

Testing & Grading

Designing Tests to Assess Higher Order Thinking Skills

Contrary to what many think, testing is a key to effective learning.

Repeated studies have found that students' absorption and retention of information depends on how frequently they are tested on the material, rather than on how much they study it.

But all tests are not alike. Some tests simply measure student recall. But better test questions can assess students' higher level thinking abilities including their reasoning, problem solving, critical thinking, analysis, and creative thinking skills.

As teachers we tend to focus on student knowledge and comprehension. We frequently test students'

- recall of information
- knowledge of dates, events, and places
- familiarity with major ideas, concepts, terms, and formulae

These questions are not bad, but using them all the time is. It makes sense to ask higher order level of questions, which require more "brain power" and more reasoned answers. Higher order thinking involves applying knowledge, analyzing and manipulating information, solving problems, and developing supportable generalizations.

APPLICATION

This refers to the use of facts, rules, and principles to solve problems.

ANALYSIS

This involves subdividing a whole into its component parts and identifying an underlying structure or logic.

Sample questions include:

- What are the parts or features of...?
- Classify...according to...
- How does...compare or contrast with...?
- What evidence can you cite to show...?

SYNTHESIS

Combining knowledge and approaches in order to achieve fresh insights

Sample questions include

- What would you predict or infer from...?
- How would you design an experiment to...?
- What might happen if you combined...?
- What solutions would you suggest for...?



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EVALUATION

Assessing the significance, value, or quality of something, such as a decision, a controversy, an opinion, a judgment
Sample questions include:

- Do you agree with...?
- What do you think about...?
- What is the most important...?
- Place the following in order of priority...
- How would you decide about...?
- What criteria would you use to assess...?

Designing Effective Tests and Assignments

Many tests are poorly designed. They simply ask students to parrot back material from course lectures and readings. In fact, effective tests can promote student learning. How can you do this?

1. By clearly stating your instructional objectives.
2. By spelling out your grading criteria
3. By designing tests and assignments that are appropriate to your learning objectives
4. By providing students with constructive feedback.

Designing Tests Appropriate to Your Learning Objectives

There are many different kinds of test questions: There are “objective” questions -- including Multiple Choice, Matching, True-False, Short-Answer, Identification, Fill-in-the-Blank, and Number questions -- and there are Essay questions.

Objective questions offer an especially efficient way to measure students’ knowledge, such as their recall of key terms, facts, principles. Well written questions may also allow an instructor to assess students’ ability to apply knowledge: to solve problems and apply concepts and formulas.

Not only are multiple choice, matching, and true-false questions easier to grade, they also allow an instructor to test a much wider range of content than do essay questions. Objective questions are especially useful in assessing students’ command of subject matter content. A disadvantage of such kinds of tests is that they encourage guessing.

In designing objective questions:

1. Make sure that the question does not simply test students’ vocabulary and reading comprehension.
2. Make sure the wording is straightforward. Avoid extraneous detail and the use of negatives.
3. Answer options should be about the same length and parallel in grammatical structure

How can you create objective questions that test critical thinking?

1. Ask students to identify the correct outcome of a given circumstance.
Example: If nominal gross national product (GNP) increases at a rate of 10% per year and the GNP deflator increases at 8% per year, then real GNP:
 - a. Remains constant.
 - b. Rises by 10%.
 - c. Falls by 8%.
 - d. Rises by 2%.
2. Create a case study.
Example: Alice, Barbara, and Charles own a small business: the Chock-Full-o-Goodness Cookie Company. Because Charles has many outside commitments and Barbara has a few, Alice tends to be most in touch with the daily operations of Chock-Full-o-Goodness. As a result, when financial decisions come

down to a vote at their monthly meeting, they have decided that Alice gets 8 votes, Barbara gets 7, and Charles gets 2—with 9 being required to make the decision.

According to minimum-resource coalition theory, who is most likely to be courted for their vote?

- a. Alice
- b. Barbara
- c. Charles
- d. No trend toward any specific person.

3. Ask students to respond to what is missing or needs to be changed within a given scenario.

Example: Use the following diagram to answer the following questions.

4. Present students with a problem and ask them to evaluate a proposed solution.

Essay questions require students to construct a response rather than merely select a response. Essay questions can be time consuming to score and difficult to grade fairly. But these questions allow an instructor to assess students' abilities to reason, create, analyze, synthesize, and evaluate. Effective essay questions often present students with a “real-world” problem to solve, rather than simply selecting a solution from a limited list of possibilities. Compared to other kinds of test questions, essay questions require more systematic and in-depth thinking.

Effective essay questions are particularly difficult to write. Students need to know exactly what is expected of them. The essay question should also encourage complex thinking and original responses.

1. An effective essay question should not only require students to recall facts, but to make judgments and to explain the reasoning behind the judgment.

2. Effective essay questions are built around a “directive verb” such as: compare and contrast, defend, describe, define, evaluate, explain, identify, interpret, predict, propose (a solution), or trace.

3. An essay question should provide students with clearly defined task or focus.

4. Include a limited number of essay questions in a test because of the time required for the students to respond to them and the time required for the instructor to grade the responses.

5. Tell the students the criteria for grading. Write a model answer and construct a grading rubric.

Essay questions can be valuable not only in humanities classes, but also in social science and science courses.

Examples:

1. Ask students to summarize and evaluate an argument:

What positive and negative lessons can African Americans draw from the case of Harold Washington?

2. Ask students to summarize and evaluate an article's methodology:

How is the concept of political culture operationalized in Putnam's *Making Democracy Work*? Are there any shortcomings to this method? Can this methodology account for all the available evidence?

3. Ask students to infer the significance or unique contribution that a text, object, or event has for our understanding of a particular event or the development of scholarly literature.

In what ways was Martin Luther King crucial to the successes of the Civil Rights Movement? What were the limitations of his contribution? What did the Movement accomplish independently of his contribution?

4. Ask students to compose an explanatory narrative, saying how some event, institution, idea, or attitude came to be and why, explaining causes or the main results, or the role that a certain element played in the story.

Describe the repeated failure of liberal nationalism in Iran during the 1950s and 60s. How did the movement originally gain momentum and what were its main objectives? What led to its demise?

5. Ask students to evaluate a hypothetical or counterfactual narrative:
Imagine that our society completely integrates African Americans and white Americans in all areas of life (politics, residential areas, schools, universities, workplaces, marriages). How would the census classification in such a society differ from current practice? Provide specific examples.
6. Ask students to undertake a comparative analysis:
Is John Stuart Mill's argument for the liberty principle (in *On Liberty*) consistent with his moral theory (in Utilitarianism)?
7. Ask student to take a position on a given issue or question.
Does nuclear proliferation represent a major threat to international security? Consider the arguments presented by Waltz and Sagan and defend your position.
8. Ask students to apply or test a theory, model, definition, method, or category to some data.
Why did balance of power politics fail to prevent WWI and WWII?
9. Ask students to contextualize an event, work, or debate, saying how its circumstances (artistic, cultural, biographical, or institutional) played a role in making it what it is, or how we understand it differently, knowing this context, than we otherwise might.
How did WWII and the Allied Occupation shape Japanese politics in the succeeding decades? Did the Occupation and its consequences represent change or continuity with prewar days? Did they increase or decrease contrasts to other similar political systems? How much of the wartime and occupation heritage remains?
10. Ask students to recommend a course of action:
Provide students with a standard CIA country report for a fictitious country in Africa, including data on geography, demography, economic indicators, industry and labor market, communications, and brief political history and current system, including comparative data with other countries in the real region. Students are asked to write a memo to the U.S. Secretary of State recommending a course of action for a set of policy issues; for instance, on amount and kind of foreign aid, likelihood of state collapse, projects to consolidate nationhood, and a series of simulated circumstances (like participation in international organizations, new form of constitution, workers from the country ask for help in democratizing reform, spread of HIV/AIDS epidemic).

Effective Grading

Many students complain that grading is arbitrary, inconsistent, and unfair. Meanwhile, many instructors grumble about grade inflation, the excessive amount of time devoted to grading, and the many complaints that grading prompts.

Grades play at least three roles: evaluating students' work, communicating how they might improve, and motivating them to do so. Students often do not fully appreciate these roles, and see grades as rewards or punishments for effort, or tickets to success or failure in life instead.

Here are some exercises to help students to develop a better appreciation of the grading process:

Peer Review: Assign a short paper or ask students to bring a draft of their next assigned paper. Split students into pairs or small groups and have them read and evaluate each other's papers together. Structure their time by giving them a checklist of tasks to work through as they review each other's work. For example, ask them to begin by working out a set of criteria to be used in evaluation. This exercise can be effective in getting students to think more deeply about the assessment process.

Discuss Sample Papers: Identify sample assignments in each grade range, copy them and remove names, and discuss your comments and grades with students in section. Explain why you chose to comment as you did, what criteria you used, and ask the students for suggestions about how the work might be improved.

Grading is not simply a matter of bestowing isolated number or letter grades. It is a process that involves:

- Designing assignments and exams that promote the course
- Establishing standards and criteria
- Deciding which comments would be the most useful in guiding each student's learning objectives
- Assessing student learning and teaching effectiveness

If you are designing assignments, ask yourself:

- What do you want the students to learn?
- What are the goals and objectives of the course?
- How does the assignment contribute to those goals and objectives?
- What skills do you want students to employ: to solve, to argue, to create, to analyze, to explain, to demonstrate, to apply?

How can you determine if an assignment is effective? Ask yourself:

- How well focused is the assignment? Are the instructions clear and concise? Does the assignment give the students a clearly defined, unambiguous task?
- Do you want students to engage in research that goes beyond the course content or do you want them to stick to the course materials? What should the assignment format be? When will the assignment be due and how long will you need to grade it? When will the assignment be returned to students?
- Will you allow students to rewrite the assignment if necessary?
- Can this assignment be realistically completed given the knowledge, ability, and time constraints of the students? Is it clearly related to the course content? Are the research materials needed to complete the assignment available in sufficient quantity?
- Is it possible for you to grade this assignment effectively, given your workload and other commitments?
- How is this assignment going to contribute to the student's final course grade?

Grading criteria

Having clear criteria not only saves you time when grading, but it also helps to make the grading process more consistent, enables you to explain very clearly to students both what you expect from them and what they can expect from you, and helps students to understand why you have given them a certain grade and how their work might be improved. It also enables you to clearly diagnose students' strengths and weaknesses, and thereby to focus on improving the appropriate areas more effectively. You should also think about your policies on correct grammar and usage, late papers, and revision.

Sample Grading Policy Statement

Students sometimes appreciate it if you might spell out your grading policy.

Anonymity: As far as possible, grade papers and exams anonymously and ask students to write their name only on a cover sheet.

Regrades: Consider having a “cooling down” period before you regrade an exam or paper to give students time to consider your comments. Tell students that they need to explain why they think that the grade needs to be changed. Also, inform students that the entire paper or exam will be reassessed from scratch..

Typos and Mechanics: Inform students that papers will be graded down for excessive typos, misspellings, and mistakes in mechanics.

Extensions and Make-Ups: Have a clear policy regarding extensions and make-ups. For example, you might require students to ask in advance for an extension and to document all excuses. You might also institute a policy of docking a student's grade depending on how late the paper is.

Rubrics

Rubrics clearly spell out the criteria used for grading. Rubrics can help you give constructive feedback to students. Rubric contribute to fairness and consistency in grading. They also reduce student anxieties about subjectivity and unfairness in grading and reduce grade challenges.

Clarity, Strength, and Development of the Essay's Argument

- Is the argument clearly and compellingly stated?
- Is the analysis original and sophisticated?
- Is the argument well substantiated?
- Is the argument well developed?

Use and Interpretation of Evidence

- How accurate and thorough is the student's research?
- Is the evidence sufficient to support the essay's argument and is it accurately interpreted?

Application of Course Lectures and Readings

- Does the essay demonstrate a solid command of the course's themes and readings?
- Does the essay accurately define and use key course concepts?
- Does the essay situate its argument within a broader disciplinary context?

Quality of the Writing

- Clarity of expression
- Persuasiveness of the argumentation
- Whether the essay's structure is clear and logical

Organization and Mechanics

- Clear organization: introduction, transition sentences to connect major ideas, and conclusion
- Proper grammar and punctuation, accurate word choice, and correct spelling
- Use and integration of quotations
- Proper citation of scholarly ideas

Sample Rubric

Grade	Characteristics
A	<ul style="list-style-type: none"> ▪ The essay contains a clearly-stated, defensible argument. ▪ Sufficient data is used to defend the argument, and the data is accurately interpreted. ▪ The essay reflects solid understanding of the major themes of the course, using course readings to accurately define key concepts, and places the argument within a broader context. ▪ The essay is clearly organized (with an introduction, transition sentences to connect major ideas, and conclusion) and has few or no grammar or spelling errors. ▪ Scholarly ideas are cited properly.

B	<ul style="list-style-type: none"> ▪ The essay contains a defensible argument, but it is not be stated as clearly and persuasively as in an "A" paper. ▪ The argument is defended using sufficient data and course readings, but the use of this evidence does not always demonstrate a clear understanding of how the argument is situated within a broader context and its larger significance. ▪ The essay is clearly organized, but might benefit from more careful attention to transitional sentences. There are few grammar or spelling errors. ▪ Scholarly ideas are cited accurately.
C	<ul style="list-style-type: none"> ▪ The essay contains an argument, but the argument is not significant, does not sufficiently take into account counter-arguments, or is not well substantiated by the evidence. ▪ Data and course readings are used to defend the argument, but in a perfunctory way, without demonstrating the complexities of the topic. ▪ The essay may have either significant organizational or proofreading errors. ▪ Scholarly ideas are cited accurately.
D	<ul style="list-style-type: none"> ▪ The essay does not have a well developed argument substantiated by sufficient evidence and examples. ▪ Alternatively, or in addition, the paper suffers from significant organizational and proofreading errors. ▪ Scholarly ideas are cited, but not properly or thoroughly.
F	<ul style="list-style-type: none"> ▪ The essay does not provide an argument substantiated by sufficient evidence. ▪ The essay suffers from significant organizational and proofreading errors. ▪ Scholarly ideas are not properly cited.

Efficient Grading

Identify common problems students had with an assignment and prepare a handout addressing those problems. This helps you to avoid having to write the same comments multiple times. It also enables you to address the problem in more detail and helps students realize that others share the same problems.

Comments

Make sure you have adequately explained the reason for the grade.

Avoid one word comments such as "good" or "unclear." Explain your thinking in concrete terms.

Write specific comments in the margin and more general comments at the end of the assignment.

Give students a good sense of how they might improve their work.

Don't comment only on weaknesses or omission. Also identify strengths.

Keep a record of common problems and interesting ideas, and discuss them in class.

Questions to Ask Yourself When Writing Comments

- What were the strengths in this piece of work? What were the weaknesses? What stands out as memorable or interesting?
- Does the work have a clear thesis or main point, either explicit or implicit? Is it clear what point the author is trying to make and why? Are the main points and ideas clear? Are they specific enough? Are they clearly related to the assignment?
- Does the essay provide sufficient evidence or argumentative support?
- Is the writing clear, concise, coherent, and easy and interesting to read? Are the grammar and syntax acceptable? Is the writing style appropriate? Does the author understand all of the words and phrases that he or she is using?
- Does the work have a clear, logical structure? Are the transitions clear? Is there one main point per paragraph?
- Are the factual claims correct?
- Does the paper provide appropriate citations and bibliographical references?