LOCATING A PRODUCTIVE CLIMATE: MEASURING STUDENT COMPUTATIONAL FLUENCY IN A TIER 2 SYSTEM

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Instead of interventions that focus on direct instruction, number strings provide opportunities for students to engage in mathematical discourse, both in describing their strategies and connecting with the mathematical strategy of others. Research on number strings has found that students participating in number string routines can adopt new strategies (O'Loughlin, 2007) and make connections between conceptual understanding and procedures. Studies on number strings have not previously focused on students with disabilities or students who are significantly underperforming in mathematics, investigating this problem can provide information that could lead to solutions that improve computational fluency in multiplication and division. In particular, interventions for students with disabilities (Lambert, 2018; Lambert & Tan, 2020) within the Multi-Tiered System of Support (MTSS) in mathematics.

To explore student computational fluency, we designed a standard aligned number string intervention for students (N= 35) with disabilities ages 8 through 11 significantly underperforming in multiplication and division (Lambert, Mendoza, & Nguyen, 2020). A number string is a short (15–20-minute) daily instructional routine in which a teacher presents a carefully designed sequence of problems one at a time for children to solve mentally and modeling student thinking with a representation (Lambert, Imm, & Williams, 2017). Research question: What are the effects of a Tier 2 number strings intervention in multiplication and division for students needing additional support in these areas?

Findings

In order to assess whether student computational fluency improved after eight number string interventions and three iterations of the Multiplication and Division CCSS CBM Math Assessment. . Using a dependent samples t-test, students improved their scores after the 8 session intervention, $t(32) = 2.30$, p=0.028. (We used a dependent sample t-test since repeated measures were taken from the same sample). After the pre-intervention test scores (first iteration of the assessment) of ~29.10%, the post-test scores (3rd iteration of the assessment) increased to ~36.93%. This is a 26.9% multiplicative increase for all students.

References

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