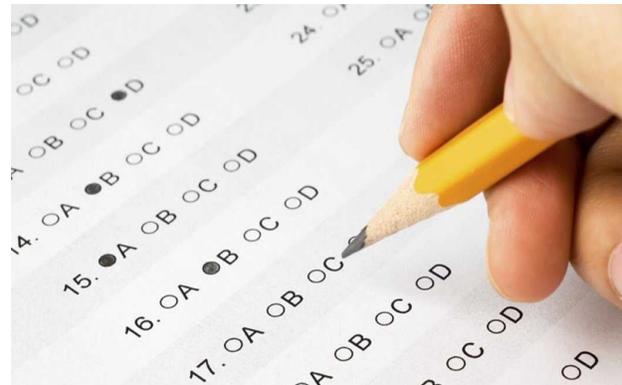


Teaching Tip 12: Developing Good Multiple Choice (MCQs) Questions

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This tip focuses on multiple-choice questions MCQs. Multiple-choice questions are commonly used for formative feedback (see teaching tip 9), quizzes, and on summative exams, especially when the number of students taking the exam is large.

Multiple-choice tests have several attributes that make them attractive; they are easy to administer and grade, questions can be obtained from the publisher or Internet test banks, students are comfortable taking MCQ exams since they are the standard format for high-stakes placement exams, and students prefer MCQ exams since they believe that they are easier, amenable to a memory-based study approach and allow the opportunity to



guess. In contrast, constructed response questions (short answer or essay) require students to construct answers and can more easily assess higher order cognitive knowledge and skills. Constructed response questions are easier to write but more difficult and time consuming to grade. One limitation of MCQs is often they failed to measure deeper understanding and assess only the lowest levels of Bloom's taxonomy e.g. surface understanding. There is a significant body of literature on how to design and write good MCQs, one need only search "multiple-choice questions" to access a number of guides. An easy to read recent publication is by [Xu and Tupy, 2016](#)¹ provides helpful background information and advice.

Here are a few suggestions to make writing MCQs easier and more effective at measuring student performance.

Use three-choice items questions. Questions which have four or five choices are no more effective in assessing student understanding than a three-choice format. Three choices questions are easier to write, allow for more questions per exam or more time per question. Be sure each of the choices have the same structure and length. Avoid questions that use negatives either in the question stem or in the choices, also avoid choices such as; "all of the above", "none of the above" or "combination or composites" such as "A and B", "A and B but not "C". Clearly state the students are to select the most correct answer, this reduces students complaining and allows one to include partially correct answers in the choices, which increase understanding discrimination.

Check the questions to see which levels of Bloom's taxonomy are assessed. Writing good multiple-choice questions that assess higher levels of Bloom's taxonomy is possible but challenging, and well worth the effort.

Check the alignment of the questions with the learning outcomes of your course, ask yourself which learning outcomes are assessed and at what level? Are the MCQs consistent with what was covered in the course and not focused on a subset of lectures or concepts.

Do an item analysis to see which questions the majority of the students got correct, which only a few students got correct, and those in which one of the incorrect answers was the predominant selection. There are a number of software applications which will automate this process once the data has been collected for each question and many automatic grading e.g. software routinely provide this data. I generally throw out questions where more than 50% of the students select an incorrect choice.

Finally, but importantly have a colleague or teaching assistant proof the exam and if possible, take the exam marking those questions they feel are unclear, tricky, or trivial and record the time it took them to complete it. Generally, if they can complete the exam in one third of the allocated time then the length is probably appropriate.

¹Xu, Xiaomeng & Kauer, Sierra & Tupy, Samantha. (2016). Multiple-choice questions: Tips for optimizing assessment in-seat and online. *Scholarship of Teaching and Learning in Psychology*. 2. 147-158. DOI: 10.1037/stl0000062



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