Low-Stakes & Quick-Feedback Assessment in STOR155

STOR155:

*Level:* Introductory undergraduate service course (pre-requisite: MATH110)

*Clientele:* Prospective majors in business/economics/pre-med/etc.

*Class Size:* 100+ per section (2 sections in Spring 2015; 2 sections in Spring 2016)

*Class Meeting Schedule:* T/Th 75-minute class period

*Class Meeting Format:* Lectures incorporating interactive EXCEL demonstration spreadsheets

**Objective:**

*Motivate students to stay engaged & up-to-date with the current material*
Traditional Model:

**Homework:**
Assigned weekly (or even daily with each lecture)
Due/Collected weekly (or even daily at the next lecture)
Graded by TA (1-week turn-around at minimum; quality of feedback)
9-day lag / 3-lecture lag (between introducing new material and feedback)
  - can be even longer, especially if homework is assigned/collected weekly
Even with daily assigning/collecting….
  - does not motivate serious preparation prior to class meeting
  - does not motivate in-class attentiveness/engagement

Collaboration (OK up to a point) / Copying (not OK)

Additional practice exercises not readily available

**Midterm Exams (1 or 2):**

Studying: cram + forget

Stress: high-stakes (20%, 25%, 30%); many courses give exams near the same dates

Timing (too late): no serious assessment/feedback until mid-semester

Disrupts the flow of course material: in-class review day; exam-day; post-mortem day
Low-Stakes & Quick-Feedback Assessment Model:

Made possible only by modern technology: WebAssign platform

Extensive flexibility under the Instructor’s control

- times/dates when assignments/quizzes appear and disappear
- many types of questions/responses (fill-in, multiple-select, multiple-choice, etc.)
- set the accuracy/tolerances for grading the responses
- allocate point-values per questions (or parts)
- automatic grade-book recording & computations (with weightings)
- multiple attempts at responses can be allowed without penalty
- instantaneous feedback to student and to instructor
- submit responses “one-part-at-a-time” (midstream feedback helps with later parts)
- practice-another-version available to students (not graded)
- individually randomized questions for each student

Homework, Quizzes (“Entrance Quiz” and “Exit Quiz”), Final Exam
**Homework:**
Assigned daily (after each class meeting)
Due at the start of next class meeting
Multiple attempts at responses are allowed (usually 4 or 5 attempts on each question/part)
Immediate feedback to students and to instructor
Office Hours & Tutorials are available between date assigned and due-date
Collaboration-OK, but copying is prevented by the individual randomization feature
Unlimited practice versions of exercises are available (after due-date)

27 Homework Assignments (equal weights), worth 30% of semester grade

**Quizzes:**
Daily “Entrance Quiz” and “Exit Quiz” (all with open resources)
Entrance Quiz –

- 10 minutes at the start of each class meeting
- students arrive punctually
- motivates serious preparation prior to class meeting
- emphasis on recent material/homework, but inherently cumulative content
- students are up-to-speed for learning today’s new material
- only 1 attempted response (per question/part) is allowed
- immediate feedback to students and to instructor
- copying/cheating is prevented by the individual randomization feature
- 27 Entrance Quizzes (equal weights), worth 30% of semester grade
Exit Quiz –

- 5 minutes at the end of class meeting
- students do not pack-up early
- motivates in-class attentiveness & engagement
- content: purely on the basics of today’s new material
- only 1 attempted response (per question/part) is allowed
- immediate feedback to students and to instructor
- copying/cheating is prevented by the individual randomization feature
- 27 Exit Quizzes (equal weights), worth 20% of semester grade
Final Exam:

- WebAssign, similar format to Homework & Quiz questions
- cumulative content
- closed resources (except for EXCEL allowed)
- only 1 attempted response (per question/part) is allowed
- immediate feedback to students and to instructor
- copying/cheating is prevented by the individual randomization feature
- Worth only 20% of semester grade (relatively Low-Stakes for a Final Exam)
Daily Quiz Schedule vs. Midterm Exams:

Build up your grade (and your knowledge) cumulatively in small steps

No high-stakes exams

No rote memorization/regurgitation for quizzes (open-resources)

Just learn & recognize the thought processes / steps of solving problems

Become accustomed to the daily routine of 2 quizzes

(rather than 1 or 2 “special” stressful Midterm Exam days)

In-Class Time per semester:

Entrance Quizzes + Exit Quizzes = 405 minutes

2 Midterms (with review class & post-mortem) = 450 minutes

Outcomes:

Compared to my students in the previous traditional version of STOR155 –

- students in this course mastered topics that are more sophisticated

- these students also earned higher semester grades (overall average = 80)

Strong feelings among students regarding the time-pressure during quizzes

Most students adapted to the daily quiz routine, some even appreciated it

Some students found daily quizzes stressful throughout the semester (in spite of low-stakes)
Resources / Costs:

Students pay for WebAssign account (either linked to textbook, or not)

Can eliminate the departmental expense of paying TA/grader, or….

Can reallocate the TA’s time to offer additional Office Hours / Tutorials for 1-on-1 help

I.T. Glitches:

WebAssign site crash (rare)

Individual student computer / WiFi malfunction (occasional)

be lenient – unless it becomes a habitual excuse

Writing/Refining the WebAssign Questions:

More than 250 WebAssign questions (often multi-part) were developed

Learn WebAssign syntax & options

Learn PERL

Spend a few hundred hours….
“Law of Unintended Consequences”:

(especially as it relates to contextualized grades on transcripts)

Provide early & serious assessment and feedback to students

Students make an informed & realistic decision to drop course  

    (instead of unrealistically hanging on, ultimately to get D or F)

Most D & F students have bailed from the semester grade distribution

    - “cheapens” the A, B, C grades of the remaining students, by making the course look “easy”