Teaching statement, Urban Larsson, March 2018,

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For those of us who aspire brilliant teaching, we do need to look a bit at the learning problems the students may run into. Let me list a couple of potential obstacles, and then I would like to point to a way forward.

Unfortunately, the noble goal of 'education for the masses' might not always promote a good teaching/learning environment for all individual students. Still, we continue supporting 'mass education', mainly for the practical reason of the many students that need to be graded. It is a crude reality that many approved students do not learn the subjects for hand; one reason for this is arguably various copycat proceedures among students, which do not invoke the necessary thinking on the subject.

I taught several university courses in mathematics, at Chalmers & University of Goteborg, Goteborg, Sweden, and Dalhousie University, Halifax, Canada, and I was responsible lecturer for three. For one of these courses I developed a new course plan and later lectured about it in a seminar series (initiated together with Dr. S. Bengmark, Chalmers, Sweden). The course plan involved student creativity, by learning to ask fellow students questions about the subject, and also evaluating the answers. They worked in groups, and everyone did all three parts of the plan, composing problems, solving problems, and evaluating the solutions to the problems. In fact, I reused those student-created problems (with small changes) for their final exam. In this course we activated new areas of the students thinking; parts were used in this course that had hardly ever been used before (in their own opinions).

Before this I taught many highschool courses in computing and mathematics. It occured to me several times that the best students do not really need the lectures, but they probably have good use for them. The levels below the best students find it hard to cope the speed of lecturing, so they often resort to copycat proceedures in the hope of getting to learn later. However, within the curriculum there is rarely room for 'a later', so most subjects get only a very superficial overview, so learning might not be efficient, at least not in the cases where it stops with the examination.

One aspect of teaching is that I learn a lot while teaching; my understanding of the subject evolves, in particular in relation with students' learning. Unfortunately, I have seen several students below the top level leave the course due to a `too high abstraction level' (this was a course in Vector Spaces for second year students where I adapted a more standard course plan) and there was not enough room in

the course plan to help those students understand new ways of thinking, before they already left the course (money back if they leave before mid-term). The crude reality seemed to be: 'either you get it, or you do not get it'. Is there a way to guide the students in more abstract thinking?

Can my new course plan help remedy such situations?
Some students may be more inclined towards problem solving, or even in making up new interesting problems. How can those students be targeted to a larger extent? Mathematics is larger than just learning a variety of math subjects, and we may loose students who have more inclination towards designing and solving problems rather than assimilating prearranged courses. I would like to be part of a different math education, with a curriculum, which allows for more individual creatvity at all levels of university mathematics.