

## From deficiency to strengths: Prospective teachers' shifting frames in noticing student mathematical thinking

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In recent years, mathematics education scholars have shown an increasing interest in teachers' professional noticing (e.g., Choy & Dindyal, 2020; Kaiser & König, 2019; Philipp et al., 2014; Scheiner, 2016). This presentation explores shifts in prospective mathematics teachers' frames in noticing students' mathematical thinking over time. The focus is on what prospective teachers attend to students' mathematical thinking, how they talk about what they notice, and in what ways both what they notice and how they talk about it changes over time.

In particular, two changes in prospective teachers' noticing are discussed in detail. First, prospective teachers changed what they have paid attention to students' mathematical understandings. Initially, teachers attended to missing aspects of students' mathematical thinking, and later, they attended to productive aspects of students' mathematical thinking that serve as resources for students' further learning. Second, prospective teachers changed with regard to the ways they have interpreted students' mathematical thinking. Initially, teachers interpreted students' mathematical understandings as faulty and deficient compared to the canonical understanding of mathematics. Later, they interpreted the same understandings as productive and valuable in their own right.

Analyses of data of prospective teachers' written responses to students' mathematical work are presented, and two framings of teacher noticing are discussed that resulted from these analyses: a deficit-based framing and a strength-based framing. These two framings are considered fundamental in accounting for the changes in teachers' noticing of students' mathematical thinking.

The presentation concludes with the outline of a model of teacher noticing that suggests that noticing is directed by teachers' framing (see Scheiner, 2021). More important, perhaps, this model suggests that perception and cognition reinforce each other, and that the teacher is an integral part of the world of classroom events. Implications of framing theory for the notion of teacher noticing are discussed, and its consequences for the study and development of teacher noticing are outlined.

### References

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