CHARACTERIZING TEACHERS' INFORMAL CONCEPTIONS OF LEARNING TRAJECTORIES IN MATHEMATICS

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While there has been a considerable increase in research related to learning trajectories (LT) in mathematics (e.g., Clements, Wilson & Sarama, 2004), more recently, researchers have begun to explore LT-based professional development (PD) programs (Wilson, 2014) and how teachers use LTs in their instruction. Little attention, however, has been paid to teachers' own conceptions of LTs, conceptions that are often (re-)formed from their instructional interactions with students over time. In this poster, we characterize teachers' informal conceptions of LTs in middle school math to better understand ways of supporting teachers to effectively navigate students' LTs during instruction.

Data from this study is taken from the BLINDED Project, a multi-year project focused on developing LT-based instructional resources and PD for middle school teachers. Ten participating teachers were interviewed at least 3 times across the first year of the project about their instructional and assessment practices. Our analysis focuses on how teachers think about LTs in the context of these interviews. We define LTs as an empirically-supported description of ordered experiences students progress through instruction, moving from informal to formal ideas with increasing sophistication over time (Confrey, 2008). We are particularly concerned with the landmarks and obstacles that define such a progression.

Results of our analysis raise several important issues. First, teachers' described *sequences* of student learning and *obstacles* students typically encounter as part of these sequences, which comports with definitions of LTs. However, teachers described these *sequences* and *obstacles* at different *grain sizes* of specificity. For example, three types of grain size emerged from the data: LTs at grade level, LTs at instructional unit level, LTs at math topic level. We found that teachers generally talk about LTs at a large grain size (e.g., students struggle with fractions), but seldom attend to finer grain size levels of LTs, especially levels of sophistication in students' thinking, which echoes those of Wilson (2014). Second, we identified the concept of *gap* in teachers' reflections about LTs, which we define as a lack of prior math knowledge that students should have become proficient in previously. While teachers help students tackle obstacles from newly-learned topics, they have to address the knowledge gaps relevant to the math concept understudy. We argue that it is important for LT research to not only on develop LTs, but also on the development of instructional resources that support teachers in managing obstacles and gaps.

References

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