A forum for the discussion of teaching enhancement, provided by the UW-Madison Teaching Academy

The Learning Link

In This Issue

This issue of The Learning Link offers a cross-section of reflections on classroom assessment issues at UW-Madison. Responses and submissions are welcomed and encouraged; please see page two for contact information.

Helpful Tips for Creating Reliable and Valid Classroom Tests: Writing Multiple-Choice Questions

The first article in this series introduced the test blueprint as the initial step involved in building a reliable and valid classroom test. Blueprints are important because they help identify the particular course objectives that you want assessed, and identify the relative weight to be assigned to each. Once this blueprint is developed, the next step is to write the test questions to measure the intended objectives.

There are many different types of test questions, and depending on the purposes of the test and the specific objectives being measured, a single test will often utilize a variety of different item types. One of the most popular item types is the multiple-choice (MC) question. There are three main reasons to include MC items on exams. First, MC items are very easy to score because they are written to have one and only one unambiguously correct answer. Answers for MC items are simple enough that they can be scored by machines quickly and accurately, allowing instructors to return exams to students with little delay. A second reason to use MC items is that they allow instructors to sample a wider range of content than they would using other item types. Students can read and answer most MC items in about 45 - 60 seconds, thereby allowing instructors to ask questions about many topics in relatively little time. Furthermore, longer tests and tests that more completely sample the important content are known to have higher test reliabilities. Finally, MC items are popular because they are very good at what they do. MC items are often criticized for testing only lower-level thinking. It is true that MC items cannot measure the highest levels of thinking on Bloom's Taxonomy (e.g., synthesis or evaluation), but MC items can be written to measure relatively complex ideas and are very good at measuring basic understanding. Over-reliance on assessments comprised of exclusively MC items might preclude one from measuring whether students have a deep understanding of the course objectives, but within most courses, there is some room for assessing students' more fundamental understanding of the material.

(continued on page two)

Multiple Choice Questions

(continued from page one)

Although many are drawn to MC items because they are efficient to score, one must realize that MC items are not efficient to write. In fact, MC items are probably the hardest item type to write well. Perhaps this is because MC items tend to focus on more basic, less complicated material that many students already know. Perhaps this is because many students will be able to recognize the correct answer when they see it, even if they couldn't have produced it on their own. However, the biggest reason that it is difficult to write good MC items is that it is difficult to simultaneously present a problem that students completely understand and present multiple incorrect solutions that less knowledgeable students think are viable.

Learning how to write MC items well takes several years, and there are many books available on the subject. Since space here is limited, below are a few of the most important rules to keep in mind for improving the quality of MC items.

1. *Each item should be as short, clear, and verbally uncomplicated as possible*. Give as much context as is necessary to answer the question, but do not include superfluous information. Be careful not to make understanding the purpose of the item a test of reading ability. Make sure that the students do not have to guess what you are really asking.
2. *Make sure that correct answer is really correct* (and not simply the best of the alternatives), and that a context does not exist in which one of the incorrect alternatives (i.e., distractors) is acceptable. Make all distractors plausible and attractive for students with little or partial knowledge. It is often useful to use popular misconceptions and frequent mistakes as distractors.
3. *Keep each item independent from other items.* Don't give the answer to one item away in the question or alternatives of another item.

(continued on page three)

Editor's Note

In the April issue of The Learning Link, contributing author Anne Lundin from the School of Library and Information Studies was incorrectly identified as an Assistant Professor. Her correct title is Associate Professor. The Learning Link staff apologizes for any confusion or inconvenience this may have caused.

The Learning Link is a quarterly newsletter published by the University of Wisconsin-Madison Teaching Academy. It aims to provide a forum for dialogue on effective teaching and learning. University teaching staff, including graduate teaching assistants and undergraduate students, are invited and encouraged to submit contributions.

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4. *Avoid testing multiple objectives with one item.* Students can miss these items for multiple reasons and you will not know which concepts are being misunderstood.

5. *Avoid negatively stated items.* The most common reason for using negative wording is that the test developer was unable to think of good distractors to use without resorting to negation. The use of negatives is often confusing and adds an unintended dimension to the construct being measured.

6. *Avoid trickery.* We are often tempted to try to increase the difficulty of questions by imbedding little tricks and unexpected things into the alternatives that require a very sophisticated reading to recognize that they are wrong. The basis for a trick is that the structure of an item sets up an expectation for what the student should see in the alternatives. That expected response is then given, except for one very small change that makes it incorrect. These items should always be avoided. Much as we might like our students to be able to find these subtle but important errors, students do not have an unlimited amount of time on the test. We don't want students who would have gotten the item right if it were a short answer question to get it wrong in MC format simply because they didn't read quite carefully enough or stopped reading the alternatives after they found what looked to be the right answer.

7. *Avoid including clues that allow students to eliminate distractors.*

   - Make sure that all alternatives are grammatically and logically consistent with the item stem (e.g., if stem ends in "an," make sure alternatives begin with a vowel).

   - The length, explicitness and technical information in each alternative should be parallel. In particular, don't make the correct answer longer or more detailed than the distractors.

   - Don't repeat words between the item stem and correct answer. It can be done, however, to make distractors more attractive.

   - Distractors should not be synonyms or overlap in meaning. As they cannot both be correct, students will know that they must both be incorrect. By similar logic, distractors should not be subsets of one another.

   - Avoid terms such as "always' or "never,' as they generally signal incorrect choices.

   - Try to avoid "all of the above" as a last option. If an examinee can eliminate any of the other choices, this choice can be automatically eliminated as well.

   - Avoid silly distractors that will be discarded immediately by everyone. Students spend needless time reading them, sometimes multiple times, just to make sure they aren't missing something.

Writing good MC items is very difficult. One aspect that complicates matters is that it is often difficult for the item writer to judge the extent to which an item satisfies the criteria given above. If possible, it is usually best to have a colleague or TA review your items before administering them, to see whether they are sufficiently clear and to identify and repair any problems that may be identified.

As mentioned previously, MC items are just one type of item. In the next article in this series, I will introduce some other common item types and will provide some strategies for developing and scoring these items. For more information on test development, please check out Testing & Evaluation (T & E) Service's website at http://www.wisc.edu/exams or call or come to T & E (373 Educational Sciences Bldg., 262-5863) and ask to talk with someone about help on developing classroom assessments.

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UW-Madison, September 2003