



## Exploring student-centered approaches to measuring cognitive activation in classroom Tasks: a multi-camera video analysis of a third-grade mathematics lesson

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The implementation of complex tasks in the classroom to foster students' cognitive engagement is crucial for teaching quality. However, measuring cognitive activation presents methodological challenges, as observers and students assess it differently. This study adopts a student-centered approach to explore the various types of utilization concerning the same potentially cognitively activating task that may emerge within a class. Video recordings of instructional lessons were analyzed using the documentary video analysis method. The study employed a multi-camera strategy, and the sequences were derived from a third-grade mathematics lesson. By analyzing various camera perspectives within a teaching lesson, three fundamentally distinct approaches to task completion among students were reconstructed. These approaches differed

in the social relationship between the students, content-related alignment, and the manner in which the students interacted with one another. The significance of this research is to gain first access to more student-centered research of teaching and interaction quality in relation to the processing of (potentially) cognitively activating tasks. Such an observation can help to focus on the heterogeneity of the students in a class and the different ways of using task stimuli by students. Furthermore, the study can shed light on how significant the interactions between individual or multiple students are in the classroom, making teachers aware of the different ways in which students interact with one and the same task that might be cognitively activating.