

## FOCUSING ON STUDENT THINKING

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*We report on our analysis of teachers' investigation of student work on open-ended mathematics tasks and present an emerging framework for explaining the variety of ways teachers engage with and attempt to analyze and organize conversations about student work. This emerging framework will provide potential starting points for professional development focusing on student-centered instruction.*

Despite the importance of student thinking in instruction, mathematical noticing has only become a focus in mathematics education research in the past decade (Sherin, Jacobs, & Philipp, 2011). Recent studies have documented the importance of analyzing teachers' attempts to notice specific aspects of student thinking and classroom events and interactions, little is known about the specifics of supporting teachers' ability to engage in productive mathematical noticing (van Es & Sherin, 2008). Our guiding research question is: *When tasked with engaging with student mathematical thinking, how do teachers interpret and enact that task?*

Data comes from a three-day professional development institute focused on supporting teachers' to collaboratively develop and use formative assessment. We report on 24 teachers who were given open-ended tasks to individually review, analyze and describe student solutions and explanations to open ended problems and then discussing that analysis in small groups. Empirically verified characterizations of the ways teachers' interpret and enact tasks focused on analyzing student thinking were the result of the iterative process of conjecturing, testing, and revising.

We describe three characterizations of the way teachers interpret and co-construct the presented task (focusing on instruction, focusing on a calculations, and focusing on strategy). These characterizations provide potential starting points for professional development focusing on student-centered instruction; without recognizing the various understandings and interpretations that teachers bring to professional development, it is likely that teachers will not interpret instructions in the way they are intended. Further, it is likely that teachers with different interpretations may encounter communication challenges and have difficulty successfully completing the task, engaging in productive argumentation, or coming to consensus.

### References

- Sherin, M. G., Jacobs, V. R., & Philipp, R. A. (2011). *Mathematics teacher noticing : seeing through teachers' eyes*. New York: Routledge.
- van Es, E. A., & Sherin, M. G. (2008). Mathematics teachers' "learning to notice" in the context of a video club. *Teaching and Teacher Education*, 24(2), 244-276. doi: <http://dx.doi.org/10.1016/j.tate.2006.11.005>
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