Rutgers College Teaching II: Assessment and Feedback

David L. Duncan

Preliminaries

A. *What is assessment?* To answer this, consider the following example: Suppose a student goes in to take an exam. When does the assessment process end? The moment the student has handed in the exam? After you first looked over the exam? The moment you finished grading? When you handed the exam back?

You want students to learn. We will take *assessment* to mean the measure of (or process of documenting) student learning. This is distinguished from *feedback*, which involves giving some of this information back to the student. Determining grades can be viewed as a (very narrow) form of assessment, while giving grades can be viewed as a (very narrow) form of feedback.

In the opening example, by "assessment" is the process of giving and looking over the test in some sense. "Feedback" means the comments you write on the exam, or the conversation you have with the student afterwards. "Grades" means the numerical (or letter) score at the top of the exam.

B. *Why assess?*

- It gives *students* feedback of where they sit in the class. Ideally, this helps them to fine-tune their approach to the class to help them learn more (which you want), and thereby get a better grade (which they want).
- It gives *you* feedback of what they know, what they have learned, etc. This allows you to fine-tune your teaching methods.
- It can be a learning tool. (It encourages your students to study!)
- In the end you typically need to assign a final grade!

C. *Assessment Methods*

- essays
- short response questions
- multiple choice questions
- papers (take home)
- exercises (e.g. math problems)
- group work
- quizzes
- 'sixty-second quizzes'
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Also: presentations, portfolios, pop-quizzes, ... Note that some of these assessment methods (e.g., essays) are rarely used outside of academics, and most of our students will not return to academics after graduating. When appropriate, use other genres to assess writing, critical thinking, etc.: a letter to the editor, a briefing for an employer, a review of an article, a proposal of funding, an explanation to a more novice person.

Homework 1. *Ask yourself which methods are best for your class. Fill in the Assessment Methods List (see below) accordingly.*

You should keep in mind the following: course content, learning goals, need for statistically significant data, etc.[1] *Rule of thumb: Use several different assessment types to ensure that your conclusions are valid, reliable and fair to a diverse population of students.*

How to Assess Effectively

A. Determine *what* you want to assess.

- What are your learning goals?
- Do you want to assess them on the basic facts of the course, or on critical thinking?
  - Basic facts: Who is Agamemnon? How does Odysseus escape Calypso?
  - More in depth: What kinds of roles do women play in the Odyssey? Provide examples from Helen in 3 and 6, and Andromache in 6 that support your claim.

B. Does your exam (paper, etc.) actually assess what you want?

- Identify the learning goals for your course (i.e., the skills you want your students to walk away with). Also, identify the concepts that you have covered in class. Which concepts are most important, and which are more peripheral? Which ones accomplish some of the learning goals, and which do not?
- Make a rubric for yourself and be sure it reflects the overall learning goals for the class. Actually, make two rubrics: one for the students, and one for you. The one for the students is so they know how they will be graded, and know what is expected of them. The one for you can be more detailed than the one for the students, and will be used for the grading itself (typically, more detail = easier to grade). Write these as you write your exam.
- Common pitfalls and how to avoid them:

  a. The students are not expecting the exam you give them, so they have not studied effectively. For example, if you have always given them easy quizzes, they may think the exam will be easy. To let them know what to study for, you could give the students a practice exam a few days before. (This also gets you to write the test early, and the students' feedback can help you gauge whether a particular question is appropriate for an exam.)

  b. Vague questions: Be sure to develop clear instructions and make expectations explicit: use words such as

     defend, explain, argue, illustrate, and *predict*,

     rather than

     discuss, comment on, or *react to*.

     Beware that these words are not fix-alls. Here are some bad and better examples, which are taken from [1, Chapter 11]. Bad examples:

     - Comment on the quote by Flaubert: "The author in his work must be like God in the universe, present everywhere and nowhere visible".
     - The most important metaphysical idea in Taoism is _____.

     These do not do a good job of telling the student what you are looking for in the first case, and to what extent there is an objective answer, in the second. Better examples:

[1] See chapter 11 of [1, Teaching First-Year College Students] for more details, as well as a defense of the multiple choice and essay questions.

- Consider the following quote by Flaubert: "The author in his work must be like God in the universe, present everywhere and nowhere visible". Comment on the extent to which the author accomplishes this in the following passage.
- The most important metaphysical idea in Taoism is _____. Defend your answer using *specific examples* from the reading and class discussions.

c. Questions that require more knowledge than meets the eye, or gives certain students an advantage:
   - (In an intro calculus course.) Prompt: *Find the area under the graph of* $f(x) = x^3$ *from 0 to 1.* I want to test their understanding that to calculate area they need to use an intergral:
   $$\text{Area} \to \int_0^1 x^3 \, dx.$$
   Perhaps the students don't know what the graph looks like. Perhaps they don't know what it means to be 'under the graph'. Think about maybe giving them the graph of the function, rather than *having them* come up with a graph. (Whether you provide a graph should depend on the learning goals for your particular class).
   - (In a classical literature class.) Prompt: *What kinds of roles do women play in the Odyssey?* Where should they look? Do they have a book? If so, is it alright for them to choose from everything? If not, perhaps consider providing passages.
   - (From [1], giving a statistics exam.) Prompt: *Calculate the probability of getting a certain poker hand.* This gives any student who knows about poker an advantage over students who do not (their neural connectivity and response about this subject is far higher than for people who are not familiar with poker).
   - (In a math/physics/engineering class.) Prompt: *Suppose a radioactive material decays with a half-life of* k *seconds. If there were* M *grams originally, how many grams would remain* t_0 *seconds later?* Compare this to: *Suppose a radioactive material decays with a half-life of* 3 *seconds. If there were* 5 *grams originally, how many grams would remain* 7 *seconds later?* The first demands more symbolic manipulation. Have your students been practicing this in their homework? Or have they always been dealing with concrete numbers? The exam should match what you have been discussing in the course.

   In the end you need to at least be aware of the aspects with which they will have difficulty.

   Activity. *Write down two questions that may appear on an exam in an introductory class that you might teach. One question should be a bad question, and the other should be a better questions. Discuss this with a partner in a related field.*

C. After writing the exam:

- Proofread.
- Put it down for a few days and proofread again!
- Take the exam yourself.
- Have a peer (fellow teacher/TA) take the exam. Use a timer. (In college calculus classes, the rule of thumb I use is to take the amount of time it took for a peer to take the exam, and then multiply this by 5. This is how long it will take the average calculus student.)
- Use the practice exam as a debugger. That is, write your exam, and then vary it a little to form a practice exam. Give the practice exam to the students to use as a study guide. Then watch to see where they are struggling, and if you have written a question that is somehow inappropriate. (Having the students proofread their own exam before you give it to them!)

D. Give clear and explicit instructions.

- Provide the students with a rubric when assigning take-home projects.

- Provide the students with a rubric for an essay question on the exam.

E. To grade, or not to grade...: Exams are not only used for *evaluating* student learning, they can also *encourage* it (they force kids to study!). Even if you don't grade everything (e.g., if you have a very large class), the students may still learn from the process.

- Ungraded in-class quiz.
- Sixty-second quiz: Take sixty-seconds to write down the key concepts which were covered that day in class. This will help them remember what was discussed.
- You don't need to grade every paper either. Just having them write can be a learning experience.

F. Self-assessment.

- Ask students to reflect on their learning styles: Which work and which do not? How can these learning styles be improved? What do you think the most challenging aspects of this course will be for you?
- Group projects: Have students submit minutes of meetings to get a feel for who is contributing what and how much. Also, use peer-reviews and self-assessment (on same form so they can contrast and be more honest). Ask what they have contributed, and how they would rate these contributions. What would increase the effectiveness of the group?

G. Prevention against cheating.

- Scramble test questions so neighboring students have a difficult time copying. (Make 2-4 copies of the exam.)
- Scramble possible answers on MC questions.
- Try to avoid asking questions in one place that answer questions in another place. (Test each big concept once per exam, if possible.)

Homework 2. *Construct a first mid-term exam for a course you are likely to teach. This should be done after you have designed a syllabus for the course.*

Analyzing the Results

A. Statistics

- Mean, median and standard deviation. Use both mean and median to interpret your own data. It is possible for no one to get the mean, but when you think about the median you always have at least one person in mind. On the other hand, there may be many outliers, so the median alone isn't good enough. In the end you want a good distribution. If this is not the case, then something went wrong, and you need to fix it next time. Best thing: graph the results. This gives you an actual picture. When assigning grades, only look at the scores (not the student names attached to them) and draw cut-off lines there. Only afterwards look at who they correspond to.
- When assigning grades, compare with some baseline (e.g. other courses with similar exams, previous courses). Ask: Would this person get an A in my class last semester? This is a good way to decide how you should scale the scores, if at all.

B. In retrospect: Did your exam (paper, etc.) actually assess what you wanted?

- Were there any additional issues that arose while grading?
- Were there any questions that over half of the class missed?
  - Was this unclear in lecture?
  - Was there a poorly worded question?

- Interview a few students to find out what they thought.
- Have a peer look over the question.

C. Did they learn what you wanted?

Giving Feedback

A. Grades

- The more data the better for determining a final grade. This means as many diverse assessments as possible.
- However, you don't have to grade everything.
- Report statistical data to the class: mean, median, and standard deviation. Better: show the class a rough distribution of the grades. (For example: this many people received A's, this many people received B's...). If possible, discuss how this data compares to the average class.

B. Give written comments when possible!!!

- Be specific!!!!
- Dont just say 'Good Point!'. Go beyond this and explain why it is a good point: 'The transition sentences work well to tie one paragraph to the next'. (Note the lack of use of 'I like...', which makes it sound as if they may not have received the same grade in another class.)
- Some students don't even know if they are doing something correctly. Identify accomplishments, don't let them think that they got the grade they did by agreeing with you or because they got lucky.

C. Confront struggling students.

- Talk to them ASAP.
- This gives them time to improve, or make other timely decisions (like drop the class).
- Ask them to come to office hours, or to talk to you after class.
- Send them an email.
- Send them a warning using REGIS.

D. Other Items:

- Give them a midterm assessment of you! (I found this even helps the students to warm up to me.) Ask them to reflect on activities that they thought were particularly relevant, surprising, puzzling, encouraging. How was the midterm? How is the pace of the course? Are the homework levels at an appropriate level?
- Build in opportunities to take make-up exams or rewrite papers. More generally, ask students to reflect on an exam after it was given. This keeps them from just dumping all of the information immediately afterward.
- Tell the students *how* to study for the class. What would you do that they might not think to? How do you study for this particular class? Of all the information available, how do you identify certain things as the most important?

References

[1] B.L. Erickson, C.B. Peters, D.W. Strommer. *Teaching first-year college students.* Revised and expanded edition. Jossey-Bass, 2006.

[2] P. Filene. *The joy of teaching: a practical guide for new college instructors.* UNC Press Books, 2005.

Assessment Methods List

	Pros	Cons
Essays		
Short Response Questions		
Multiple Choice Questions		
Papers		
Exercises		
Group Work		
Quizzes		
'Sixty-Second Quizzes'		

Sample Rubric (Figure 8.2 from [2])

Criteria for a Successful Essay:

1. Focus on the issue. (Does the writing deal with the problem?)
2. Evidence. (Does it support its position with adequate data?)
3. Coherence. (Does the argument hold together and move forward?)
4. Scope. (Does it deal with the important aspects of the problem?)
5. Originality.

Grades:

A = Excellent on all;
B = Above average on four items, or excellent on a few and flawed on the others;
C = Average across the board, or above average in part with significant flaws in the rest;
D = Below average across the board.

Sample Mid-Semester Evaluation

Lecture:

1. In general, do you find that the lectures help you understand the material?
2. Would you prefer more, or less examples?
3. In general, how do you find the overall pace of a given lecture? Are they too slow? Too fast?
4. If you could change one thing about the way I run the lectures, what would it be?

Workshops:

1. In general, do you think the workshops help you understand the material?
2. How do you find the difficulty level of the problems? Are they too challenging? Not challenging enough?
3. How well do you feel the workshops tie in to the rest of the class?
4. Do you think it would be worthwhile to spend more time going over solutions to the workshop problems?

Homework:

1. In general, do you think the homework helps you understand the material?
2. How do you find the difficulty level of the problems? Are they too challenging? Not challenging enough?
3. How well do you feel the homework ties in to the rest of the class?
4. Do you think it would be worthwhile to spend more time going over solutions to the homework problems?

Other:

1. What is your overall opinion of this course?
2. Which of the following do you find to be most conducive for learning in this class? Lecture, homework, workshops, or other (e.g. a tutor, additional studying at home). If other, please specify.
3. What do you like most about this course?
4. What do you like least about this course?
5. Do you have any additional comments or questions?