

Spring 2015

## Week Six: Effective Tests - A Tool for Learning

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Welcome, Bienvenue, 形容



**Teaching Academy**  
**Part Six:**  
**Effective Tests:**  
**A Tool for Learning**

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Today's Big Idea

I was probably more scared of my high school exams than I was of the Oscars. At the time you think it's everything and if you don't do well, your life's over.

~Hugh Jackman


THE struggle . . .



getting stuff from here

to here

**Result: Exam stress can distort results.**

 **Teach and test so all students can show their true understanding of course content.**

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Readiness Assessment Test

**Step 1**


- **Assign Reading or Problems**

**Step 2**

- **Students Take Individual Test**  
Exposure to content during individual test helps reinforce students' memory of what they studied.

**Step 3**

- **Students Take Team Test**  
During team tests students discuss reasons for their answer choices & are exposed to peer input that aids in either strengthening or modifying their schemata of key concepts.



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RATs (cont.)


**Step 3**

- **Students Take Team Test**

IMMEDIATE FEEDBACK ASSESSMENT TECHNIQUE (IF AT)  
Name Team #3 Test # 1  
Subject \_\_\_\_\_ Total 23  
SCRATCH OFF COVERING TO EXPOSE ANSWER

	A	B	C	D	Score
1.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4
2.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
5.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
6.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
7.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0
8.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4
9.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Attempts	Number	Points
1	4	4
2	2	2
3	1	1
4	0	0



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RATs (cont.)

Step 4

▪ Appeals

Students given opportunity to restore credit for questions missed by making a successful written appeal. Highly engaged in a focused re-study of course concepts.

Step 5

▪ Instructor Feedback

Instructor provides feedback & clarification to resolve misunderstandings.

RAT Procedure


1. Assign reading

2. Individual test

3. Team test

4. Appeals

5. Instructor feedback



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Multiple Choice Primer

Stem

If you were teaching a Geography course, which assessment technique would you use to assess students' ability to create a scale model map?

Answer

A. Concept Map

B. Essay

C. Performance

D. True-False

Distractors

Stem:

A question or statement followed by a number of a choices that answer the question or complete the statement.

Alternatives:

All the possible choices to answer or complete the stem.

Answer:

The correct answer.

Distractors:

Incorrect choices.

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Multiple Choice Types

Single Correct Answer

All but one alternative is incorrect

Best Answer

Alternatives differ in degree of correctness — some completely incorrect & some correct, but one is clearly *more* correct than the others.

Negative Items

Student identifies incorrect alternative or one that is the worst

▪ Not recommended for general use—mastery is more effectively measured when students identify correct response

▪ Negative items appropriate for health & safety where knowing what NOT to do is important

Guide for writing negative items

▪ Place negative word in stem & emphasize with *italics*, **bold**, underline or CAPITALS

▪ Word alternatives positively

Brigham Young University. (1991). *How to Prepare Better Multiple-Choice Test Items*, p. 10

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Multiple Choice Types (cont.)

Multiple Response

Two or more alternatives are correct & remaining alternatives are distractors

Scoring multiple response items

▪ All-or-none—1 point if all correct alternative & no distractors selected, zero otherwise

▪ Independently score alternatives—one point for each correct alternative & for each distractor NOT chosen. Yields scores more representative of student's mastery, but most scoring machines cannot score these items

Combined Response or Complex M.C.

One+ alternatives is correct, other alternatives are distractors—students select combination of alternatives

Problems with combined response

▪ Disadvantages of all-or-none scoring & multiple response items

▪ Gives clues to students with partial knowledge

Brigham Young University. (1991). *How to Prepare Better Multiple-Choice Test Items*, p. 12

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Multiple Choice Types (cont.)

Research Finding

- Working memory—where info is consciously processed—is limited & easily overload
- Tests require significant conscious attention
- Remove item elements that distract or unnecessarily increase cognitive load

Sweller, J. (1994). Cognitive load theory, learning difficulty and instructional design. *Learning and Instruction*, 4, 295-312.

Food for Thought

- What kinds of multiple-choice questions do you ask?
- Do they come mostly from your textbooks test-item bank or do you write them yourself?
- In either case, have you critiqued them to ensure that they are well written?

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Content & Cognitive Levels

Table of Specifications

Chemistry Unit on Oxygen

Bloom

Content Covered

Knowledge

Comprehension

Application

Total %

Physical Properties	8	6	6	20%
Chemical Properties	12	9	9	30%
Preparation	4	3	3	10%
Uses	16	12	12	40%
Total %	40%	30%	30%	100%

- Helps avoid having too many knowledge items
- Coordinating test content & classroom coverage ensures *content validity*—tests what was covered

Indiana University, *How to Write Better Tests: A Handbook for Improving Test Construction*, p. 2

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Flex: Item Writing Tips

Multiple-Choice Question Tips

- Avoid trivial items or ones which call for fact memorization only
- State the stem in positive form
- Include as much of the item in stem but don't include irrelevant details
- Do not become needlessly wordy
- Word alternatives clearly & concisely
- Avoid alternatives “all of the above” and “none of the above”
- Use plausible distractors

Attending to technical problems helps you better assess ALL students' mastery.

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Flex: Test Writing Tips

- Begin writing items well in advance to allow time for revisions
- Do NOT assume items from textbook item bank are well constructed
- If items have been used before, analyze them for effectiveness
- Use a table of specifications to match items to outcomes AND to Bloom's levels
- Make each item independent—answer should not be embedded in another stem
- Avoid using examples & exact wording from textbook
- Ask colleagues for feedback

Based on ideas from Zimmarno, D.M. (2004). *Writing Good Multiple-Choice Exams*

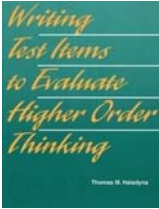
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Want to Know More?



**For basics on test items for higher order thinking, try:**

Haladyna, T.M. (1997). *Writing Test Items to Evaluate Higher Order Thinking*. Boston, MA: Allyn & Bacon.

**For tips on how to write essay questions, T-F, matching or completion items, read:**

*How to Write Better Tests: A Handbook for Improving Test Construction Skills*—pdf  
[http://www.indiana.edu/~best/pdf\\_docs/better\\_tests.pdf](http://www.indiana.edu/~best/pdf_docs/better_tests.pdf)

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Getting Students to Prepare

**The Problem**

- Students' reading compliance has declined from +80% to -20% in the past 30 years<sup>1</sup>
- National Survey of Student Engagement [NSSE] data indicates that +80% of seniors attend class without reading or preparation

**The Solution—Reading Guides**

- Look at the SLOs—create quiz questions, in-class activities, assignments
- *What information will students need to know in order to do well on the quiz? Is there additional information student need in order to participate in discussions, or for class activities ? For assignments?*
- Create matching questions—group items together where appropriate, i.e., vocabulary
- Have students take quiz online BEFORE class or at beginning of class—encourage use of Reading Guides for quiz taking

<sup>1</sup>Burchfield, C. M., & Sappington, J. (2000). Compliance with required reading assignments. *Teaching of Psychology*, 27, 58-60.

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For Next Time

**DUE:** Lesson plan that addresses a misconception or learning bottleneck in your target course—BRING a highlighter for use on a rubric

**Read:** Chapter 5, “Practice & Feedback”

**Extension:**

- [Dimensions of Learning, Summative Assessments, and Formative Assessments](#) (9:49)
- [Ten Tips for Writing True/False Questions](#) (4:43)
- [Ten Guidelines for Writing & Grading Essay Tests](#) (4:40)
- [Getting More “Teaching” out of “Testing and “Grading”](#) (FYI. Select first, then download)



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Notes & Reflection

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