

# TIPPING POINTS

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· i n n o v a t i o n c e n t r e ·

## MULTIPLE-CHOICE TESTING

Ruth.Rodgers@dc-uoit.ca · <http://innovation.dc-uoit.ca> · 905.721.2000 Ext. 2540

### Basics

Most post-secondary multiple-choice test items are designed to assess the students' cognitive abilities at an introductory level of understanding. Students are presented with a number of possible answers to a content-based question, and are required only to recognize the correct response, which is often a word-for-word quote from the text or lecture. In terms of Bloom's taxonomy, within the cognitive domain, this level of response is at the bottom, or most basic level. For introductory level courses, this form of testing is a legitimate and appropriate choice. At times, students must simply memorize information such as terms, definitions, formulae etc. in order to develop a foundation of subject knowledge upon which they can build.

### What's the Right Question?

Multiple choice items should be clearly written and avoid the use of limiters such as 'always' or 'never', and the use of questions phrased in the negative ("Which of these is not ...). Where limiters or negatives are used, be sure to emphasize them with bold and/or underlined words. Make use of test banks provided by textbook publishers, if these have been developed by reputable educators.

If they have studied, students should be able to recognize the correct answer very quickly. No complex calculations or analysis should be necessary for this task of simple recognition of what has been memorized. Thus, it is suggested that approximately one minute per question be allotted for this type of test.

### What's the Right Answer?

When you receive the test analysis usually provided by machine scoring systems, look at the following before using the test again:

- Students' marks typically fall into a natural 'bell curve' with the average mark falling in the mid 60's, and fewer students achieving very high or very low marks.
- A high average may indicate the test was too easy (although occasionally, you just have a clever group of students! Don't judge on one use of the test).
- A very low average may indicate that the students had not mastered the test's content, or that the test was insufficiently tied to class material—do some serious thinking about the reasons for this outcome in the context of the class's other results.
- Look for and revise/eliminate questions that did not discriminate between students who knew the content and those that didn't—questions where a high % of students got the right answer, or a very low % of students got the right answer; especially look for 'distractor' answers (the incorrect choices) that a high % of students chose as correct—rephrase these to be less misleading.

### Higher Order Multiple-choice Testing

It is possible, however, to design multiple-choice test items to evaluate students' cognitive abilities at a higher level. The test items go beyond simple recognition into higher levels of application and analysis. Students must process more information, and engage cognitive processes that take more time. Thus, the time per question for this type of test should be considerably longer—perhaps five minutes per question.

Multiple-choice test items that evaluate these higher levels of reasoning should present the student with a case or situation, and then require him/ her to apply theories, processes, or other types of analysis learned in class to arrive at the answers to the multiple-choice items based on the case information.

For example, students in a Paramedic program might have an accident scene described in some detail. Five subsequent multiple-choice items might offer an identical set of potential answers, but the question for each set would present a variant of the following sequence: "Given the scenario described above, the FIRST action I would take would be ..." Each subsequent question would, obviously, replace the word "first" with "second," "third" etc. Thus, the students are required to assess the accident scene as described, looking for the details that will enable them to apply the knowledge learned in class regarding a wide variety of injuries, their treatment, the resources available in the ambulance, the distance to the nearest hospital, the consequences of delay etc. to their choice of the correct sequence of actions.

Similarly, a test item might present a description of the look, sound, customer description, and maintenance history of a car's engine performance, and require the student to choose a sequence of tests leading to a diagnosis of the problem, and then select an appropriate course of repair based on the test results.