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From university mathematics students to postsecondary teachers

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Introduction

Little is known about the transition from being a university mathematics student to being a postsecondary teacher (e.g. Speer & Hald, 2008), particularly in cegep institutions (general and vocational colleges), the first step in postsecondary education in the province of Quebec, Canada. The program in those institutions covers, notably, calculus and linear algebra. Our goal is to explore that transition into being a teacher, while focusing on the (past and present) experiences of new teachers in relation to mathematics, and its teaching and learning. We do so by conducting a narrative inquiry with 5 new teachers with less than 5 years of experience, with whom we have met individually seven times over a semester. We *lived* alongside them and heard about their stories, their lives and their experiences.

In our work, we speak of “being a teacher” in the sense of *acting and thinking as a teacher*, rather than holding a teaching job. We see it as a “process of becoming” (Beisiegel, 2007, p. 23) that starts before the first teaching job and that will continue long after. It is supported by the idea that mathematics students receive implicit teacher training during their time as students, where their life experiences in a mathematics department shape their “views of the discipline and its teaching” (Beisiegel, 2009, p. 42). We see “being a mathematics teacher” as involving, among other things, thinking about mathematical concepts, with teaching and learning in mind, in a way that reminds us of Shulman’s (1986) pedagogical content knowledge. It also involves thinking, to various degrees, about the role of a teacher, presentation, assessment and the creation of material.

As we analyzed all the stories these 5 new teachers shared with us, we came to the realization that 4 out of the 5 participants were not “being teachers” during their studies in mathematics; for them, this “being a teacher” only happened when they actually held a teaching position, even if some of them were aiming for a teaching career. This triggered two reflections for us.

Firstly, we identified essential differences between what they need to emphasize to be successful students versus what they need to emphasize to be successful teachers. On a daily basis, to succeed as a mathematics student, they needed to create and validate proofs a professor deemed important, figure out what is expected from them to succeed in assessments and researching for proofs that may not even exist. To be teachers, instead, they would need to think about what is important for their students to learn while keeping it at a level that is adequate, what work would represent a passing grade in a particular course and choosing problems that would be interesting to solve, not for them, but for their students. The gap between these two needs suggests that there was no time or space during their studies in mathematics to “be a teacher.” This reflection shows us one way in

which the transition to post-secondary teaching could be different than the transition to school teaching since such time and space is probably not lacking in university teacher training.

Secondly, too often, mathematics faculty who focus on teaching are perceived by their colleagues as weak mathematicians who could not succeed as researchers; these “second-class” mathematicians are not good enough to participate in the very competitive mathematical community (Kline, 1977, cited in Beisiegel, 2009). Beisiegel (2009) showed the influence of this culture for graduate students, saying that “as [they] attended to the existing practices of the department, there were suggestions and rites of passage which revealed that only [...] becoming a mathematician, really counts” (p. 287). Also, Beiseigle (2007) states that “many dichotomies exist in mathematics and, in [the mathematics] community, you either are or you are not a mathematician” (p. 23); if you are a mathematics teacher, you are not a mathematician. Again, we can briefly underline how different this situation is from university teacher training, where students are not, most likely, torn between two different identities, as becoming a teacher is the goal of their education.

One of the participants in our study, however, seemed to have been successfully a mathematician and a mathematics teacher during her degree in mathematics. Indeed, as a student, while keeping up with the highest standard of performance in her classes, she would constantly look at how the class was presented, thinking how she would do it when she would get to stand in front of a classroom, collecting great explanations of things as models and always asked herself, “why?” and “what if?” specifically so that she would be more prepared to teach certain pieces of mathematics. We believe that those two differences put her in a similar position than a student in a teacher training program (Lee & Shallert, 2016). Our research explores why it is that she was “being a teacher,” according to our definition above, in the midst of a mathematician’s training, while the others did not.

This research goes into detail of some stories shared by the participants about their transition from mathematics student to teacher. Because we found that it is possible to do both, “be a mathematician” and “be a teacher,” during a mathematicians’ training, we ask how we can help mathematics students to “be teachers” while in their mathematics training and to help them use this time to their advantage.

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