

Fundamentals of Course Design II

Assessment and Exam Design

February 20, 2017



Formative Assessment

- **Thumbs up/Thumbs down**
- **Clickers**
- **Question/Discussion** - Ask students questions as you lecture, so a “lecture” becomes more “discussion.”
 - Prepare engaging questions prior to class to ensure promoting critical thinking
 - Make sure to eventually engage every student (and encourage students to question one another!)
 - Allow students time to think and respond to your questions
 - Remember to USE student responses to inform your teaching
- **Misconception/Preconception Check** - This technique assesses students’ prior knowledge, but with a twist. Its focus is on uncovering prior knowledge or beliefs that may hinder or block further learning.
- **Minute Paper** - Use at the end of class (for a lecture) or the beginning of class (as a “warm-up” or for homework). Instructor hands out note cards and asks: “*What was the most important/interesting/challenging thing you learned during the class?*” And “*What important question do you have about the lesson?*” Students’ brief responses provide feedback so instructors understand how well students are learning and can adjust instruction accordingly. <http://www.youtube.com/watch?v=GPR6hEsg-uo&feature=related>
- **Muddiest Point** - Can be used with a homework assignment, a reading, lecture, lab, etc. Ask students “*What was the muddiest point?*” Use the results to address gaps in learning. <http://www.youtube.com/watch?v=SvT6RmuZigw>
- **Analytic Memo** - Specify a problem or situation in your field of study. Have students write a brief analysis of the problem. Identify for whom the memo is being written. You may want to demonstrate with your own analytic memo.
- **One Sentence Summary** - Students are given an important topic or concept and asked to identify who, does what, to what/whom, when, where, how, why in one sentence.
- **Approximate Analogies** - Choose a key relationship or concept from your content and present it as an “A is to B as X is to Y” format. Further, you could ask students to give a brief rationale for their analogy. Students can work in groups, etc. You may need to provide several examples to get students started.
- **Application Cards** - After teaching about an important theory, principle, or procedure, ask students to write down at least one real-world application for what they have just learned to determine how well they can transfer their learning. Quickly read once through the applications and categorize them according to their quality. Pick out a broad range of examples and present them to the class.
- **Student-generated test questions** - Allow students to write test questions and model answers for specified topics, in a format consistent with course exams. This will give students the opportunity to evaluate the course topics, reflect on what they understand, and determine which are good test items. Make a rough tally of the questions your students propose and the topics that they cover. Evaluate the questions and use the best ones as prompts for discussion. Could revise the questions and use them on the upcoming exam.

Summative Assessment

Exam Checklist

Are students prepared for the exam?

Make old exams available to students, if possible. Make clear before any test what material you consider important. Make sure students have practice with the kinds of questions/problems on the exam.

Does the exam reflect your goals for the course?

Compare material in the test to the major topics listed in your syllabus, lecture outlines, and the textbook, to make sure you've been consistent.

Is the exam of reasonable length?

Take the exam yourself. You should generally be able to finish in one-fourth the time it will take the students. Keep time-consuming number-crunching to a minimum.

Are the directions and the format clear and well-organized?

Ask a colleague or TA to read over the instructions to help you spot any ambiguities or misleading statements. Make sure the print is clear and that if there is space left for problems/ essays, it is of suitable length.

Is it clear how much credit each question is worth?

Make sure that the value of each question is clear, so students can decide how much time to spend on each part of the exam.

Is it free of double jeopardy?

Do students need an answer from one part of the exam in order to understand or solve another?

Does it begin with questions or problems that will build, rather than undermine, student confidence?

Have compassion for students' test anxiety and start an exam with questions that are reasonably easy for a prepared student.

Are the questions/problems interesting?

Try to include interesting applications or combinations of material that show the value of the material students are being tested on. Make sure to challenge, but not to confuse, your students.

Designing Test Questions

SOURCE: <http://teaching.uncc.edu/learning-resources/articles-books/best-practice/assessment-grading/designing-test-questions#sthash.PNeI9dXD.dpuf>

True/False

Good for:

- Knowledge-level content
- Evaluating student understanding of popular misconceptions
- Concepts with two logical responses

Advantages:

- Can test large amounts of content
- Students can answer 3-4 questions per minute

Disadvantages:

- They are easy
- Difficult to discriminate between students who know the material and students who don't
- Students have a 50-50 chance of getting the right answer by guessing
- Need a large number of items for high reliability

Tips for Writing Good True/False Items:

- Avoid double negatives
- Avoid long/complex sentences
- Use specific determinants with caution: never, only, all, none, always, could, might, can, may, sometimes, generally, some, few
- Use only one central idea in each item
- Don't emphasize the trivial
- Use exact quantitative language
- Don't lift items straight from the book
- Make more false than true (60/40) – students more likely to guess “true”

Matching

Good for:

- Knowledge-level content
- Some comprehension-level, if appropriately designed

Types:

- terms with definitions
- phrases with other phrases
- causes with effects
- parts with larger units
- problems with solutions

Advantages:

- Maximum coverage at knowledge-level in minimum amount of space/prep time
- Valuable in content areas that have a lot of facts

Disadvantages:

- Time consuming for students
- Not good for higher levels of learning

Tips for Writing Good Matching Items:

- Use 15 items or less
- Give good directions on basis for matching
- Use items in response column more than once (reduces the effects of guessing)
- Use homogenous material in each exercise
- Make all responses plausible
- Put all items on a single page
- Put response in some logical order (chronological, alphabetical, etc.)
- Responses should be short

Short Answer

Good for:

- Application-, synthesis-, analysis-, and evaluation-levels

Advantages:

- easy to construct
- good for "who," what," where," and "when" content
- minimizes guessing
- Encourages more intensive study: student must know the answer vs. recognizing the answer

Disadvantages:

- May overemphasize memorization of facts
- Take care - questions may have more than one correct answer
- Scoring is laborious

Tips for Writing Good Short Answer Items:

- When using with definitions: supply term, not the definition, for a better judge of student knowledge
- For numbers, indicate the degree of precision/units expected
- Use direct questions, not an incomplete statement
- If you do use incomplete statements, don't use more than 2 blanks within an item
- Arrange blanks to make scoring easy
- Try to phrase question so there is only one answer possible

Multiple Choice

Good for:

- Application-, synthesis-, analysis-, and evaluation-levels

Types:

- Question/right answer
- Incomplete statement
- Best answer

Advantages:

- Very effective
- Versatile at all levels
- Minimum of writing for student
- Guessing reduced
- Can cover broad range of content

Disadvantages:

- Difficult to construct good test items
- Difficult to come up with plausible distracters/alternative responses

Tips for Writing Good Multiple Choice Items:

- Stem should present single, clearly formulated problem
- Stem should be in simple, understood language; delete extraneous words
- Avoid "all of the above"-- can answer based on partial knowledge (if one is incorrect or two are correct, but unsure of the third...)
- Avoid "none of the above"
- Make all distracters plausible/homogenous
- Don't overlap response alternatives (decreases discrimination between students who know the material and those who don't)
- Don't use double negatives
- Present alternatives in logical or numerical order
- Place correct answer at random
- Make each item independent of others on test
- Way to judge a good stem: students who know the content should be able to answer before reading the alternatives
- List alternatives on separate lines, indent, separate by blank line, and use letters vs. numbers for alternative answers
- Need more than 3 alternatives, 4 is best

Essay

Good for:

- Application-, synthesis-, and evaluation-levels

Types:

- Extended response: synthesis and evaluation levels; a lot of freedom in answers
- Restricted response: more consistent scoring, outlines parameters of responses

Advantages:

- Students less likely to guess
- Easy to construct
- Stimulates more study
- Allows students to demonstrate ability to organize knowledge, express opinions, show originality

Disadvantages:

- Can limit amount of material tested, therefore has decreased validity
- Subjective, potentially unreliable scoring
- Time-consuming to score

Tips for Writing Good Essay Items:

- Provide reasonable time limits for thinking and writing
- Avoid letting them to answer a choice of questions (you may not get a good idea of the broadness of student achievement when they only answer a set of questions)
- Give definitive task to student: compare, analyze, evaluate, etc.
- Use checklist point system to score with a model answer: write outline, determine how many points to assign to each part
- Score one question at a time, all at the same time.

Oral Exams

Good for:

- Knowledge-, synthesis-, and evaluation-levels

Advantages:

- Useful as an instructional tool: allows students to learn at the same time as testing
- Allows teacher to give clues to facilitate learning
- Useful to test speech and foreign language competencies

Disadvantages:

- Time consuming to give and take
- Could have poor student performance because they haven't had much practice with it
- Provides no written record without checklists

Student Portfolios

Good for:

- Knowledge-, application-, synthesis-, and evaluation-levels

Advantages:

- Can assess compatible skills: writing, documentation, critical thinking, problem solving
- Can allow student to present totality of learning
- Students become active participants in the evaluation process

Disadvantages:

- Can be difficult and time consuming to grade

Performance

Good for:

- application of knowledge, skills, abilities

Advantages:

- measures some skills and abilities not possible to measure in other ways

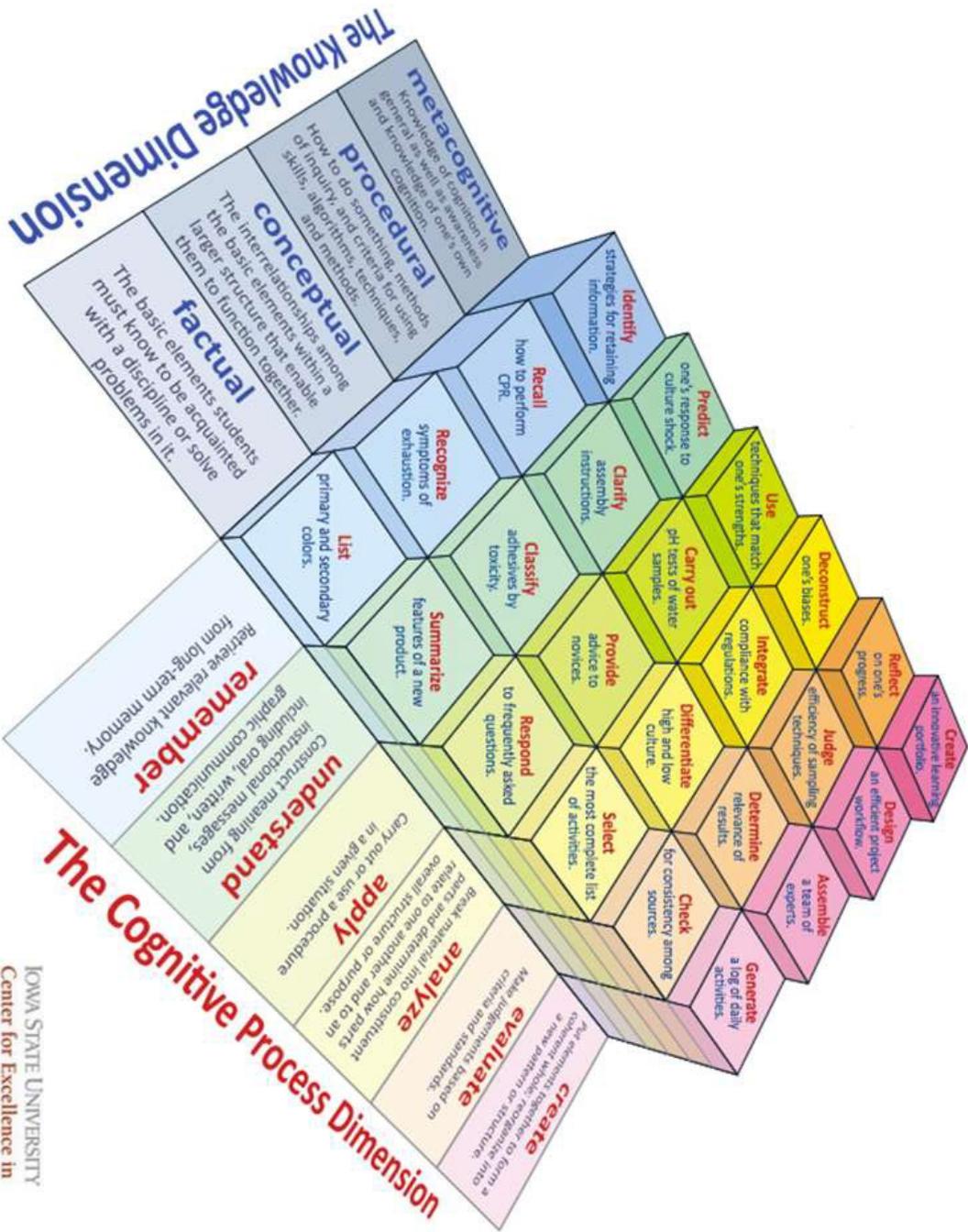
Disadvantages:

- May be difficult to use in some fields of study
- Difficult to construct
- Difficult to grade
- Time-consuming to give and take

Thought-Provoking Question Stems

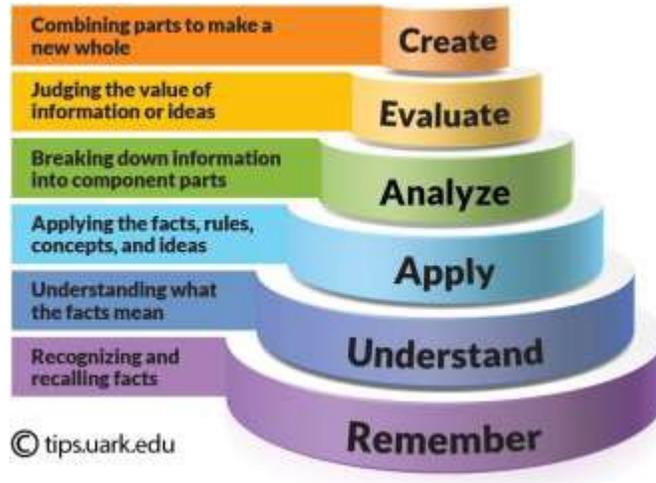
Source: Alison King, p. 24 in Changing College Classrooms. ©1994 Jossey-Bass.

1. What is a new example of ___?
2. How could ___ be used to ___?
3. What would happen if ___?
4. What are the implications of ___?
5. What are the strengths and weaknesses of ___?
6. What is ___ analogous to?
7. What do we already know about ___?
8. How does ___ affect ___?
9. How does ___ tie in with what we learned before?
10. Explain why ___.
11. Explain how ___.
12. What is the meaning of ___?
13. Why is ___ important?
14. What is the difference between ___ and ___?
15. How are ___ and ___ similar?
16. How does ___ apply to everyday life?
17. What is the counterargument for ___?
18. What is the best ___, and why?
19. What are some possible solutions to the problem of ___?
20. Compare ___ and ___ with regard to ___.
21. What do you think causes ___? Why?
22. Do you agree or disagree with this statement: ___? What evidence is there to support your answer?
23. How do you think ___ would see the issue of ___?



Bloom's Taxonomy

Bloom's Taxonomy is a useful classification of educational objectives and can help you evaluate what types of questions you are asking students and what level they are working at.



Below are examples of questions using Bloom's taxonomy for the topic of voting behavior.

LEVEL	VERBS USED	EXAMPLE
Remembering: can the student recall or remember the information?	define, duplicate, list, memorize, recall, repeat, reproduce, state	<i>What percentage of Americans voted in 2012?</i>
Understanding: can the student explain ideas or concepts?	classify, describe, discuss, explain, identify, locate, recognize, report, select, translate, paraphrase	<i>Describe two costs and two benefits of voting.</i>
Applying: can the student use the information in a new way?	choose, demonstrate, dramatize, employ, illustrate, interpret, operate, schedule, sketch, solve, use, write	<i>Propose one way the United States could reduce the costs of voting.</i>
Analyzing: can the student distinguish between the different parts?	compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test	<i>Compare the Michigan and Rochester models of voting behavior.</i>
Evaluating: can the student justify a stand or decision?	appraise, argue, defend, judge, select, support, value, evaluate	<i>Defend the merits of the Michigan model of voting behavior.</i>
Creating: can the student create a new product or point of view?	assemble, construct, create, design, develop, formulate, write	<i>Design a replacement for the electoral college system.</i>

30 ALTERNATIVE ASSESSMENTS

1. Scaffolded Writing Assignment
2. Poster Presentation
3. PowerPoint or Prezi Presentation
4. Collaborative Testing
5. Group Project
6. Class Portfolio
7. ePortfolio
8. Video Assignment
9. Audio Recording
10. Concept Map
11. Clicker Quizzes
12. Policy Memo
13. Reflection Journal
14. Interviews or Focus Groups
15. Survey Data Collection
16. Student-led Discussion/Lecture
17. Editorial Writing
18. Letter to Local Representatives
19. Class Blog
20. Editing an Academic Wiki
21. Community-Based Projects
22. Simulations/Role-Play Scenarios
23. Brochure Design
24. Museum Attendance and Reports
25. In-class Debate
26. Creating Application Problems
27. Educational Games
28. Model Construction
29. Storyboard Creation
30. Internship/Job Research and Application

Learn more about these and other alternative assessments at:

The Kaneb Center website (additional resources on the Course Design Series site)

The Kaneb Center's Learning Technology Lab Remix-T project (learning.nd.edu/remix)

NOTES

NOTES