# Teacher students’ identity as mathematics practitioners

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This presentation investigates how graduating secondary school mathematics teacher students describe the evolution of their relation to mathematics during a 5-year teacher education program. It builds upon in-depth interviews with students. We examine identity in the sense of Sfard and Pruzak, i.e. narratives about individuals that are reifying, endorsable, and significant. These narratives about the students’ development express a deepened interest for the subject, a view of the field as a connected whole, an appreciation for a variety of representations, ease with mathematical language and notations, and self-confidence in problem solving. Narratives also show that the process of development builds upon many small steps.

## Introduction

When a student asked me “Is it true, what they say about the teacher program, that the reason why we have to study so many hard math courses is that you want to select only student who are really interested in mathematics?”, I realized that I knew little about how the students see themselves in relation to their studies. I had expected to field questions about how “smart” students needed to be, or how well-prepared, but had assumed that the choice of becoming a math teacher built upon an interest for the subject. This study investigates student identity in the sense of exploring how students talk about their development as mathematics practitioners during a 5-years university program for upper secondary school teaching.

## Research on mathematics student identity

Pre-service teachers’ learning of mathematics has been studied extensively, primarily regarding cognitive aspects but also from the point of view of attitudes, beliefs and identity (Hannula et al., 2016). The affect-related dimensions are notoriously vague and difficult to define. This study builds on Sfard and Pruzak’s notion of identity as ‘those narratives about individuals that are reifying, endorsable, and significant’ (Sfard & Prusak, 2005), where *reifying* refers to statements about how the person is, rather than about what they do or think, *endorsable* means that the person in question would agree that it describes them, and *significant* that the statement brings up an important characteristic. Note that in this framework, identity consists of the narratives themselves, not of mental properties that the narratives would be an expression for.

## Methodology

This study builds upon in-depth interviews with four student teachers graduating from a 5-year integrated university program leading to teaching credentials for upper secondary school in mathematics and one other subject. The interview with each subject started with a mathematical problem and continued with open-ended questions on how they approached the problem, how they thought they could use it in teaching, and how their current view of working with mathematics had developed since the beginning of their studies. Narratives pertaining to identity in relation to mathematics were analysed thematically, looking for central themes common to most or all interview subjects.

## Results

Six themes emerged in the analysis that show how the graduating students identify their own progression as a practitioner of mathematics.

All interviewees described *a shift in their interest for mathematics*, from a focus on computing answers for exercises, to an engagement in understanding mathematical relationships and curiosity for mathematics per se. They express *a view of the field as a connected whole*, contrasting with a memory of viewing it as a collection of separate, context-bound methods. They showed *appreciation for using a variety of different representations*, e.g. graphical and analytical, with translating from one to another as a way to process a problem and understand it. Students pointed out a new *ease in using mathematical language and notations*. In the problem that the interview started with, the notation $f^{-1}$ was used for an inverse function. This prompted reflections about differences in attitude while dealing with unfamiliar notation, from giving up to embracing new expressions. Students also claimed a heightened *self-confidence as problem solvers*, both accepting that one can temporarily stand still and knowing that they will eventually find a way to handle the problem. Describing the dynamics of their maturing process, the students mentioned not only a modelling course meant to foster problem-solving skills and connections, but also almost all mathematics courses in the program, as well as school practice, emphasizing *the complex and long-term nature of their development as mathematical thinkers*.

Discussion and conclusions for this work in progress will be elaborated on at MADIF.

## References

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Sfard, A., & Prusak, A. (2005). Telling Identities: In Search of an Analytic Tool for Investigating Learning as a Culturally Shaped Activity. *Educational Researcher*, *34*(4), 14-22. <https://doi.org/10.3102/0013189x034004014>