

Webinar Handout

Climbing the Engagement Ladder in Math: From Passive Participation to Powerful Collaboration

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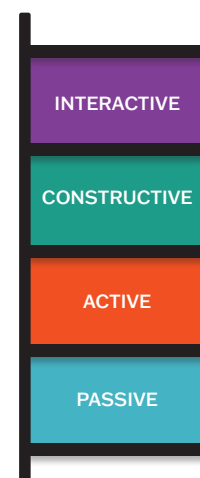
Cognitive engagement measures the extent to which students are engaged—actively invested—in their learning. Experts in cognitive engagement have found that it's not the presence of engagement but the extent of that engagement that makes a big difference for learning outcomes.

ICAP Framework for Engagement:

PASSIVE ▶ ACTIVE ▶ CONSTRUCTIVE ▶ INTERACTIVE

Highly engaged students are those who

- learn deeply by connecting with others on a social, emotional, and cognitive level;
- retain and construct knowledge because the learning experience is meaningful and memorable;
- build confidence in concepts they may have previously found intimidating;
- develop language and math discourse through exploration and collaboration; and
- begin to see themselves as problem solvers and capable mathematicians.



LEVELS OF COGNITIVE ENGAGEMENT

Engagement Type	What It Means	What It Looks Like in the Classroom
Interactive engagement	Collaborating to build knowledge together	• Engaging with other students • Solving problems in a group • Negotiating meaning together
Constructive engagement	Creating new ideas	• Drawing a diagram from memory • Asking questions or elaborating • Comparing solutions
Active engagement	Participating through focused attention	• Copying notes • Underlining key concepts • Reading problems aloud with inflection
Passive engagement	Paying attention	• Listening to a lecture • Watching a video • Minimal interaction

Chi, Michelene T. H., and Ruth Wylie. "The ICAP Framework: Linking Cognitive Engagement to Active Learning Outcomes." *Educational Psychologist* 49, no. 4 (2014): 219–243. <https://doi.org/10.1080/00461520.2014.965823>.



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