Teaching Portfolio

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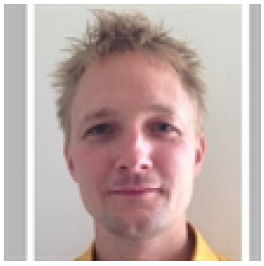

Formal educational training

Lecturer training program, University of Southern Denmark, 2016-2017.

Pedagogical courses: 1) Use Student Response Systems in your teaching, 2016.
2) Supervision -Roles and relations, Pedagogical course, 2016.
3) Body Language -A grammar to non-verbal communication, 2016.

Administrative tasks related to education

1) *Restructure of Master degree* in Mathematics, 2019
2) *Quota 2 applications* for Mathematics, 2018--
3) *Semester responsible* for Mathematics, 2018--
4) *Teaching plan* for Mathematics, 2019--

Experience with teaching, supervision and examination

Teaching and examination: 1) *Matematik*, 10 ECTS first year course, Written exam, Lecturer, University of Southern Denmark, Fall 2016, Fall 2017, Fall 2018, Fall 2019, Fall 2020.
2) *Kandidatseminar*, 5 ECTS graduate course, Oral exam, University of Southern Denmark, Fall 2020.3) *Topologi og kompleks analyse*, 10 ECTS bachelor course, Written exam, Lecturer, University of Southern Denmark, Spring 2019.4) *Matematiske metoder*, 10 ECTS first year course, Take home assignment, Lecturer, University of Southern Denmark, Spring 2017, Spring 2018, Fall 2018.
5) Udvalgte emner i moderne analyse, 10 ECTS graduate course, Lecturer, Seminar, University of Southern Denmark, Spring 2020.
6) *Introduktion til ikke-kommutativ geometri*, 10 ECTS graduate course, Take home assignment and seminar, Lecturer, University of Southern Denmark, Spring 2018.
7) *Noncommutative geometry*, 10 ECTS graduate course, Take home assignment, Lecturer, Radboud University Nijmegen, Spring 2015.
8) *Basics of noncommutative geometry*, PhD course, Oral exam and seminar, Lecturer, International School of Advanced Studies (SISSA), Fall 2013.

Supervision: 4 *Bachelor theses* 2017-2020, 5 *Master theses* 2016-2020 (3 at SDU and 2 at Radboud University Nijmegen).

Methods, materials and tools

Student Response System, Electronic in lecture tests for the first year courses "Matematik" and "Matematiske Metoder", 2016-2018, University of Southern Denmark.

Lecture notes on Linear algebra ,for the first year course "Matematik", 2017-2018, University of Southern Denmark.

Lecture notes and exercises on Noncommutative geometry, for the graduate course "Noncommutative geometry", 2015, Radboud University.

Educational development and educational research as well as educational awards

Lecturer training program development project “Electronic in lecture tests for mathematics", 2016-2017.

Teaching award for Mathematics, Radboud University Nijmegen, 2015.

Activities as external examiner

University of Copenhagen, Homological algebra, Graduate course, Written exam, Simon Philipp Gritschacher, 2020.
University of Copenhagen, Geometri 2, Graduate course, Oral exam, Henrik Schlichtkrull, 2020.
University of Copenhagen, Advanced vector spaces, Graduate course, Oral exam, Henrik Schlichtkrull, 2018, 2019.

Reflections on teaching practice and future development including student evaluations

In a teaching situation, I am very aware of how the students are responding to what I am saying, and I try to adjust according to the feedback, which I am constantly receiving from them. If the students are too silent or look too confused I will make sure to ask further questions on the topic that I am trying to explain. According to their response I will either continue with my lesson or go deeper into an explanation of the material. In this way I am staying in a continuous dialogue with the students and this makes them feel safe and increases their willingness to ask further questions.

After the lecture, I reflect on the responses I got from the students and this review then has an impact on the level and intensity of the following lectures. I am thereby constantly staying in tune with the needs of the students.

The written student evaluation of the teaching is also an important source of information, which can be used for improving the teaching. Based on this material my teaching has developed considerably especially with regards to the speed of my lecturing. Surprisingly enough, slowing down the pace of a lecture does not necessarily mean that less material is being covered. It gives me more time to think about what I am actually saying and for sure it helps the students absorb the content of the lecture. In this way a lot of repetition is avoided.

I find it very helpful to remain in interaction with my colleagues even from different faculties. In this way, I can help improving the alignment across the courses offered to the students. This avoids that students are overburdened with too many assignments at the same time, and it helps ensuring that the students have the necessary prerequisites for understanding a new topic. Discussions with colleagues are also a source of inspiration for developing my own teaching practice, for example with regards to motivating mathematical material with examples coming from more applied areas like physics or economics.

Teaching principles

The main activities of a mathematician are to investigate new mathematical ideas and to explain these ideas to other people. The achieved knowledge will otherwise remain isolated and will not contribute to the development of our society. Teaching is therefore a very important task for a mathematician. We are here to develop our own research, but also to share our findings with others.

In a teaching situation, it is fruitful to constantly encourage the students to think independently and to stimulate them in finding answers on their own. Even though the teacher usually has deeper knowledge on the subject than the students, it is often better to avoid providing all answers straight away. I believe that this method helps the students to develop a critical and analytical approach to science and even to life in general.

In a more concrete way, it is important to invite the students to participate actively in the lessons. This can of course be done by asking questions during the lectures, but also by letting students vote electronically, using a well-functioning student-response-system such as "Poll Everywhere". This has the further advantage of permitting the teacher to find out how many students grasp the content of the lecture. Most students also respond positively to a learning situation where they have the possibility of testing their own understanding.

As far as exercises are concerned, I believe that the formulation can sometimes be open-ended. Instead of letting the students prove that a given statement is correct, they also have the opportunity to consider actively whether a statement is correct or not. This is much closer to what happens in actual research, where the scientist constantly has to adjust the goals according to the evidence that he or she finds. Science is full of open questions and this can be reflected in the teaching.

Another key ingredient, is to diminish the distance between teacher and student. As an example, I believe that the students are intellectually stimulated, when they see that the teacher can make (small) mistakes, which they can then help correcting. An obstacle for learning mathematics is the very rigid idea of a ``correct'' answer. This idea of ``truth'' in mathematics often discourage students from sharing what they know, because they are too afraid of being ``wrong''. But making mistakes is a huge part of the learning process and is certainly very human. A more flexible attitude from the teacher also allows for a more dynamic dialogue between teacher and student, and it encourages students to never just rely on what they are being told.