

Jerome Proulx

Looking at students: from a medical/deficit view on mathematical knowledge toward possibilities of mathematical actions

Most work in mathematics education (research and teaching) focuses on students' learning of mathematics. The (tacit) orientation taken is to look at that learning and create a conjecture on what the students know or don't know, and then making an attempt at finding ways of helping students to develop, or better understand, this mathematical knowledge. In this presentation I suggest that there are two major difficulties with this attitude for mathematics education. The first difficulty concerns the fact that mathematical knowledge is seen as a thing, something someone can grab onto, as if it existed by itself, independently. This view on mathematical knowledge leads to a second difficulty, which is that it offers a "deficit" view of learning, influenced by medical orientations (see Bélanger, 1991). Considering mathematical knowledge as an external thing "to know about" unfortunately leads to comparing students' mathematics with an allegedly external mathematics. With that orientation, students are always seen as lacking something, as needing more. They are always seen in deficit. I argue that this view is problematic for conceptualising about mathematical activity, and even ethically, and that a change is needed toward looking at what is made possible by students' actions and where it can lead to, rather than focusing on something that is supposedly missing. This advocacy requires transformations in our current paradigms, and I present the theoretical groundings from ethics, cognitive science, biology, mathematics and didactics to support this view, as well as discussing the methodological shifts that this imposes for analysing students' mathematics.

Keywords: Mathematical learning, knowledge and actions, Deficit view, Mathematical possibilities