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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 practice and the need it addresses

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.

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

Evidence this practice benefits UNLV Students

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).



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

Resources and where to find them

Microsoft Excel Tutorials

Lynda.com

Free access through UNLV ACE account

<https://www.lynda.com/learning-paths/Business/improve-your-microsoft-excel-skills>

Course Name	Homework ## (Date)								Maximum points = 27	
	5	3	3	3	3	4	4	3	Points	
STUDENT NAME	A1	A2	A3	B1	B2	B3	C1	C2	Total Score	
A	5	3	3	3	3	4	4	2	27	
B	5	3	2.5	3	3	4	4	2	26.5	
C	5	3	3	2	3	4	4	2	26	
D	5	3	3	2	3	4	3	2	25	
E	5	3	3	2	3	4	4	2	26	
F	5	3	3	2	3	4	4	2	26	
G	4	2.5	3	2	3	4	3	2	23.5	
H	5	2	3	2	1	4	3	2	22	
I	5	3	3	3	3	4	4	2	27	
Avg	4.89	2.83	2.94	2.33	2.78	4	3.67	2		
Median	5	3	3	2	3	4	4	2		
%	98%	94%	98%	78%	93%	100%	92%	67%		
	≥90%	≥80%	≥70%	≥60%	<60%					
	A1	Objective 1a	B2	Objective 2b						
	A2	Objective 1b	B3	Objective 2c						
	A3	Objective 1c	C1	Objective 3a						
	B1	Objective 2a	C2	Objective 3b						

Using Data to Make Decisions

Kathryn Parker Boudett, Elizabeth A. City, and Richard J. Murnane (editors). **Data Wise: A Step-by-Step Guide to Using Assessment Results to Improve Teaching and Learning**. Cambridge, MA: Harvard Education Press. 2005

Kim Schildkamp, Mei Kuin Lai, Lorna Earl (editors). **Data-based Decision Making in Education: Challenges and Opportunities**. Boston, MA: Springer Science & Business Media. 2012

How other UNLV teachers might adopt this practice

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).