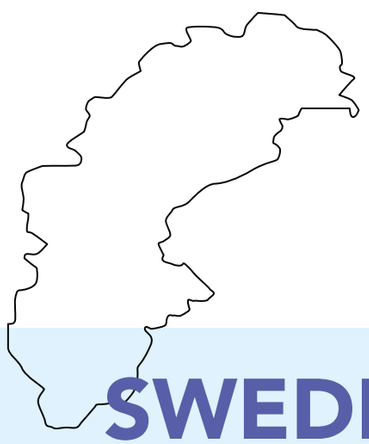
Subject: Biology

Teaching time : Since 2008

Teaching load: 20% teaching, 20-30% administration

Teaching Bachelor / Master / Graduates: Bachelors (entry-level zoology), Masters, and one PhD level teaching every two years

Teaching methods: Writing Wikipedia pages



SWEDEN

Interviewer: What's your position at the university?

Muheim: It's a so-called permanent position, but it's only permanent as long as I have my own research money and can pay 50% of my salary, more or less.

Interviewer: What about the prestige that you get when you are teaching in your country?

Muheim: Could be better. . . . It's valued on the department level, but it's nothing that you can compete for, like to get research grants or to survive your career here. When I apply for research money, they don't look at how much I have taught, they only look at the research output. So teaching doesn't really help towards getting permanent positions in academia. It's very low rated, even though they always say it should be counted 50-50; that's what politicians want, but we've just not come that far, by far. For my immediate future, it doesn't count too much. If I wanted to change to other universities, then it would become important I am sure.

Interviewer: How well are professors seen by the people outside of university?

Muheim: It's too hard to say. Not like teachers, because teachers don't have a very high reputation. That's why Sweden in all these comparisons between educations has recently not been doing very well. But I don't know – our status in Sweden is not really talked about much.

Interviewer: Alright, let's turn to the students a bit more. Of course, the students will expect from you that you are well prepared and, of course, open for questions. What do you, on the other hand, expect from your students?

Muheim: I expect them to be there, to listen and to think, and not just expect us to present everything to them but actually also to be interactive and participate and ask questions.

Interviewer: Is there any specific thing that you do to motivate them?

Muheim: We have a lot of practicals, which I do not do, but our PhD students usually give them. There's a lot of practical interactions; they have to look at specimens and really have to apply what they have learned during the lectures. When it comes to lectures, I try to have the lectures given as interactively as possible, which is always a little bit difficult for undergraduates because then you can only say half of what you are supposed to say.

CITATIONS

The Swedish system is quite different from the Swiss, at least, that's the one I know, where students are more encouraged to not just learn everything by heart but to understand the subject matter, rather than just pressing it into their heads and then forgetting it.

Different students learn in different ways, and we as teachers can adapt to that.

Take [teaching] step by step, don't be disappointed if the first lectures don't turn out the way they should, but just keep improving them until you come to a stage where you feel confident about what you teach.

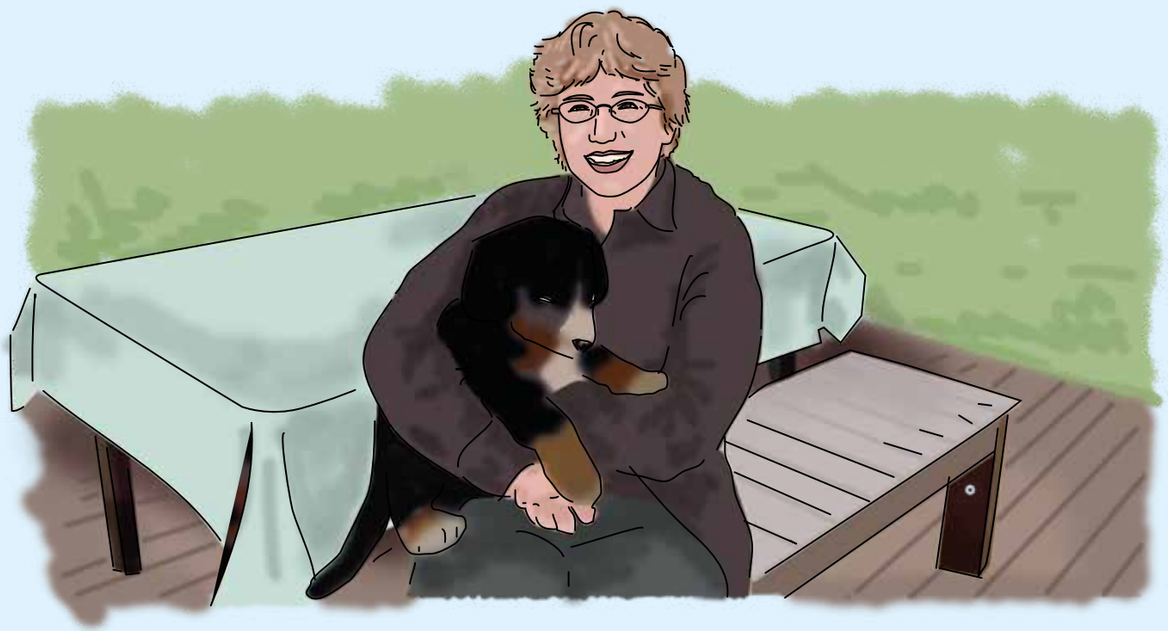
The Swedish system is quite different to the Swiss, at least, that's the one I know, where students are more encouraged to not just learn everything by heart but to understand the subject matter, rather than just pressing it into their heads and then forgetting it.

Interviewer: What do you think would be the most effective type of teaching?

Muheim: The classical way of teaching, I guess. I don't know if they will learn most that way, but at least you get the most facts to them.

Interviewer: Did you bring any new techniques or anything that was particular to your teaching?

Muheim: I kind of took over other people's lectures and then gradually turned them into mine, so I don't know whether it is my own. I have to take at least five weeks of teaching training courses, so I had to take theoretical courses, and learning and teaching in higher education, with all the different teaching models and learning theories that exist.



Interviewer: And would you say that that helped you? Would you advise young teachers to do that?

Muheim: Yeah, I think it was a little bit too much, but I think they help to really get a deeper understanding of how differently students learn. Different students learn in different ways, and we as teachers can adapt to that. Some students like to read more, and others need to discuss stuff with their colleagues. So just being aware of things like this is helpful to kind of design the courses in a way that gives everybody the opportunity to learn in their way. And there are so many students with different backgrounds, how do you find the level that is appropriate for at least most of them?

Interviewer: So, was there a mistake, maybe, that you made in the beginning that you've learned from?

Muheim: There were many [laughs] yeah. . . . Take it step by step. Don't be disappointed if the first lectures don't turn out the way they should, but just keep improving them until you come to a stage where you feel confident about what you teach, because very often it's not really the specific area you research in.

Interviewer: So, just maybe please complete the sentence "Good teaching . . ."?

Muheim: . . . adapts the teaching level to the students and interacts during teaching.

Interviewer: And "bad teaching is . . ."? or "the worst teaching is . . ."?

Muheim: The worst teaching . . . is teaching at a level way above the level of the students and doesn't ask any questions and doesn't ask them whether they understand.

Interviewer: In one sentence, why do you teach? Honestly. [both laugh]

Muheim: I like it, because you can interact with students and get to know the new generation of potential scientist of the future.

Interviewer: OK, but isn't it boring to teach the same things over and over again?

Muheim: Well, I always learn myself. Every time I have to redo the same lecture, I usually try to find something new or update myself, and I think it also keeps me up-to-date.

Interviewer: So, a more philosophical question – what would you say is the main task of university education?

Muheim: To advance knowledge and give it all to the younger generations, to teach them to think independently, and to develop all the tools they need for a good future.

Interviewer: What do you think will change in the next 20-30 years in the university teaching level? Will there be any big changes coming?

Muheim: Oh! I hope so, but I wouldn't know what they could be. I guess more interactive courses.

DO YOU HAVE AN ADVICE FOR BEGINNERS IN TEACHING?

Bojańczyk: I think it's an intuitive process.

Watanabe: What I do is the following: On the first day, I don't tell them anything about the real contents. I tell them what we are researching, or going to be researching, what the most difficult challenges are. It's very enjoyable. So that the first day they are just given the incentives or stimulation.

Vernekohl: I think trying to be self-confident, which also means that you are not shocked when people are not happy with how you teach, what you teach, or what you say. But also being self-reflective in that you've tried to find out what could be the issue, but not necessarily thinking that you are doing everything wrong.

Barceló: Be extremely well prepared, go over all details, don't leave any detail unattended [laughs]. Here, I'm talking about technical details; especially for people who teach theory, it's so important. If you don't understand all the details, then you don't understand.

Abe: I want the advice!

Muheim: Take it step by step. Don't be disappointed if the first lectures do not turn out the way they should, but just keep improving them until you come to a stage where you feel confident about what you teach, because very often it's not really the specific area you research in.

Painter: I think one of the most important things for a first-time teacher is really just getting confidence in the classroom. So, I think it's very easy for students to pick up on anxious teachers and people who aren't that confident in their teaching style or just teaching in general, or speaking publically.

Peres: Don't think you have to know everything. If you don't know something, just tell the students you don't know. And do your job – after the class research it, everything's fine.

Aldridge: There's no substitute for preparation. And the other thing is to try to enjoy it, because at the end of the day, again, that comes across if you're enthusiastic about what you do. People perceive that and take that on board.

Jaalouk: It is important for a new beginner not to have a psychological barrier to teaching. If they were to think of it as a burden, just try to embrace it. If it's difficult the first year, don't give up, just sail through it, try different things. It doesn't hurt, because not everything is going to work out well, especially not the first time. And eventually, each instructor, I do believe that, each instructor, sooner or later they will really find their equilibrium.

Phillips: I think it's good to teach about what you love in your own area, and to actually not avoid things you've done but to focus on them, how you did them and why you did them.

Hackländer: Go to didactic courses, because you learn a lot about perceptions, learning curves, and things about different methods in teaching. I would really encourage young teachers to be open-minded and to get some feedback directly from the students.

Lindner: I think it's very easy to be eaten up by your teaching, because if you want to be perfect you can spend all your time teaching. So, I think you need to find a good balance where you take it seriously, you prepare it well, but then also at some point you stop.

Frerich: It should not be regarded with disrespect if someone newly-started is searching for help, maybe even from the beginning, or looking for advice from somebody who has been in this job for quite some time.

Lange: Learn from very good models, I suppose that is one part. The second part, I think, is that you start off taking over parts of courses from somebody, from a senior lecturer, for example, not just the whole thing but maybe a bit, and just get acquainted and get used to it.

Krans: You have to be well prepared, so you have to know your topic really well. And also, try to put yourself in their shoes, to think about how it would be relevant to them and what you would want to know if you were them.

Isa Steinmann & Rolf Strietholt

The United Kingdom is part of the European Higher Education Area and the Bologna process towards comparability and coherence of higher education in Europe. It also participates in the EU ERASMUS+ program, which fosters internationalization and mobility and further established several national policies and programs. The United Kingdom of Great Britain and Northern Ireland refers to England, Scotland, Wales, and Northern Ireland. Higher education is overseen by the United Kingdom's Department for Education and regional governmental entities in Scotland (Scottish Funding Council), Wales (Welsh Government), and Northern Ireland (Department for Economy). The higher education institutions (various universities, colleges, and alternative providers) are subsidized government-dependent private bodies that are highly autonomous in determining admission, program, examination, and awarding conditions, as well as the structure of the academic year.

In all four parts of the UK, the university admission is organized somewhat independently, while a common framework ensures the comparability across the state. Generally, higher education entrance certificates can be taken at any age but typically, the so-called A-level (General Certificate of Education, Advanced)—which is the most common qualification for higher education—is taken at age 18 after 'sixth form' year of schools/colleges, or further education colleges. Higher education is structured in three consecutive cycles: Bachelor's (ISCED 6, typically three years in full-time), Master's (ISCED 7, typically two years in full-time), and doctoral studies (ISCED 8), even though there are additional short-cycle (ISCED 5, typically two years in full-time) and further programs, as well as certificates outside this Bachelor and Master structure (EURYDICE 2016a, 2016b, 2016c, 2016d).

United Kingdom		Year
Expenditure per student in tertiary education	14.913 PPP$	2014
Gross domestic expenditure on research and development as percentage of GDP	1.70%	2014
Gross domestic expenditure on research and development by higher education sector	26.12%	2014
Gross enrolment ratio in tertiary education	56.48%	2014
Gross graduation ratio (ISCED 6 and 7, first degrees)	52.67%	2014

UK

The government expenditure per student in tertiary education is—with about 15,000 PPP$—a little lower than in Germany. The gross domestic expenditure on research and development is less than 2% of the United Kingdom's GDP, while about one quarter is spent in the sector of higher education (UNESCO Institute for Statistics 2016). The enrolment in higher education requires the payment of tuition fees, which vary considerably depending on the parts of the United Kingdom, the study cycle, and individual university regulations. In England, there are no need-based grants but student loans are available, while in Wales, Scotland, and Northern Ireland both types of student support exist. However, the regulations, as well as amounts of money, vary distinctly (European Commission/EACEA/EURYDICE 2016).

The gross enrolment ratio of the tertiary school-age population is 57%, with a higher proportion of females (64%) than males being enrolled (49.0%). The gross graduation ratio for first Bachelor and Master degrees is just a little lower than the enrolment ratio (53%), with a comparable gender ratio (60% of females, 46% of males) (UNESCO Institute for Statistics 2016). 32 higher education institutions are ranked in the top 200 of the Times Higher Education World University rankings in 2016-17. The University of Oxford is ranked as the best university in the world (Times Higher Education 2016).

More than two-thirds of all researchers in the United Kingdom (71%) are employed in the higher education sector. 27% of researchers are further employed in the sector of business enterprises and only few in the sectors of government and private non-profit institutions. Almost 40% of all researchers are female (UNESCO Institute for Statistics 2016).

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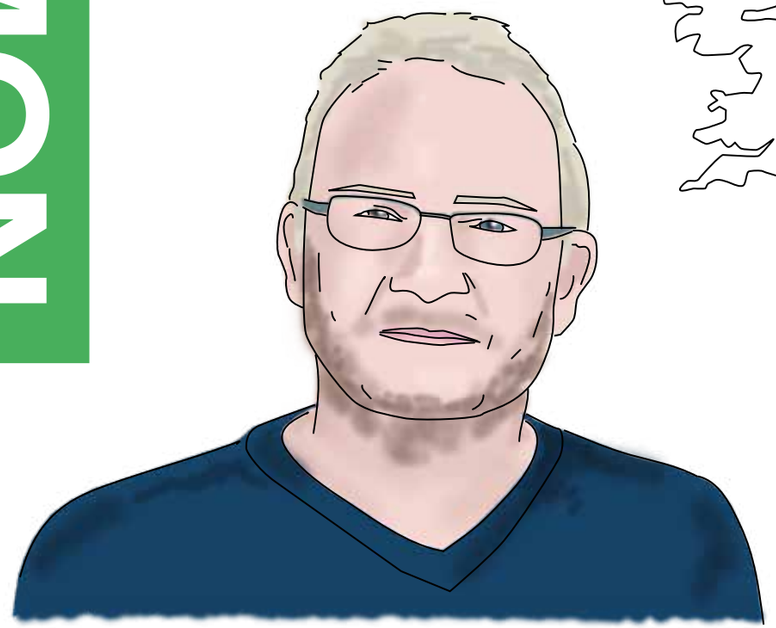
SIMON ALDRIDGE



Interviewer: Jochen Niemeyer

Position: Full Professor at University of Oxford, Fellow at Queen´s College

Institution: University of Oxford, England

Subject: Chemistry

Teaching time: 18 years, 10 years at Oxford

Teaching load: department 12 lectures, 20 hours in lab (per term); college: 6h/week

Interviewer: At your university, what is the approximate ratio of students to lecturers or professors?

Aldridge: In the chemistry course you're looking at about 10:1. It's a slightly unusual system, because of the college system. There's an emphasis on small group teaching but that requires a lot of resources in terms of faculty.

Interviewer: What types of courses do you offer? And maybe you can explain a little bit what is special about the college teaching?

Aldridge: So basically all of the students studying chemistry in Oxford study for the same course, so it's a four-year Master of Chemistry. The first three years of the teaching are based around lectures and small group tutorials, and exams to assess the students, and then in the final year they do a one-year project. So the first three years of the course, the lectures are run by the department, and the practicals are run by the department. Furthermore there are roughly 35 colleges within the University of Oxford, and the students are all a member of one of those colleges, and they get small group tutorial teaching in groups of two, maybe three, with a faculty member. This includes maybe two of those sessions a week, during the entire term.

Interviewer: How do the group tutorials work?

Aldridge: The students will be given, at the beginning of term, a series of worksheets. Each worksheet will have a reading list and a series of problems.

On a weekly basis they hand in their notes and answers to the problems and we meet for an hour to discuss everything. At the end of the session, usually I give them a set of follow-up problems, which are usually past-exam questions on the topic. A few days later I do a follow-up class on the same topic, but instead of a group of two it would be a group of six. They have to get up at the blackboard and to work through the problems, and I find that's a very useful way of trying to get people to take things in, if they've got to explain stuff to their peers and to me.

CITATIONS

Some students respond better to the carrot and others to the stick.

The tutorial teaching here, the university will absolutely, until it shuts, stick with that, because it's very intense but it is actually a good way of educating people.

There are very few places in the UK that operate this system. The University of Cambridge does something similar, Imperial College London a little bit as well, Durham University perhaps, but the limiting factor is resources. The way the finances work in Oxford in order to be able to do that is because part of my salary is paid by the colleges. And the colleges, some of which are very old, have income that's derived from other sources, and that feeds in. So in effect, the collegiate system, the colleges are actually subsidising the teaching of the undergrads.

Interviewer: So does your good teaching add to your prestige, or to your profile as a successful scientist?

Aldridge: I think within the university, what one's perception is, for example one's chance of promotion, is mostly determined by research.

The university does offer some awards for teaching excellence, but they're relatively few, and it is generally assumed that people will simply do their teaching at a good level – and that's a given – and then your research is almost determined how you get on.

Interviewer: And how do you assess the significance or importance of teaching?

Aldridge: I think it's very important. I mean ultimately a massive amount of output in terms of what the university produces is the people it produces. The future generations of chemists, in our case. So I think it's very, very important. Also, I do think most people here do put an enormous amount of effort into their teaching, I think people have a sort of self-motivational pride – people want to do it well.

Interviewer: Do you think putting effort into teaching and doing good teaching was important for your professional career?

Aldridge: I think, up to a point. Two things in particular: So one is that the senior tutor, who oversees academic matters within the college, has to write a letter in support of your application, and so you have to be doing good teaching in order to get that. The other thing they use a little bit is student feedback. Again, that feeds in. So yeah, it's not insignificant in terms of progressing through your career I think.

Interviewer: So talking a little bit about the students. Students would expect you to be well prepared and motivated to teach, in turn what do you expect from your students?

Aldridge: [Laughs] The same, I guess. For a tutorial, if they don't do the work, and don't hand it in, then the college will throw them out pretty quickly. Part of the reason is that the college is actually the organisation that accepts them. And the flip-side of that is that it is in the college's behest to kick them out. We have sessions at the end of each term where we basically tell them how we think they're doing, and they get online reports and all that. So I would expect that, they have to do all the work. You expect them to be able to stand up and be able to answer questions on the week's topic.

Interviewer: So if there's someone who lacks a certain motivation, is there a trick that you have to motivate people?

Aldridge: I think some students respond better to the carrot and others to the stick. One of the things I've found, the way I run small group tutorials is to get students up to the board and to reduce the amount of talking that I'm doing and increase the amount of talking that they're doing. They don't want to look like an idiot in front of their peers, and you can use that 'peer-pressure'. If you get some good students, it drags the rest of the cohort up. The dynamic within the group is actually quite important.

Interviewer: Do you think it becomes boring to teach the same things over and over again?

Aldridge: I think there are plusses and minuses to teaching the same material. Particularly with the more challenging things, you get better at doing that because you learn the material a bit better and you know what the awkward questions will be. One the other hand, if you're teaching stuff that you take for granted, I think there is a potential to get more stale. In that respect, you need to just alter the material a little bit. For example, a colleague and I took on a lecture course around three years ago and completely rewrote it. It's now just from the primary literature from the last 15 years, which is quite a nice way of keeping it fresh.

Interviewer: So does teaching increase your personal happiness?

Aldridge: [laughs] The answer to that question would depend on when you ask me. If you asked me that question on a Thursday night, having to mark a pile of questions for Friday's tutorial, I would say no. On the other hand, what I really like doing is the interaction with the students in the tutorial, actually teach them stuff and sharing things from a new angle – that can be extremely rewarding. If you asked me on a Friday afternoon, then yes.

Interviewer: What is "good teaching", in a short sentence?

Aldridge: Good teaching is ... essential [both laugh]. Good teaching is allowing students to think for themselves.

Interviewer: Going the other way – "Bad teaching is..."?

Aldridge: It's basically learning material without understanding it.

Interviewer: Is there any special moment or story that you will always remember from a teaching situation?

Aldridge: Going back to when I was a student the guy who taught me organic chemistry obviously put a lot of work into his tutorial questions. He was very clever, in that he picked examples that were always right on the borderline. And the reason was not necessarily to show that you got it right, it was to make you think about what the factors were that made it go one way or the other. And I've tried to take that on board in some respects, to set things that are on the borderline to make people think a little bit.

Interviewer: What do you think is the main task of university education?

Aldridge: I think, to produce people who can think, who can analyse a problem, across a broad spectrum of subjects. I think that's more important than the actual specifics of the subject. Teaching people how to analyse and come up with an answer to a problem.

Interviewer: OK, so where do you see university teaching in 20-30 years?

Aldridge: [laughs] Oxford will be the same as it was [both laugh]. The tutorial teaching here, the university will absolutely, until it shuts, stick with that, because it's very intense but it is actually a good way of educating people. I would like to see much more interdisciplinary nature to the teaching. I think that that is something that has to come, as the advances come from applying knowledge from this part to that part, and I think we need to be doing more of that with our students. I hope that's how it goes.

Interviewer: So last question – do you have any advice for beginners in teaching?

Aldridge: There's no substitute for preparation. If you turn up somewhere and you are not sure of the material, that will undeniably show through. And the other thing is to try to enjoy it because at the end of the day, again, that comes across, if you're enthusiastic about what you do. People perceive that, and take that on board.

Interviewer: Thank you!

WHAT IS THE MAIN TASK OF UNIVERSITY EDUCATION?

Vernekohl: I think it is assisting people in becoming responsible citizens and researchers, which it does not always fulfill very well.

Watanabe: For the undergraduate programs, I think, to educate generally. Also, we have to teach how to learn so that after they graduate they can do everything by themselves. We have to teach them how to learn, how to brush up their imagination. But for Master and PhD programmes, they must be specialist-like. Society or the public like to welcome our graduates as 'scientists', but they have to be well-trained.

Barceló: To form citizens – people who care about the needs of their society, who are very well prepared to do their job, people who think critically.

Muheim: To advance the knowledge and give it all to the younger generations, to teach them to think independently, and to develop all the tools they need for a good future.

Peres: I think it's forming people and citizens. In a broad sense.

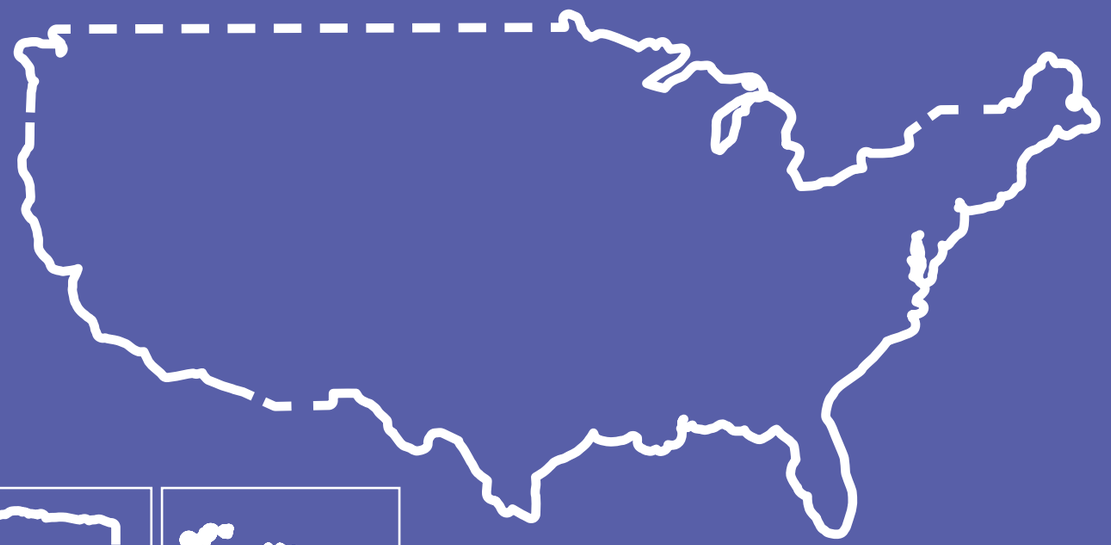
Painter: I think the main task is obviously to educate the students, but I think it's to, maybe, broaden the intellectual scope of every student at the university.

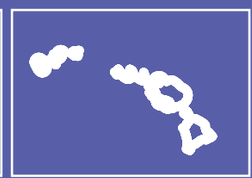
Aldridge: I think to produce people who can think, who can analyse a problem across a broad spectrum of subjects. I think that's more important than the actual specifics of the subject. Teaching people how to analyse and come up with an answer to a problem.

Lindner: It is to form people that can think independently, that can solve problems, that can use information and do something with it. So, I think that's something very general that you can learn at university, regardless of the topic that is being taught.

Frerich: University teaching should make sure that students take with them techniques of how to learn, how to memorise things, how to evaluate things.

Lange: We have a lot of discussion about that, whether it is about educating people for a job or if it is for your personal development, or whether it is to make you fit as a scientist. For me, personally, it's a combination of the three.





USA

In the United States of America, higher education is highly diverse and decentralized. The federal government, represented by the U.S. Department of Education, plays a limited role in administering education. The federal states, as well as local authorities have comparably autonomous power. Higher education implies all types of postsecondary education, which also implies vocational schools. The accredited institutions encompass degree-granting institutions, such as colleges, universities, and community colleges, as well as non-degree-granting institutions that provide specific professional training. They are often grouped following the Carnegie Classification, which captures the specificity of subjects, awarded degrees, and the intensity of research activities an institution provides.

Both public and private institutions offer diverse study subjects with varying program durations and awarded degrees (including Bachelor's, Master's and doctorates). The Bachelor's degree is the most common form of undergraduate degrees and typically takes four or more years of full-time study. At community colleges, associate degrees are most common, which often take two years of full-time study. The most commonly occurring subsequent graduate degree is the Master, which usually takes one to two years. Admission to higher education varies greatly from state to state and institution to institution, as well. Often, the results of standardized tests in secondary education (e.g., the Scholastic Aptitude Test), individual recommendation letters, student-written essays, or extracurricular activities are taken into account (USNEI 2017).

The government expenditure per student in tertiary education is, with 11,000 PPP$, low—in comparison to Germany—as well as the gross domestic expenditure on research and development. This is primarily spent in the sector of business enterprises (71%), to a lesser extent in the sector of higher education (14%) (UNESCO Institute for Statistics 2017). In contrast to private postsecondary education, the public sector is also funded by the government. However, student tuition fees play a major role in financing higher education in both cases (USNEI 2017).

As all types of postsecondary education are counted as higher education, the enrolment ratio is with 86% very high. Almost all females are enrolled in some kind of postsecondary study. However, the graduation ratio is, at 40%, less than half of the enrolment ratio. Almost every second female, and about every third male of tertiary school age graduates (UNESCO Institute for Statistics 2017). There are about 1,600 higher education institutions that do award associate degrees, and about 2,400 institutions that award Bachelor's or higher degrees. More than 400 of these also award research doctorates (USNEI 2017). The United States of America is, with 63, the country with the largest number of tertiary education institutions in the Times Higher Education ranking. The California Institute of Technology reaches the second rank, and the University of Maryland, College Park, the rank of 67 (Times Higher Education 2016).

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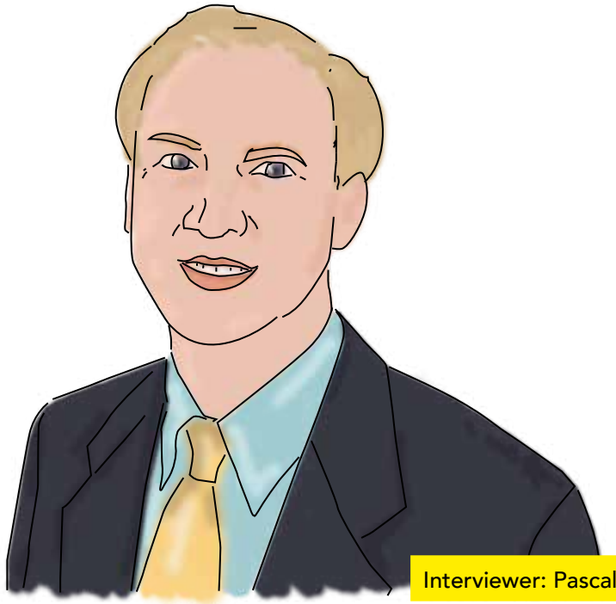
United States of America		Year
Expenditure per student in tertiary education	10,888 PPP$	2013
Gross domestic expenditure on research and development as percentage of GDP	2.73%	2013
Gross domestic expenditure on research and development by higher education sector	14.15%	2013
Gross enrolment ratio in tertiary education	85.80%	2015
Gross graduation ratio (ISCED 6 and 7, first degrees)	40.41%	2012

CHRIS ANDERSON



Interviewer: Pascal Malkemper

Position: Associate Professor

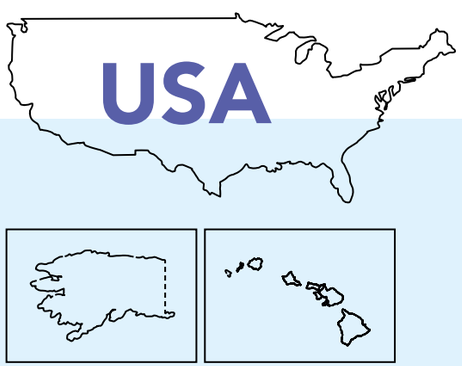
Institution / Country: US Naval Academy, Annapolis, USA

Subject: Electrical and computer engineering

Teaching time: 9 years

Teaching load: 10 contact hours per week

Teaching Bachelor / Master / Graduates: Bachelors



Interviewer: In terms of being a professor, would you say you are happy with the status and the prestige it gets, or that teaching gets, in your country?

Anderson: On the whole, I would say no. There are certainly a lot of benefits to being an educator; however, teaching as a general rule in the United States, I think . . . quality teaching tends to be undervalued. Being a quality researcher is much more highly-valued across the board than being a quality teacher.

Interviewer: So would you say you feel supported as an academic teacher?

Anderson: On the whole, not really. Most U.S. colleges and universities, even teaching-focused schools, actually emphasise research more than teaching. Relative to our size and constraints, in terms of being an undergraduates-only university, USNA is ostensibly a teaching-focussed university that's supposed to value excellence in teaching. But just like everywhere in the U.S., how do you measure someone's productivity, whether as an educator or a researcher? And that has crept into this idea of, let's look at how many papers they've published. The biggest hurdle to tenure is publishing high-quality journal papers. Promotion to full professor is less about publishing papers, but if you're not actively publishing journal papers in peer-reviewed international journals, you're not going to make full professor no matter how wonderful a teacher you are.

Interviewer: So to sum this up: do you think that being a professor in the United States or especially here is a reputable profession?

Anderson: It's still a very reputable position. I read a really interesting quote many years ago that has always resonated with me: "As a professor, you're paid in part by coolness." What I mean by that is the office, the ability to call yourself a professor, the ability to positively impact the lives and future of your students, and the ability to go and interact with the rest of your community in terms of conferences and travel.

Interviewer: What do you expect from your students?

Anderson: [laughs] I think that like professors everywhere, we expect the students to have read the textbook, or at least to have cracked the spine and scanned the material. If I could get at least that far, I would be thrilled.

Interviewer: So, about your personal motivation then. Isn't it boring to teach the same things over and over again? How do you keep your own enthusiasm?

Anderson: So, there's a couple of things. One is that it's nice to rotate through courses. It keeps me fresh. It keeps the course fresh. But you can overdo that, too, if you're trying to change the course every single year, all of a sudden you're just going to exhaust yourself – yes, the course is going to be fresh and it's going to be entertaining but you're going to be exhausted. And I love seeing the "lightbulb moment" in my students – that point when, to use a cliché, the lightbulb turns on and you know they finally understand something and can take it and apply it elsewhere in their careers.

CITATIONS

Do you have any advice for beginners in teaching?
Check your ego at the door, you want to walk into the classroom humble.

My forte has always been taking my hardworking C-average students and turning them into A-students.

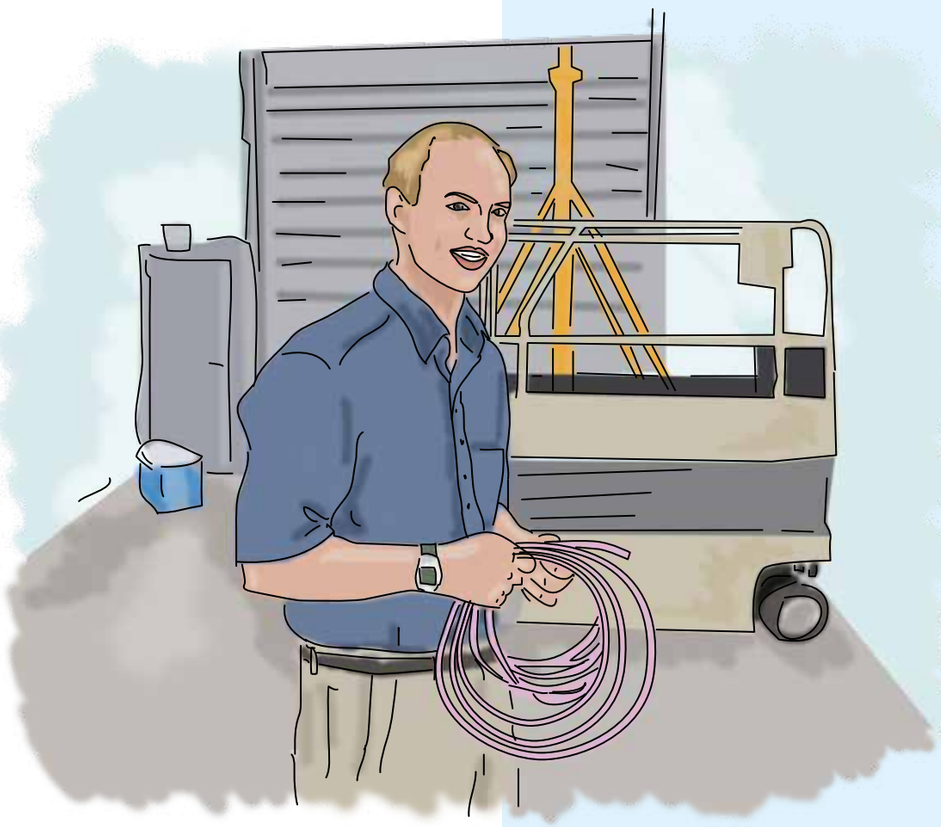
Interviewer: But is it still fun? I mean, does teaching increase your happiness?

Anderson: I've discovered that I'm not a lecturer. Standing in front of a classroom, firing up the Powerpoint, and delivering a lecture is just not something I enjoy doing on a daily basis. I do, however, really enjoy interacting with the students in small groups like in a lab, in projects, mentoring one-on-one, small classes, discussion groups. For me, that's the most rewarding part of teaching and the part of my day that I look forward to the most.

Interviewer: Chris, in one sentence, why do you teach?

Anderson: I really love working with . . . I guess my forte has always been taking all my hardworking C-average students and turning them into A-students. In my class, you don't need to be an academic superstar. If you've got a positive attitude, a good work ethic, and a willingness to learn, I can help you become an A student. I've done that a few times in my career, and it's just an amazing experience every time.

Interviewer: So is there any type of teaching technique that you think is most effective? Or is there a special type of technique that you use the most?



Anderson: I really think that when you can reduce topics down to a 10-minute block. To be able to start, finish, and cover what you need to cover in that block, then you're on today's students' attention-span level. Particularly if you can intersperse those blocks with some sort of hands on . . . get moving, do something . . .

Interviewer: How would you describe the role or influence of the internet in your teaching?

Anderson What's really nice about the internet is that you can find gazillions of YouTube videos on all kinds of topics. But let's say you find 100 YouTube videos on some introductory topic, 90 of which are probably terrible, which is a problem. On the other hand, if you can identify the 10 good ones and point the students at them, it's a great way of providing supplemental information in a media format they're used to consuming.

Interviewer: So where do you see teaching at the university level in 20-30 years?

Anderson: By and large, the U.S. is using the Bachelor's degree as a credentialing service. So what I mean by that is that 20 years ago a degree in something like outdoor recreation was unheard of. You'd think 'why do you need a bachelor's degree in outdoor recreation, it makes no sense?!' But there's multiple programmes across the U.S. now that offer Bachelor's degrees in outdoor recreation. (And I'm not trying to pick on outdoor rec. I've met some really quality people that have graduated from those programs. I'm just using it as an example of something that essentially didn't exist 20 years ago.) And this is like how to be a river guide or how to be a backpacking instructor. Twenty years ago those would have been, perhaps, certifications that you'd have picked up from various agencies, and in today's world you go off to college to get a degree in that. That's the one that I can think of off the top of my head – we've had a general trend of moving away from a general purpose to a more specific degree, and I think it's because employers just want to see that.

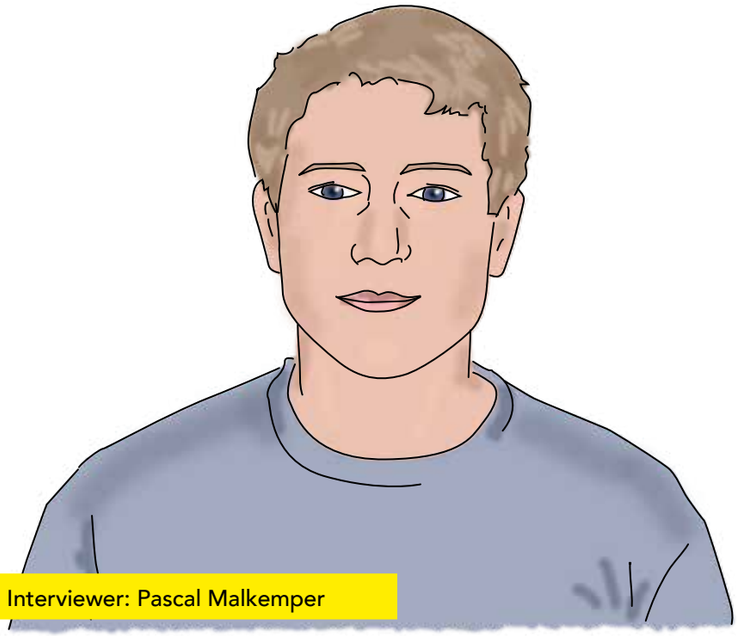
Interviewer: So you think in 20 years you will have a Bachelor's degree for everything?

Anderson: Probably so. Hundreds or thousands of tiny little sub-topical areas which, again, I think is bad, because you're going to have people with specialised knowledge and not general knowledge. I really believe that a Bachelor's degree should provide a broad-based, generalised education with a modest degree of specificity. Specific knowledge, or job-specific skills, are better handled through advanced degrees or specific training programs.

Interviewer: Do you have any advice for beginners in teaching? What would be your best advice?

Anderson: The advice . . . I'm trying to think back to exactly how the advice given to me . . . I can't remember exactly how he phrased it, but he said "check your ego at the door" – so you want to walk into the classroom humble. The other piece of advice is that he said, "it's got to matter." Whatever you do in the classroom has to matter somehow. Students today are challenging us – in a good way – to put their education into context. They want to know why what they're learning matters and how it impacts them or the world.

MICHAEL PAINTER



Interviewer: Pascal Malkemper

Position: PhD Student / Graduate Teaching Assistant

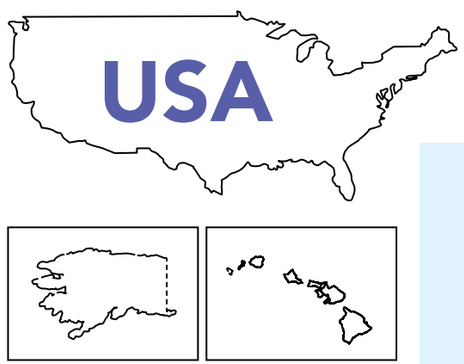
Institution / Country: Virginia Tech (Virginia Polytechnic Institute and State University), USA

Subject: Biology

Teaching: Since 2009

Teaching load: 3 courses/semester, 2hrs lab each, 1hr office time

Teaching Bachelor / Master / Graduates: Bachelor



Interviewer: Which type of courses do you offer, or did you offer?

Painter: Mainly introductory biology courses. So that's been about 80% of what I've taught throughout my tenure here, but I've also co-taught an evolutionary biology course and an honours biology course, which was also an introductory course, but it was at a different level, and a mammology course.

Interviewer: Would you say that you are happy with the status and prestige of teaching in your country?

Painter: From my personal experience, yes, but what I've discovered as a graduate student working more closely with faculty is that their motivations and inspirations are very different from what I thought they were as a student. As a student, I just assumed that these faculty members were there to teach, not understanding that, for many of them, that was [laughs] not only not their primary goal, but also what seemed to be a burden for them sometimes.

Interviewer: So would you say you've felt supported in your role as a young teacher?

Painter: Yes, very much so. The biology labs are set up in a way such that there is a full-time designated lab coordinator. They offer a lot of support for any teaching instructions and advice, or any problems the teacher may have. I've actually been pretty impressed with how the biology department, at least, has set up the infrastructure for support for new teachers.

Interviewer: In one sentence, why do you teach? Or, maybe, why do you want to teach?

Painter: What I enjoy about the teaching is the interaction with students. And for me it's a learning experience as well, so I really like going in, learning material and then explaining it to others.

Interviewer: So there's an egoistic part? That you keep on learning.

Painter: That's really what I enjoy – I learn the material much better when I know I have to teach it somebody, obviously. Teaching broadens my focus, and it makes me think about things, and re-learn things that I wouldn't otherwise focus on. I feel much more well-rounded as a scientist, because sometimes I focus so much on one thing that everything else gets lost.

Interviewer: But isn't it boring? I mean ten years from now, wouldn't it be boring to teach the same things over and over again. How would you keep your enthusiasm?

Painter: Science is an evolving field. It's my philosophy that if you're teaching the same thing today that you taught ten years ago, then you're not doing a good job. I mean, there's obviously some basics that aren't going to change, but if you can't integrate new material into even something that's classical, then I don't think you're doing the job. So one of the very important things as a teacher, regardless of what you're teaching, is obviously staying up-to-date.

CITATIONS

Bad teaching is lecturing the students!

Teaching broadens my focus, and it makes me think about things and re-learn things that I wouldn't otherwise focus on.

I feel much more well-rounded as a scientist, because sometimes I focus so much on one thing that everything else gets lost.

Science is an evolving field. It's my philosophy that if you're teaching the same thing today that you taught ten years ago, then you're not doing a good job.

Interviewer: What kind of methods do you use in teaching?

Painter: One thing that I've done, that's been mildly successful, is that with the students at the beginning of the semester, either we'll lay out some topics that we'll read through, and I have them ask any question they want about any of these topics. Sometimes I don't even do the topics thing – it's just any question in science that's interesting to you that you don't know the answer to, write it on a piece of paper. And then, depending on the class size, I'll try to answer one or two of those questions at the beginning of each lecture. If questions are in line with the material that day then perfect; if not, then we'll just spend two minutes talking about this. "Why is the sky blue?", for example.

Interviewer: You're really brave to . . .

Painter: Well, you'd be surprised how much time I spend looking up these "simple" questions that have really complex answers.

Interviewer: So in your opinion, could you just finish the following sentence: "Good teaching is . . ."?

Painter: Good teaching is piquing the students' interested in the subject matter.

Interviewer: "Bad teaching is . . ."?

Painter: Bad teaching is lecturing the students! [Both laugh]

Interviewer: Where do you see teaching at the university level in 20-30 years? What are the biggest changes that you see coming?

Painter: I think technology in the classroom is the biggest. I see that now students have these, they're called "i-clickers". With those you can basically take quizzes in the class; each vote or each clicker is registered to a student. The professor can stand up there and ask any question, A/B/C/D or 1/2/3/4, and the student selects an option, which is registered to their own little account, and it automatically grades and so on and so forth.

Interviewer: So technology, as it is, is what's changing in general.

Painter: Yeah. And I think it sounds like students are getting more of their education from online resources than they are from anything else. So, textbooks are now converting to online material. Even for the labs that we teach, the students are now supposed to watch a 30 or 45 minute video prior to showing up to class that covers the material that we're going to be talking about in class.

Interviewer: Are the videos produced by Virginia Tech?

Painter: They're produced by the department. So these TA (teaching assistant) coordinators that I was talking about that offer a lot of support, they're responsible for the production of these videos each semester. That's something that these students do, and then they take an online quiz before they even walk into the classroom.

Interviewer: And if they don't pass, then they are not allowed to participate?

Painter: No, it's just factored into their overall grade.

Interviewer: Do you have any advice for beginners in teaching?

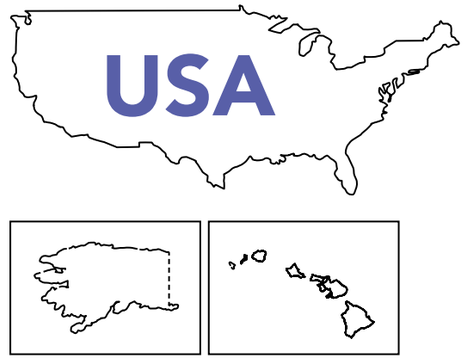
Painter: I think one of the most important things for a first-time teacher is really just getting confidence in the classroom. So, I think it's

very easy for students to pick up on anxious teachers and people who aren't that confident in their teaching style, or just teaching in general, or speaking publicly. The one thing I've seen happen is that the whole lecture or the whole semester can be compromised when the teacher is not very confident.

Interviewer: What are lectures for you – fun or work?

Painter: Hmm. Both. It's a lot of work, so for some of these lecture courses that I've either taught or that I've guest-taught, I spend literally 12-15 hours preparing for an hour lecture, or an hour-and-a-half lecture. So it's an unbelievable amount of work, but, like I said, one of the things that I really enjoy about teaching is the process. I know that that's how long it takes me; I'm prepared for it and it no longer stresses me out, because I just know what I'm getting involved with. I enjoy it, and I learn probably twice as much as the students when I prepare for these lectures.

JOHN B. PHILLIPS



Position: Full Professor

Institution / Country: Virginia Polytechnic Institute and State University (Virginia Tech), United States

Subject: Biology

Teaching time: 30 years

Teaching load: 3 contact hours per week

Teaching: Bachelor / Master / Graduates: Bachelor, Master, graduate courses

Teaching methods: Seminars, lectures, 'think pieces', literature search

Interviewer: Pascal Malkemper

Interviewer: Would you say you're happy with the status and prestige of teaching in your country?

Phillips: Both departments in which I have been a faculty member, at large state universities (in Indiana and Virginia), value teaching very highly. Good teaching is considered very important, even for the most active researchers. As a result, there are many good teachers, many of whom develop innovative teaching methods.

CITATIONS

The most enjoyment I get is not out of making sure they understand what's in the book, but teaching what science is all about, and also how science can be wrong in interesting ways.

We have an open-door policy, so that our students feel very comfortable between labs.

Interviewer: Do you think that being a professor is a reputable profession in the U.S.?

Phillips: Yes, certainly.

Interviewer: Would you say teaching was important for the development of your professional career?

Phillips: The methodology of teaching is one issue, but I think for me as a research scientist, the most important benefit is broadening my information base and gaining new perspectives, because all of our research areas have become very narrow.

Interviewer: Why does teaching increase happiness (if it does)?

Phillips: The reward I get out of both graduate and undergraduate teaching is that the material I teach – neuroethology and animal behaviour – is a lot of fun. But, given a choice, I'd prefer to talk to a small group of students, rather than lecturing in front of a classroom full of students. What I enjoy most is not making sure students understand what's in a textbook, but teaching, showing them what science is all about, and how science can be wrong in interesting ways.

Interviewer: Is there any change in teaching that you brought to Virginia Tech?

Phillips: I was at Indiana University, and, along with two other colleagues, I helped to get a graduate training grant from the National Science Foundation. The goal was to bridge the gap between psychology and biology. Many training grants in the U.S. have graduate students do rotations, where individual students spend short periods of time working in several different labs on their study systems as a way of deciding which lab to join. This type of training grant typically funds students for their first or second year.

In the training grant at Indiana University, we decided to fund students in their second, third, or fourth year, once they had already settled on a project. The funding was designed to enable students to learn a new technique, work in a new lab, or learn about a new study system, i.e., to add a new component to their doctoral work that they would not have been able to do otherwise. The funding also provided students with support that allowed them to travel or to work in another lab at the same university or a different university. This training program developed into the Center for the Integrative Study of Animal Behaviour, which is now quite well known in the U.S.

I helped to implement this type of approach into our graduate teaching at Virginia Tech, and the end result has been more just a change of style. We have an open-door policy, so that our students feel very comfortable moving between labs. They don't have to just work in their own advisor's lab/research. We often have co-advisors, and a number of our graduate students have developed projects that incorporate components from different laboratories.

Interviewer: What would you say is the main task of university education? Is it to produce specific or general knowledge, or both?

Phillips: One of the most important things that university education should do is to help students learn how to think in new ways and to be flexible in their thinking and ability to evaluate evidence. To be able to draw conclusions, but at the same time being able to deal with ambiguity and to consider alternative explanations for the same phenomenon.

At the same time, there is an important element that is driven by the high cost of education in the U.S., which is that a student's education must open up career opportunities that make it possible to pay off educational loans, start a family, etc. So, development of intellectual skills – and learning for the sake of learning – has to be accompanied by career counselling and internships that show students how alumni have made use of the type of training the students are receiving, i.e., how they ended up following a particular career path.

GLOSSARY ENTRIES

ISCED = INTERNATIONAL STANDARD CLASSIFICATION OF EDUCATION

- "Classification system that provides a framework for the comprehensive statistical description of national educational systems and a methodology that translates national educational programmes into internationally comparable levels of education. The basic unit of classification in ISCED is the educational programme. ISCED also classifies programmes by field of study, programme orientation and destination." (UNESCO Institute for Statistics 2017)
- Level 0 = less than primary education
- Level 1 = primary education
- Level 2 = lower secondary education
- Level 3 = upper secondary education
- Level 4 = post-secondary non-tertiary education
- Level 5 = short-cycle tertiary education
- Level 6 = Bachelor's or equivalent level
- Level 7 = Master's or equivalent level
- Level 8 = doctoral or equivalent level

GDP = GROSS DOMESTIC PRODUCT

- "Sum of gross value added by all resident producers in the economy, including distributive trades and transport, plus any product taxes and minus any subsidies not included in the value of the products." (UNESCO Institute for Statistics 2017)

PPP = PURCHASING POWER PARITY

- "Currency exchange rate that equalise the purchasing power of different currencies. This means that a given sum of money, when converted into U.S. dollars at the PPP exchange rate (PPP dollars), will buy the same basket of goods and services in all countries. In other words, PPP is the rate of currency conversion which eliminate the differences in price levels among countries. Thus, comparisons between countries reflect only differences in the volume of goods and services purchased." (UNESCO Institute for Statistics 2017)

GROSS ENROLMENT RATIO

- "Number of students enrolled in a given level of education, regardless of age, expressed as a percentage of the official school-age population corresponding to the same level of education. For the tertiary level, the population used is the 5-year age group starting from the official secondary school graduation age." (UNESCO Institute for Statistics 2017)

GROSS GRADUATION RATIO

- "Number of graduates regardless of age in a given level or programme, expressed as a percentage of the population at the theoretical graduation age for that level or programme." (UNESCO Institute for Statistics 2017)

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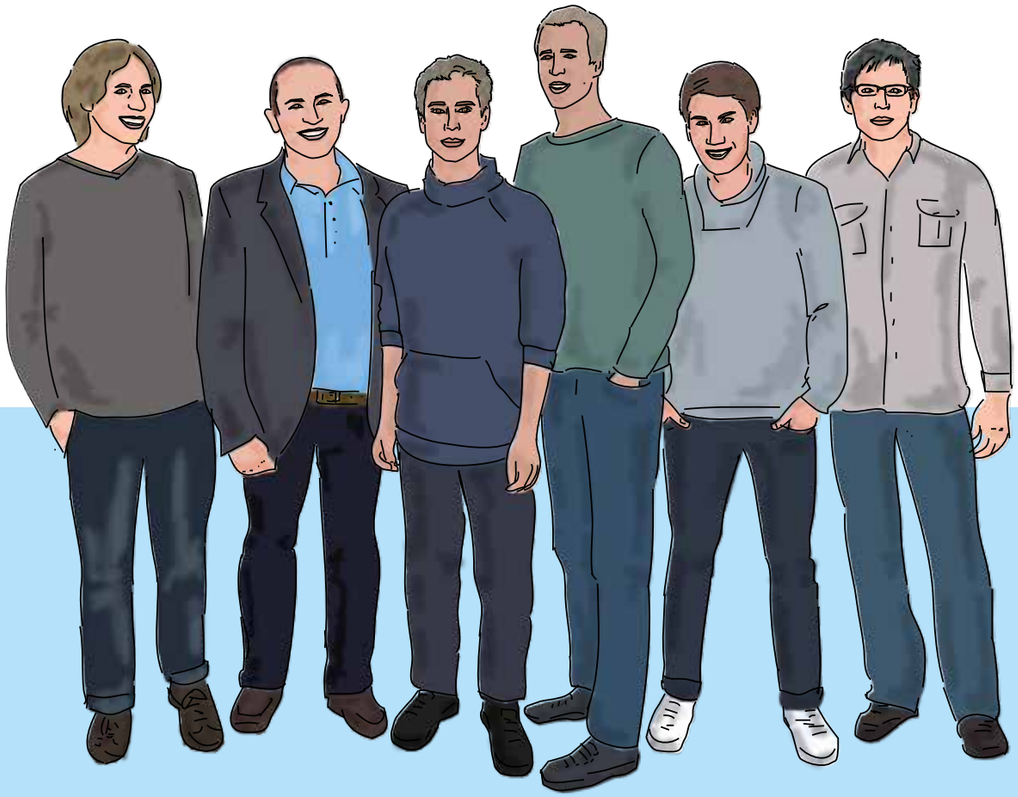

ACKNOWLEDGEMENTS

This book would not have been possible without the help of many people. We are indebted to all of them for their input and dedication towards this project. The following people deserve special mentioning:

FOR TAKING PART IN THE INTERVIEWS:

All our interview partners who shared their views on academic teaching.

FOR THE DRAWINGS OF THE INTERVIEWEES:

Sasha Ediger // designmodus.com

FOR GATHERING INFORMATION ON EDUCATIONAL SYSTEMS IN DIFFERENT COUNTRIES:

Isa Steinmann, research fellow at the Center for Research on Education and School Development at TU Dortmund University

Rolf Strietholt, senior researcher at TU Dortmund University and University of Gothenburg

FOR CARRYING OUT ADDITIONAL INTERVIEWS:

Julia Nase, Department of Physics, Chair Experimental Physics I, TU Dortmund University

Marcella Woud, Department of Clinical Psychology & Psychotherapy, University of Bochum.

FOR TRANSCRIBING THE INTERVIEWS:

Calum Tollick

FOR PROOFREADING ALL TEXTS:

Heidi Samuelson

FOR ALL THEIR HELP WITH ORGANIZATIONAL ISSUES AND THEIR ADVICE:

Ann-Christin Bauke & Monika Zwerger, Project Managers Global Young Faculty

Isabell Hilpert, Communication Manager Mercator Research Center Ruhr

FOR MAKING ALL THIS POSSIBLE IN THE FIRST PLACE:

The Global Young Faculty IV, the Mercator Research Center Ruhr and the Mercator Foundation.

NOTICES

PUBLISHER: University of Duisburg-Essen, University Library, Universitätsstraße 9-11, 45141 Essen

EDITING: Heidi Samuelson

DESIGN: Sasha Ediger

TYPESETTING: Sasha Ediger and Ayna Bogdanova

WORLD MAP GRAPHIC: Nazarkru/Shutterstock.com