Designing a Final Exam

As described by the Berkeley Center for Teaching and Learning, “the worst final exams can seem unfocused, determined to test everything, or random things. The best final exams are learning moments.”

To make sure your final exam is a learning moment, start early – include a set of learning objectives in your syllabus and review them at the beginning of the semester. The September issue of Best Practices provided a guide for developing learning objectives and their assessments. These learning objectives will form the basis for your exam.

What should a final exam measure? Walvoord and Anderson believe that they should measure what instructors “value most.” To do this, the McGraw Center for Teaching and Learning provides some points to think about when designing a final exam. Exam questions should:

- Have a context
- Be creative
- Pose complex problems
- Require students to “integrate course skills and knowledge”
- Measure both disciplinary skills and content knowledge
- Be cumulative
- Require students to “make connections among various concepts or ways of thinking”
- Include a self-assessment component – require students to evaluate their own intellectual growth over the course of the semester.
- Have grading criteria based on professional standards – “Reward what your discipline rewards.”

Rob Weir, in a post for Inside Higher Education, offers some additional do’s and don’ts:

- Don’t experiment with your final – stick with the methods you’ve been using to evaluate student work throughout the semester
- Make the final harder than earlier exams – final exams should have a cumulative aspect and students should be expected to demonstrate mastery of the material
- Use multiple measurements to get better results – avoid tests that use only one method of evaluation. A combination of methods, for example a test that includes both short essays and multiple-choice questions, will more accurately represent student learning.

When beginning to design your final exams, the Berkeley Center for Teaching and Learning suggests the following steps:

- Review what you’ve covered in the semester and why you’ve covered it. Rank the material into three categories – ‘vital,’ ‘nice to know,’ and ‘can get by without.’ Determine how you will test the ‘vital’ material.
• Consider asking students to develop exam questions – this will engage them with the material, find out what they think were the most important or relevant course concepts, and encourage them to think about the course as a whole.
• When you’ve composed a draft of your exam, take it yourself and time how long it takes you to complete. If possible, have another person take the exam for a test drive to see if the instructions are clear and the questions unambiguous.
• Revise the draft with the exam’s layout in mind – can things be made more clear or concise? For example, “with essay questions, we blend what we intend to be helpful background with the question itself, and students have to hunt for the question. Instead: put the background in one paragraph, and label it as such. Then put the question on a separate line.” Make sure the value assigned to each part of the exam is clearly and prominently stated.
• When it’s close to exam time, review the exam format with students. Provide pointers for studying and make your expectations clear. If possible, provide students with practice exercises or examples of excellent answers.
• After the exam has been graded, take a look at the results – were there some questions that were more problematic for students than others? Is there evidence that phrasing or format, rather than the content, confused students? Think about ways the exam could be changed and make notes of these ideas for the next semester.

Consider alternatives to the traditional final exam

As described by the University of Minnesota’s Center for Teaching and Learning, students will “vary the way they study depending on how they think they will be tested… if students think they will be tested on details, they'll spend their time memorizing. If they know the test will ask them to apply theories and concepts to unique problems and situations, they'll practice this skill” instead. It is important to think about how what format of final exam can test what we truly wanted students to learn. With that in mind, the Center for Teaching and Learning suggests some alternative formats to the final exam:

• **Open book exams** can allow students to focus on the application of their knowledge, rather than on memorizing course content.
• **Crib sheets** require students to carefully construct notes, think about what concepts are the most crucial, and rephrase material in their own words.
• **Take home exams** make it possible to give students much longer problems that require using a variety of references or resources to answer. They will always be more problematic to implement because of issues of academic integrity.
• **Collaborative testing** encourages students to discuss the material and teach each other. Collaborative testing works best at testing critical or creative thinking. There are several formats that this can take. Students can be allowed to discuss the test in pairs or small groups, but then turn in individual answer sheets. Alternatively, the group could be required to come to an agreement on answers and hand in one answer sheet, with each group member receiving the same grade.
• **Portfolios** allow students to collect together their most successful work, regardless of format. Combined with a reflective statement in which students describe how their work demonstrates their growth over the course of the semester, portfolios can provide a fuller and fairer picture of student achievement.

• **Performance tests** require students to demonstrate their knowledge by completing a complex task while the instructor observes and evaluates their actions. This type of assessment requires a lot of careful planning and time.

• **Multiple-choice questions with space provided for explanations** give students the option to provide a rationale for their answers, or to indicate how depending on interpretation, more than one answer could be valid. While this method might increase grading time, it also decreases student anxiety, and “often prevents penalizing the ‘good’ student for interpreting the question at a deeper level than was intended.”