



Multiple Choice Questions (MCQs)

What are Multiple Choice Questions (MCQs)?

Multiple choice questions (MCQs) are a form of assessment for which students are asked to select one or more of the choices from a list of answers.

Structure of MCQs

MCQ consists of a stem and a set of options. The *stem* is usually the first part of the assessment that presents the question as a problem to be solved; the question can be an incomplete statement which requires to be completed and can include a graph, a picture or any other relevant information. The options are the possible answers that the student can choose from, with the correct answer called the *key* and the incorrect answers called *distractors*.

Example:
An outcome based student learning approach consists of 3 main elements, namely

STEM ↙

KEY →

DISTRACTORS ↘

- a) Learning Outcomes, Learning Activities, Assessments
- b) Course contents, teaching methods, Exams
- c) Group work, Problem Based Learning, Assessments
- d) Educational Aims, New teaching concepts, Exams
- e) None of the above

Y	Declarative	CHARACTERISTICS
P	Functioning	
	Take Time to Set	
	Take Time to Answer	
	Take Time to Correct	
	Take Time to provide Feedback	
Y	Suitable for Large Class	
Y	Can substitute with Computers	
Y	Passive	
	Active	
	Process Oriented Method	
Y	Product Oriented Method	

P = Possibly Y =Yes

Advantages of MCQs

- Good MCQs are designed to be objective. They usually have one (or a few) definite answers that is given as choices for the students to select. Thus there will be no ambiguity in marking due to subjective factors in the questions. Objective MCQs are easy to mark (a set of answer sheets is all required from the assessor) and thus do not require experienced tutor to mark them.



- MCQs take less time to complete, with shorter assessment time required, more questions can be assessed. Feedback is fast.
- MCQs can be administered into on-line assessments, such as online assessments can be very effective, and can prompt correct answers directly after completion with clarification and reasoning on the answers.
- Factors irrelevant to the assessed material (such as handwriting and clarity of presentation) do not come into play in multiple choice assessments. ([Wikipedia accessed 13 Jun 08](#))
- MCQs have high reliability, validity and manageability.

Disadvantages of MCQs

- MCQs are typically used for assessing knowledge only, students may often customize MCQs with rote learning. If assessors wish to use MCQs to assess deeper learning, careful attention (and many practices) on appropriate questions are required to administer.
- MCQs are usually used as formative assessments during class. They have a reputation of being easy. Thus students tend to receive higher marks in comparison to other assessments such as essays, reports, and presentations etc., for which a “glass ceiling” of around the 80% mark are often incurred. Care must be taken to design MCQs which have the same level of difficulty as other assessments. MCQs are usually used as formative assessment during the class. Obviously, students are unlikely to complain if they receive high marks in a formative MCQ assessment, but for summative assessment, if a different assessment method is used (which is usually the case), then students should be given clear assessment procedures and expectations. It is advisable to give practices on other assessments if such assessments are used for summative assessment.
- Guessing – with MCQs there is a possibility of guessing the correct answer, there are numerous methods to penalize students from guessing, such as negative marking (not recommended as sometimes produce negative effects to students who know the answers), more options to answers, adopting mathematical strategies to normalise marks, given partial marks to an answer very near to the correct answer.
- MCQs cannot test oral or written skills, it can test only the theories.

How to design good MCQs?

1. When writing the stem, use clear and direct language. The stem should be able to clearly identify the question. Avoid complex wordings which may confuse and frustrate students with sound understanding.
2. Avoid using unnecessary and irrelevant material.
3. You are not trying to catch your student out, so try not to use negatives. If negatives are used, highlight, bold or italic it.
4. Put as much of the question in the stem as possible, rather than duplicating material in each of the options.
5. Use only plausible and attractive alternatives as distractors.
6. Avoid giving clues to the correct answer.
7. If possible, avoid the choices "All of the above" and "None of the above". If you do include them, make sure that they appear as correct answers some of the time.
8. Do bear in mind what you are trying to test. They should be aligned with the intended learning outcomes.
9. Careful design questions will discourage rote learning.



Marking Rubrics

MCQs do not require any specific grading standards or criteria as the answers are usually set and defined. Thus as long as the assessors have a set of answer sheets with the correct choices taken, MCQs can be easily assessed and graded. Negative marking can also administer (but not recommended).

The following **Grading scheme** is often used for MCQs: (From WebCT)

- **Equally weighted:** This option will allocate an equal value to each answer. For example if the question is worth 20 points with four question and answer pairs, the student with two correct answers will be awarded 10 points and the student with 3 correct answer will get 15 points.
- **All or nothing:** The student must get all the matches correct for this question or they will receive a score of zero.
- **Right minus wrong:** The number of incorrect matches are subtracted from the correct matches to give the student a score. For example, in a question worth 30 points with three question and answer pairs, a student with two correct answers and one incorrect answer will be awarded ten points (20-10).

Web References and Resources

MCQ Assessment

- Computer-assisted Assessment (CAA)
<https://www.advance-he.ac.uk/knowledge-hub/computer-assisted-assessment-caa>
- Multiple choice, Wikipedia
http://en.wikipedia.org/wiki/Multiple_choice
- Xu, X., Kauer, S., & Tupy, S. (2016). Multiple-choice questions: Tips for optimizing assessment in-seat and online. *Scholarship of Teaching and Learning in Psychology*, 2(2), 147–158. <https://doi.org/10.1037/stl0000062>

Negative Marking

- What is the right choice? Times Higher Education, 4 May 2001
<https://www.timeshighereducation.com/news/what-is-the-right-choice/159581.article>

Tips for Students answering MCQs

- Multiple Choice Test Taking Strategies, Des Moines University
<https://www.dmu.edu/wp-content/uploads/MULTIPLE-CHOICE-TEST-TAKING-STRATEGIES.pdf>
- How to Take Multiple Choice Tests, Minot State University
https://www.minotstateu.edu/online/pages/tour_and_skills/skills_05.shtml
- Multiple-Choice Tips, The College-Level Examination Program' (CLEP)
http://www.collegeboard.com/student/testing/clep/prep_hint_mc.html

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