

Redesigning Assessment for Growth in Mathematics for Elementary School Teachers

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Our institution is increasingly concerned with the success of students in their first-year courses, especially underrepresented minority students. As part of an institution-wide push to redesign courses with higher failure rates, we redesigned the assessments and grading scheme in our two-semester sequence of courses for future elementary teachers.

Literature and Redesign

The redesign efforts were aligned with the four pillars for alternative grading (Clark & Talbert, 2023), which include clearly defined standards, helpful feedback, marks indicating progress, and reassessment without penalty. Working backwards from revised course standards, we created methods of assessment that fell into four categories: skill checkpoints (in-class, written assessments), videos (short recordings showcasing a student's knowledge of how to teach math with manipulatives), and projects (longer, multi-week homework targeting broad skills).

Each assessment is graded as either a "pass" or a "not yet", with written feedback provided for each "not yet". Additionally, each assessment can be either revised and resubmitted or reattempted with no penalty to the grade. Letter grades were assigned based on the number of assessments passed, with cutoffs set for each letter grade in each category.

To assess the effectiveness and reception of this redesign, we asked the following questions: (a) is there a statistically significant difference in DFW rates between redesigned sections and non-redesigned sections, and (b) what are students' opinions about the new grading system?

Methods

Since 2023, the redesigned grading system has been used in 7 sections of the first course and 3 sections of the second course. Grade distribution data for sections of the course taught by the authors since 2022 was analyzed computing the pass rate for each section, defined as the number of students with a C- or better divided by the number of students enrolled.

In the fall of 2024, focus group interviews were conducted with 5 participants. The interviews were conducted by a third party. The participants were asked to reflect on their experiences using the grading system. End-of-semester course evaluations for the redesigned sections were also included in the analysis in order to cross-reference student sentiment.

Results

Comparing the pass rates with a t -test gave the following results: the mean of the redesigned sections is 0.617, the mean of the traditionally graded sections is 0.662, which was not a significant difference ($p=0.36$).

Qualitatively, students' opinions were divided. Some were positive about the reduction in anxiety enabled by reattempts. Others experienced more anxiety, as falling behind led to an ever-growing number of reattempts. Some praised the redesign for its focus on growth and understanding, while others felt that an all-or-nothing "pass" marking system was preventing them from succeeding. Students' receptiveness was impacted by the instructor's experience with the redesign.

References

Clark, D., & Talbert, R. (2023) Grading for growth: A guide to alternative grading practices that promote authentic learning and student engagement in higher education. Routledge.