

Writing Good Multiple Choice Questions, or *Good Questions Provide Good Data*

Note: I am not sure where I originally got this article, I think from a website many years ago, but the recommendations remain sound and succinct. There are many guides available online.

Purpose

Your goal in writing exam questions is to create a fair and accurate measure of students' learning and their progress towards the goals and objectives of your course. Your exam can also identify where the learning materials or activities in your course fall short of meeting student needs.

Well-written multiple-choice questions are recognized as a time-efficient question type, as they can be automatically graded and results and feedback can be provided to students quickly. Multiple-choice questions can also provide useful statistics to help evaluate students and the questions themselves.

Choosing the multiple-choice question type

- MCQs are best used when students can demonstrate they have reached the learning objective by recognizing a correct answer from a list of responses.
- Students who have mastered the concepts being tested can typically answer MCQs quickly. This allows faculty to increase the reliability of the assessment by providing more items. (The fewer the questions, the more likely it is that students can be successful through guessing alone.)
- Writing good MCQs can take some time, but gets easier with practice.

General principles

- Questions should align with course objectives and outcomes.
- Questions should be clear and easy to understand. (Our goal is to test student knowledge or analysis skills, not whether they can decipher a difficult question.)
- Avoid providing clues to the correct answer.
- Avoid "trick" questions.
- Each question should test a single concept.

Anatomy of a multiple-choice question

What is chiefly responsible for the increase in the average length of life in the United States from 1970 to 2020? (Stem)

- *A. The reduced death rate among infants and young children. (answer)
- B. Compulsory health and physical education courses in public schools. (distractor)
- C. The greatly reduced accidental deaths due to the safety movement. (distractor)
- D. Increased mechanization which reduces the need for manual labor. (distractor)

(Burton, 1991)

Writing the stem

- The stem contains the main idea and should be worded as a question.
- The question should avoid unnecessarily complex language.
 - Reduce bias by avoiding terms that may be unfamiliar to some students.
 - Use plural pronouns to avoid the gender-specific he/she.
 - Avoid using stereotypes.

Example of a question with unnecessarily complex language

Poor:

The promiscuous use of sprays, oils, and antiseptics in the nose during acute colds is a pernicious practice because it may have a deleterious effect on

1. The sinuses
2. Red blood cells
3. White blood cells

Better:

Which of the following is most likely to be caused by the frequent use of sprays, oils, and antiseptics in the nose?

1. Spreading the infection to the sinuses
2. Damage to the olfactory nerve
3. Destruction of white blood cells

Adapted from Handbook on Testing and Grading

- Negative questions are generally not recommended. Just because a student knows the wrong answer does not mean they know the correct one.
- If it is necessary to use a negative item, the word should be located in the stem and be bolded or italicized.
- Make certain that all of the answer choices are worded positively in order to avoid a double negative.

Example of a negatively worded question

- Poor Question:
 - Select which of the following actions should not be used when putting out a fire on the stove.
 - A. Do not move the pan.
 - *B. Pour water into the pan.
 - C. Put a lid on the pan.
 - D. Sprinkle baking soda or salt on the fire.
- Better Question:
 - Which of the following is the **best** choice for putting out a grease fire on the stove?
 - *A. Put a metal lid on the pan.
 - B. Pour cold water into the pan.
 - C. Sprinkle plenty of salt on the fire.
 - D. Lay several paper towels over the fire.

Adapted from Burton, 1991

The revised question is an example of a *best-answer* type. There are two correct answers, but one is clearly more correct than the other. In this case, smothering the fire by putting a large metal lid on it would be the best choice for putting out the fire, although sprinkling salt on the fire will help as well.

[See Dr. Tim Brophy's item stem templates](#) from Connecting the Dots by Ronald S. Carriveau

Writing answer choices

- One answer that is clearly correct or the “most” correct of the choices.
- Distracters are plausible for students who have not achieved the objective being measured by the question.
 - Ideally, all incorrect choices are equally plausible.
 - Distractors should be clearly implausible for students who have achieved the objective.

Example of implausible distractors

Poor:

Frank Lloyd Wright was among the architects searching for a new Midwestern architectural style. What was the name given to the architectural trend that developed?

- *The Prairie School
- Queen Anne Style
- Baroque
- High Victorian Gothic

Better:

Frank Lloyd Wright was among the architects searching for a new Midwestern architectural style. What was the name given to the architectural trend that developed?

- *The Prairie School
- The Craftsman Movement
- California Bungalow
- Minimal Traditional Style

- Avoid none-of-the-above or all-of-the-above.
- Avoid providing an “I don’t know option.”
- Phrase the choices positively as much as possible.
- If asking for the “best” choice, be certain that there is one clear best answer.
- Don’t use a funny distractor—students will know that is not the correct answer.
- If you are using numerical choices, do not provide answers with overlapping value ranges.

Example of numerical choices with overlapping values

Poor: The term “Generation Z” refers to people who were born during which of the following spans of years?

- 1993 - 2005
- *1997 - 2012
- 1985 - 2000
- 1989 - 2015

Better: The term “Generation Z” refers to people who were born during which of the following spans of years?

- 2013 - 2022
- *1997 - 2012
- 1981 - 1996
- 1965 - 1980

Clues

Avoid giving students clues as to the correct answer.

- Answer choices should be parallel and homogeneous as much as possible.
- Avoid repeating a word from the stem in the answer choices.
- Make the choices the same or similar in length.

Example of clues

Poor:

Christian Dior is known for the extravagant clothing he created to revive the fashion industry after World War II restrictions. Which of the following phrases is used to characterize this new style of dress?

- *A. New Look
- B. Flower Women of France
- C. Shapely Era
- D. Naturelle/Princesse and Longue lines

Better:

Christian Dior is known for the extravagant clothing he created to revive the fashion industry after World War II restrictions. Which of the following phrases is used to characterize these full-skirted designs?

- *A. New Look
- B. Flower Women
- C. Shapely Era
- D. Natural Lines

- Using terms such as “frequently,” or “seldom” can be a clue to the correct answer.
- Terms such as “always” or “never” may be a clue that an answer is incorrect.
- The grammar for all options should agree with the stem.

General tips

- Provide instructions, images, graphs, or any other details above the question.
- Opinion-based questions do not work very well, because then any of the answer choices could be correct.

Sources

Brophy, T. S. (n.d.). *A practical guide to assessment*. University of Florida Office of Institutional Assessment. <https://assessment.aa.ufl.edu/faculty-resources/a-practical-guide-to-assessment/>

Burton, S. J., Sudweeks, R. R., Merrill, P. F., Wood, B. (1991). *How to prepare better multiple-choice test items: Guidelines for university faculty*. Brigham Young University Testing Services and the Department of Instructional Science. <https://testing.byu.edu/handbooks/betteritems.pdf>

DiSantis, D. J. (2020). A step-by-step approach for creating good multiple-choice questions. *Canadian Association of Radiologists Journal*, 71(2), 131–133. <https://doi.org/10.1177/0846537119888358>

Office of Instructional Resources (1991). *Handbook on testing and grading*. The University of Florida. <https://www.at.ufl.edu/media/atufledu/handbook.pdf>