Paper session 6B | Analyzing quality through observations in mathematics classrooms

Room: Tetra

Chair: Mark White, University of Oslo

The important thing is that you can explain it mathematically - Nordic mathematics lessons high in both cognitive activation and teacher explanations

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To provide accurate and clear explanations of mathematical concepts has traditionally been considered an important part of teaching. At the same time, prompting students to justify their answers and explain their ideas is an indicator of teaching for student understanding. This paper aims to explore the connection between the quality of instructional explanations and cognitive activation. One aspect of cognitive activation is to what extent students are set to explain their thinking. One could hypothesize that classrooms where students are prompted to explain their ideas and understandings are ones where students' own inquiry and discovery learning is preferred over learning through teachers' explicit instruction. The paper explores this hypothesis. The study builds on QUINT's LISA Nordic video database of mathematics classrooms from the Nordic countries. As of this writing, eight lessons from four Nordic countries have been analyzed, where each lesson was identified as high in cognitive activation by indicators of classroom observation scores in two PLATO elements: intellectual challenge and classroom discourse. In ongoing analyses, specific episodes are analyzed where a third element, representation of content, is also at a high-level within the lessons.

Preliminary findings illustrate that the mathematics lessons with the strongest evidence of cognitive activation at a high level also include considerable explicit instruction with teacher explanations at a high level. Examples will further illustrate how teacher explanations were weaved with student explanations in these cognitively activating lessons. This study contributes richer empirical understandings of teacher explanations and cognitive activation which are vital to apply research results to teacher training and development. It also evokes theoretical questions on the two characteristic metaphors for learning, i.e., acquisition and participation, and on potential shortcomings of dichotomies in theorizing teaching and learning.