Common Misconceptions: Productive Struggle Causes More Robust Understanding and Learning

MISCONCEPTION

Many educators believe that struggling or grappling with challenging math tasks causes students to gain a deeper understanding than would be achieved if they learned the same skill without a struggle.

TRUTH

Productive struggle does not deepen understanding, grit, or creative problem solving. Productive struggle can lead to frustration and cause students to develop misconceptions.[a] In addition, the 'false starts' involved in struggling with challenging tasks without adequate support or guidance lead to lost instructional time and inefficiency.[b]

What is the problem with productive struggle?

- No evidence suggests giving students partial information for making connections leads to learning.[c]
- The idea comes from constructivism, which runs counter to what we understand about math learning.[d]
- Students learning new skills require clear demonstrations and guided practice with immediate feedback.
- New concepts are not learned by struggling. Making connections relies on a foundation of learned knowledge.

REFRAMING PRODUCTIVE STRUGGLE

Using productive struggle for generalization involves providing effective explicit instruction for learning and building proficiency with new math content <u>first</u>.

After verifying students have learned the content, teachers can provide practice opportunities for productive struggle in which students work to generalize their learning to a novel, challenging problem or task (i.e., moving the 'struggle' from the beginning to the end of the instructional sequence).

[a]Brown & Campione (1994)
[b]Carlson et al. (1992)
[c]Kirschner et al. (2010)
[d]Kirschner et al. (2006); Mayer (2004); Steffe & Gale (1995)

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