

Theatrics vs. Mathematics

A Response to Dr. Jo Boaler

Sprints are the most powerful learning tool I've worked with during my 16-year teaching career. Still, I strongly support the research in Dr. Jo Boaler's, *Speed and Time Pressure Blocks Working Memory*. Although Sprint theory and Boaler's work might seem polarizing, I see them as coordinated, rather than mutually exclusive philosophies. Therefore, I was surprised to learn that Boaler criticized Sprints during an April NCTM presentation.

In her article, Boaler states:

The best way to learn math facts is to offer conceptual mathematical activities that help students learn and understand number relationships...those who learn through strategies achieved superior performance over those who memorized.

Her assertion complements the following:

Sprints, an invention of Dr. Yoram Sagher, are a learning tool designed to help students internalize skills and concepts, while developing their number sense through carefully sequenced simple to complex progressions. The best Sprints reflect well-scaffolded math lessons. All should be delivered after students have conceptually mastered its content.

Boaler encourages “understanding of multiplication as well as rehearsal of math facts.” A math card activity in her *Fluency without Fear* program involves students linking *four groups of 9 dots* to 9×4 , 4×9 , and 36. Because of this, I assume that she'd find value in the following Sprint sequence:

$$\begin{array}{|c|c|} \hline \cdot & \cdot \\ \hline \cdot & \cdot \\ \hline \end{array} + \begin{array}{|c|c|} \hline \cdot & \cdot \\ \hline \cdot & \cdot \\ \hline \end{array} + \begin{array}{|c|c|} \hline \cdot & \cdot \\ \hline \cdot & \cdot \\ \hline \end{array} = \underline{\hspace{2cm}}$$

$$4 + 4 + 4 = \underline{\hspace{2cm}}$$

$$3 \times 4 = \underline{\hspace{2cm}}$$

$$4 \times 3 = \underline{\hspace{2cm}}$$

$$\underline{\hspace{2cm}} \times 4 = 12$$

A Sprint would have several more analogous progressions that gradually increase in complexity, helping students gain confidence and develop existing skills. Regardless, both tools connect concepts through related answers.

Because *Fluency without Fear* and Sprint sequences are mathematically compatible, I assume Boaler dislikes Sprints because of its optional timed component.

The Sprint routine is designed to help students enter two separate states of cognitive flow with an intermediary practice session and stretch break in between. Finding ways to optimize the stages is left to the instructor's discretion. Some teachers time the activity, others don't.

Timing the practice serves two purposes:

- 1) A set amount of time can be a catalyst for generating student focus, because one minute is a realistic interval to intensively engage with written fluency. Extending the time leads to waning focus. Reducing it prevents students from maximizing their concentrated output.
- 2) Problem-by-problem, Sprints A & B are equal in difficulty. When teachers provide the same amount of practice time for each, students can measure their fluency improvement, which often builds self-confidence.

Regrettably, timed math practice often implies an emphasis on speed. Although some teachers frame written fluency this way, there is a significant difference between

generating cognitive flow through deliberate practice and equating rapid calculation with mathematical success. Sprints are meant to engage the former and teachers should relay this message to their students.

Boaler and other Sprint detractors often have good reason to arrive at their conclusions. Too often, the tool is introduced by trainers, who gloss over its theory without communicating its purpose or the mathematics behind it. As a result, many teachers deliver Sprints ineffectively and in the process, unnecessarily create timed pressure. But before dismissing Sprints as a stress inducing, ineffective learning tool, critics should consider the teacher's role in making it powerful.

The thoughtful practitioner knows that the greatest apprehension remedy is strong student/teacher relationships. When students feel loved and appreciated, they trust their teacher. Trust minimizes anxiety. Therefore, the teacher carefully considers the emotional impact of their learning activities and how they're presented.

The teacher also understands the importance of focused, deliberate math practice. When students work their way through simple to complex patterns with variations and challenges that stretch - but not overstretch - their skill set, they are likely to enter a pleasurable state of cognitive flow and practice effortlessly.

Knowing the power and subtle implications that words have, the educator judiciously names their activities. Instead of Sprints, they might call the tool *Slaloms*, because an initial energy thrust creates momentum for navigating twists and turns of complexity.

Constantly aware of their students' skill levels, the teacher selects appropriate written fluency practice. By choosing topics that *all* students have mastered, they further avoid math anxiety. Achieving this demands that they edit existing Sprints or write new ones. The process is arduous, but the reward is a classroom filled with happy, confident, successful children.

If Boaler studied Sprint theory, watched exemplary teachers deliver the tool, and analyzed children's emotional responses to the activity, I respectfully disagree with her conclusion. If her NCTM comments were based on abridged literature and/or sprint videos, I encourage her to study the link at the bottom of this page, demarcate between theatrics and mathematics, and consider a teacher's power to stimulate or eliminate anxiety.

<http://www.teacherbilldavidson.com/sprints/going-deeper>