The Homework Self-Evaluation Challenge

By Lee Stemkoski

Every semester, one of my greatest hopes is that my students will internalize the philosophy "we learn math by doing math." I explain to my students that this is why I assign homework regularly, and why I count homework averages significantly towards final grades. I also want students to use homework as an opportunity to "self-assess," to determine the extent of their understanding and of what remains to be learned. Unfortunately, calculating grades and giving useful feedback on all this homework requires a lot of time. Most advice I've read on reducing time spent grading (such as assigning points on a 0–2 scale, spot-checking random exercises, or randomly determining if exercises will be collected at all) would not help students identify or learn from their mistakes. Most of all, it saddens me to see students glance at the grade on an assignment, ignore the written comments I have made, and file it away forever.

While recently teaching Abstract Algebra, I attempted to address all of these issues simultaneously with the "Homework Self-Evaluation Challenge." For each assignment, I wrote and photocopied a detailed answer key, explaining how I would have graded and assigned partial credit for each exercise.

Students accepting the challenge for a particular assignment had the following responsibilities:

Photocopy their homework before class, hand in the photocopy, and keep the original.

Pick up an answer key and grade their assignment.

Before the next class, send me their grade via an e-mail with subject "Homework Grade" (or incur a significant grade penalty).

I informed students who accepted the challenge that throughout the semester I would be scanning the photocopied assignments to make sure that the grades they sent me were accurate. I also advised students to mark up their homework indicating where points were gained or lost, for the rare case of significant disagreement between our grades, necessitating a re-evaluation. Occasionally, students solved exercises in novel and unexpected ways, in which case I encouraged them to talk with me after class or during office hours if they felt they needed to discuss how to grade their solution. I graded non-photocopied homework (from students not accepting the challenge) using the aforementioned answer key.

Students accepting the challenge were awarded an additional ten points (out of 100) on each assignment they evaluated themselves. I explained that since homework exercises counted towards 33% of their final grades, accepting the challenge would often result in a "bump" in final letter grades (from a B to a B+, from a B+ to an A–, and so on). Furthermore, by retaining their current assignment, they could reference it during the next assignment if necessary. I also explained that the ability to evaluate work is an important skill not only for future teachers (the majority of Adelphi math majors), but for many careers. Whatever their motivation, 30 of my 35 Abstract Algebra students chose to accept the challenge on a regular basis. After first describing the challenge opportunity to them, it was easy to see their pleasure at the amount of trust I placed in them, and the pride they felt in becoming that much closer to self-sufficient learners. As a result, my students appeared to truly enjoy this activity.

I believe that the self-evaluation challenge helps students develop valuable skills, become more self-reliant and reflective, consider their solutions more fully, and view grades less as "externally assigned numbers" and more as a direct result of their own efforts.

In the past, I usually spent about 15 minutes sketching out a grading key for homework assignments so that my evaluations would be consistent. To make a grading key that is student-friendly requires about 15 additional minutes; about ten minutes are needed for photocopying grading keys and entering grades e-mailed by students.

Time spent: 40 minutes per assignment.

Time saved: In a class of 35 students, I typically spent two to three hours to grade each homework set, and so the time saved is around one to two hours per assignment, plus time saved from students with questions about how to correct mistakes and about why they received the grades they did.

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