

An Operational Framework of Active Learning

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Defining active learning for both research and practice is complex and challenging. Definitions emphasize that active learning is *not* direct instruction then reference aspects of student engagement (Freeman et al., 2014; Hayward, Kogan, & Laursen, 2016). John Dewey (1914) argued that “not” definitions limit sustained experiential educational reform and are difficult for teachers to implement. Research with novice teachers illustrates confusion between the facilitator’s goal with active learning and the participant’s goal with active learning (Rogers & Yee, 2018). Specifically, novice teachers struggled to recognize which students should be engaged with which type of active learning.

Overlaying Vygotsky’s sociocultural theory (Steele, 2001) onto the active learning framework provides two dimensions to categorize methods of learning that clarify and distinguish factors of active learning without polarizing it as simply “not” direct instruction. The first dimension looks at who or what the instructor engages with while the second dimension looks at who or what the participants engage with. Table 1 clarifies and distinguishes critical aspects of active learning using a sociocultural lens. From this table of nine categories for learning activities, we see the limitations of direct instruction, while having a larger sense of what is possible with teaching activities. This framework provides the field with an operational frame to generate meaningful discussion around organizing teaching activities for novice teachers as well as code and analyze research data, fundamentally showing how multidimensional teaching can be. This framework can promote theoretical discussion within the Active Learning Mathematics Research Action Cluster of the MTE-Partnership.

Table 1
Sociocultural Dimensions with Examples of Active Learning

	Instructor Engages with Content	Instructor Engages with Group(s) of Students	Instructor Engages with Whole Class
Students Engage with Content	<i>Direct Instruction</i>	Concept Maps Application Card	Wait Time Muddiest Point Self-Assessment Quiz Brainstorming Set It Up
Students Engage with Instructor	<i>Student Questioning</i>	Role-Playing	<i>Teacher Questioning</i> Quick Poll Minute Paper Inquiry-Based Learning
Students Engage with Students	Find the teacher’s mistake Application Card	Inquiry-Based Learning Peer Review Case Studies Jigsaw	Think-Pair-Share Muddiest Point Inquiry-Based Learning

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