

## **Close encounters of the third kind: What we learned from collaborations between mathematicians and education researchers**

Research on university-level mathematics teaching and learning is on the rise; over the last decade it has grown from a cottage industry into a robust enterprise. However, the insights gained through this research does not seem to reach those who practice university mathematics teaching. This is partly due to lack of communication between mathematicians and mathematics-education researchers, and partly due to barriers in communication, caused by the profound differences in research paradigms.

Five years ago, I completed a PhD in mathematics and ‘crossed the lines’ to research on mathematics education. However, my first interactions with mathematics education research were very frustrating. I just couldn’t make sense of this “soft” research that seemed to be grounded in sloppy definitions, fuzzy arguments and feeble reasoning. It took time and patience before I was able to recognize and appreciate what the research in this field has to offer.

In my talk, I will reflect about my transition to mathematics education, and the barriers in communication that I had to overcome. I will then present several examples that illustrate how collaborations between mathematicians and mathematics education researchers can provide new insights into some of the big questions about university mathematics teaching. Among other questions, I intend to discuss what students learn about mathematics at university; what part of what students learn constitutes as legitimate content for university mathematics courses; why do we teach proofs; what sort of understanding do we expect students to leave class with; to what extent are the students aware of our expectations and agree with them. While discussing what research about mathematics education can tell us about these broad questions, I will try to highlight key insights that could be useful for instructors right away.