The Impact of a Standards-based Grading Intervention on Ninth Graders' Mathematics Learning

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What is Standards-based Grading?

Typically, U.S. classroom teachers use some tests and assignments purely for summative purposes, recording scores indelibly to be used in a weighted average that determines final grades. In contrast, under a standards-based grading system the teacher uses such assessment evidence both to evaluate the extent to which a student is proficient in each of the course's learning outcomes *at that particular moment in time* (summative assessment), and then to provide students with personalized feedback designed to guide further learning (formative assessment). A key feature of standards-based grading is that students are then given opportunities to do further work, at home or in school, and to be reassessed for full credit. In other words, summative assessments become formative tools designed to promote further learning, not just markers of how much students have learned already.

How did we conduct this study?

We conducted a cluster randomized controlled trial, recruiting 29 schools and randomly assigning half (14 schools) to a Treatment condition, and half (15 schools) to a Control condition. Treatment schools implemented the standards-based grading program, called PARLO, in their ninth-grade algebra and geometry classrooms, and Control schools proceeded with business-as-usual. In our participating districts, instruction to learning standards and implementation of formative assessment were already commonly in use. Consequently, the PARLO program focused on implementing two necessary components of standards-based grading. The first was Mastery: students were rated as not-yet-proficient, proficient, or high-performance on each learning outcome, and final grades were computed using a formula based on the number of proficient and the number of high-performance learning outcomes. The second was Reassessment: after providing evidence that they had done further studying, any student could be reassessed for full credit on any learning outcome.

How did Standards-based Grading impact student learning?

The program improved student performance on end-of-course algebra and geometry tests by 0.33 standard deviations ($p < .014$), which would typically move a student scoring at the 50th percentile up to the 63rd percentile. We analyzed the data using a hierarchical linear model, adjusting for demographics and prior achievement.

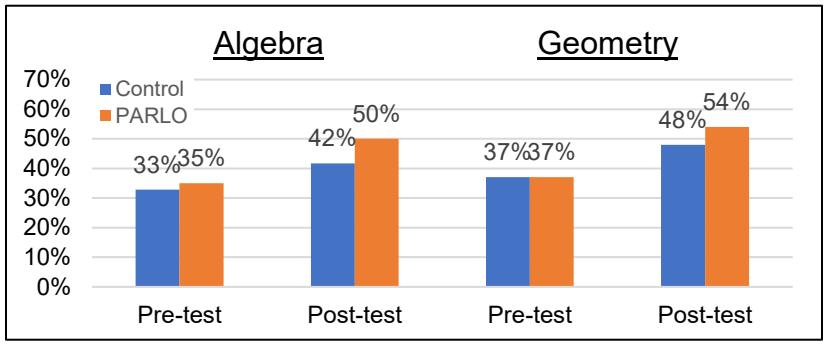

Chart notes: The chart displays, by subject area, raw percent correct on a course-content test administered at the beginning of the school year and on the same test administered at the end of the school year. Unlike the formal statistical analysis, the chart does not adjust scores for demographics, prior achievement, or clustering.

How did student motivation explain program effects?

Both qualitative and quantitative data indicated that, while the PARLO program was effective for all groups of students, it was especially effective for students with higher motivation. Future implementations might benefit from combining standards-based grading with interventions known to increase motivation, such as supporting students' sense of belonging in math class or connecting math learning to students' altruistic and/or personal aspirations.

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