Instructors Learn from Homework, too: 
Streamlining Data Collection to Facilitate 
Reteaching Before the Test 

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Instructors Learn from Homework, too: Streamlining Data Collection to Facilitate Reteaching Before the Test

The Need
Whether it's for accreditation or simply as a good teaching practice to inform future instruction, gathering and analyzing data can be time consuming. This is especially true for large classes. How can you streamline the process for quick evaluation?

Purpose and Process
Purpose: Reteaching is an important step in helping students to learn content they missed the first time. Process: In order to know what to reteach, you first need to gather and analyze data. Homework assignments are valuable sources of data, especially in calculation-intensive courses. Other formative assessments also provide useful data for reteaching.

Data-based Decision Making
Formative assessments (quizzes, discussion responses, homework, etc.) are key tools in understanding what students have learned prior to summative assessments (e.g., exams, projects). Unfortunately, these data are not always systematically gathered and analyzed to inform instruction. Without the intent to act, data gathering is simply a time-intensive task. Formative assessments benefit students and teachers (Buffum & Erkens, eds., 2009). A higher effect was seen for low-achieving students (Fuchs et al., 1997). Data-based decision making is a common strategy in education; however, implementation varies (Kerr et al., 2006).

Recent research shows beneficial outcomes from using data to make decisions (Wayman et al., 2006).

<table>
<thead>
<tr>
<th>Action</th>
<th>Time involved</th>
<th>Who does it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Prepare a template for recording and analyzing data</td>
<td>Once, 30-60 minutes depending on software proficiency</td>
<td>Instructor</td>
</tr>
<tr>
<td>2. Align homework problems with course objectives</td>
<td>Extra 10-30 minutes when preparing homework</td>
<td>Instructor</td>
</tr>
<tr>
<td>3. Extract data from homework</td>
<td>Depends on length and # of assignments</td>
<td>TA / Grader</td>
</tr>
<tr>
<td>4. Prepare report summary</td>
<td>15-30 minutes</td>
<td>TA / Grader</td>
</tr>
</tbody>
</table>

Figure 1. The Instruction-Assessment Cycle as presented by Conderman & Hedin, 2012.

Microsoft Excel Tutorials

Reteaching Before the Test
There are a number of opportunities to reteach a topic prior to a midterm or test. After returning homework, spend a portion of that class going over the topics identified in the report. Plan a review session or class and focus on the topics identified in the report. Skip the topics where students performed well.

Accreditation
Compare how students performed on topics at different stages (i.e., first exposure, midterm, final exam) in order to see growth over time and to show instructor effectiveness.

Mastery Learning
Combine this approach with mastery learning and allow students to complete similar assignments or tests. Show the students their growth over time to provide motivation for learning.

Flipped Classroom
In this approach, students watch videos, read, or receive instruction outside of the classroom, and then class time is used to engage more deeply with the content. Quizzes outside of class can provide instructors with data to reteach a topic before moving to higher levels of learning (i.e., analysis, synthesis, evaluation).

Using Data to Make Decisions