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Designing Student Assessment Tools: Tests, Problems, and Essays,

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Introduction

As long as teachers have been teaching and students have been learning, it has been the task of the teacher to evaluate, grade, or assess the performance of the student. Tests are created for many reasons: they can provide formative feedback to students – letting them know how they are doing; they can provide summative feedback – grading used to certify and sort students. Teachers certify that students have performed at a certain level and others use that certification to make decisions: should the student receive a degree or not, should the student be accepted into graduate school or not, should the student be hired or not. In this article, we will look at how to construct good assessment tools: multiple choice, true-false, matching and short answer tests; problems; and essays.

Why UseAssessment Tools?

There are three general reasons to assess students:

1. To let students know how they are doing – In this type of testing the student learns how well he or she is doing in relation to expected learning outcomes. Scores may or may not be used by the instructor in any formal way. Used in this way, assessment tools can help reduce student test anxiety and can provide private formative feedback to students on how well they are doing and what they need to improve.

2. To find out if students have mastered a learning objective – This type of testing helps the instructor plan future instruction and determine whether to move forward to the next level of material. Used in this way, assessment tools can also help the instructor evaluate their own teaching methods. Test 'scores' in this type of testing are normally not used in grading or making comparisons. Angelo and Cross (1993) describe many different tools or Classroom Assessment Techniques for assessing whether students have reached a specific objective. Details on Classroom Assessment Techniques (CATs) are provided in a separate article.

3. To grade, classify, compare, and certify students – In this type of testing, the instructor can rank or classify students on their basis of their knowledge in a subject area; compare classes, groups, or schools in a subject area; assign year end grades; award certificates, scholarships; and so on. Final exams or provincial tests would fall into this category.

Principles of Good Test Construction

Tests are composed of various types of questions. These questions can be classified into two categories: those in which there is one correct answer for each question and scoring

is an objective process; and those in which students can express an opinion which is then scored subjectively. Three types of objective questions– multiple choice, true-false, and matching – and one type of subjective questions – short essay questions – are described.

Objectively scored test questions will take you a lot longer to write than to correct. In order to prepare good tests items, the instructor must have:

- a thorough knowledge of the subject matter,
- be working with a clear set of instructional objectives, and
- be able to write clearly.

If you are not sure that you have all of these characteristics, you should not attempt to write your own test questions -- find someone to help you.

Building a "bank" or set of good objective test items may take several years. Some instructors build a bank of test items by having students write appropriate test items as part of a presentation assignment. If students are asked to prepare a presentation on a segment of the course content, they may develop the depth of knowledge required to write appropriate test items. The instructor, of course, should check that student-generated test items conform to the guidelines for writing good questions.

Subjectively scored test questions call for the student to write in the best word or phrase to complete a sentence, or to write two or three sentences that answer a question or solve a problem.

Guidelines for preparing each type of question are provided below. Following each set of guidelines, you can test your understanding of them. The answers to these "tests" are provided at the end of each section.

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Multiple Choice Questions

Multiple Choice Questions (MCQ) consist of a 'stem' in which a problem or question or situation is outlined followed by several alternative answers or solutions. The 'alternatives' include the 'correct' or 'best' answer and several 'distractors' – plausible but incorrect responses.

Guidelines for Developing MCQs:[1]

1. The stem presents a single, definite, meaningful statement to be completed or answered by one of the alternatives.

2. All the alternatives must be grammatically consistent with the stem of the item. Without grammatical consistency, the answer may be inadvertently signaled. If, after writing the alternatives, you find that each begins with the same word, include that word in the stem.

3. Keep students' reading efforts to a minimum by eliminating irrelevant material in both the stem and the alternatives. Such material tends to give away the correct answer.

4. Avoid negative statements. If negatives must be used, CAPITALIZE, underline, or highlight the negative term.

5. Use only plausible and attractive alternatives as incorrect response choices. Implausible alternatives will help give away the correct answer.

6. Use as choices "all of the above" or "none of the above," sparingly, if at all.

7. Ensure that only one response is considered correct by experts in the field.

8. Avoid irrelevant sources of difficulty.

9. Arrange response choices in a logical order but make sure that the correct responses for a set of questions do not form any predictable pattern.

10. Questions should relate to specific learning objectives.

11. Provide between three and five alternatives

12. Number the questions and provide letters for the alternatives.

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[1] Guidelines and exercises are adapted from: Gronlund, N.E. & Linn, R. (1990) *Measurement and evaluation (6th edition).* New York: Macmillan Publishing; and McBeath, R.J. (Ed.) (1992) *Instructing and evaluating in higher education*. Englewood Cliffs, NJ: Education Technology Publications; and *Alabama Professional Development Modules* (2002), Alabama Department of Education, accessible from http://web.utk.edu/~mccay/apdm/

13. Do not include a phrase such as "what do you think …" because then any answers would have to be considered correct.

14. Provide clear instructions for how students are to indicate the correct response – by circling the correct letter or by entering the correct letter in a clearly identified space. Circling the correct response is a better alterative for persons with poor handwriting skills. Leave space between the alternatives to allow room for the student's response.

Exercise on writing multiple choice questions

Directions: Read each of the multiple choice test items. If the item violates one or more of the guidelines which are written above, write down the number of the guideline/s violated. The * indicates the correct response (according to the instructor). Then make notes on how to correct any problems. Appropriate corrections are provided at the end of the test.

1. An example of an extinct animal is an:

a sloth.
b Eskimo curlew. *
c pocket gopher.
d wombat.

2. John F. Kennedy was assassinated

a in the year 1961.
b in the year 1968.
c in the year 1963.*
d in the year 1965.

3. Thumb sucking is likely to produce the greatest psychological trauma from:

a birth to two years.
b 3-5 years.
c 6-12 years. *
d 13-20 years.
e 21 years or older

4. The ingredient used as a leavening agent is

a baking powder.
b baking soda.
c yeast.*
d arrowroot.

5. In the Maritimes

a timbering is the primary industry.

b the annual yearly rainfall is 30 inches.

c annual income is higher than the US average.

d Halifax is the most populous city. *

6. The vessel which carries oxygenated blood from the heart to the body is called the

a trapezius muscle.

b forebrain.

c patella tendon.

d ascending aorta. *

7. South Africa leads the world in the mining of

a bauxite.

b diamonds. *

c iron ore.

d all of the above.

8. In all ecosystems, maintenance will not be possible without a continual external source of:

a living adult organisms.

b plant spores.

c oxygen.

d energy.*

9. Kurt Vonnegut, Jr. wrote which of the following books?

a Jailbird.

b Player Piano.

c Timequake.

d Cat's Cradle

e All of the above *

10. An electric transformer can be used

a for storing up electricity.

b to increase the voltage of alternating current.*

c it converts electrical energy into mechanical energy.

d alternating current is changed to direct current.

11. Who discovered the North Pole?

a Christopher Columbus.

b Ferdinand Magellan.

c Robert Peary.*

d Santa Claus.

12. South America

a is a flat arid country.

b imports coffee from the United States.

c has a larger population than the United States.

d was settled mainly by colonists from Spain.*

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Answers to the Multiple Choice Questions

1. Violates guideline #5. The article "an" suggests the correct answers. To correct the problem, either remove the article from the stem and place an appropriate article in front of each alternative, or use "a/an" at the end of the stem instead of "an".

2. Violates guidelines #3 and 9. Move the phrase "in the year" into the stem. Place the years in chronological order.

3. OK

4. Violates guideline #7. All the alternatives are leavening agents To make a correct question, the specific product to be created would need to be specified in the stem (e.g., The leavening agent used in bread is …) or three alternatives that are not leavening agents would need to be provided (e.g., salt, flour, water).

5. Violates guideline #1. The stem does not present a meaningful statement or enough information. Rewrite the stem

6. Violates guideline #5. Only answer "d" is a "vessel." Replace the alternatives with structures that are vessels in the body .

7. Violates guideline #6. Answer "d" could be replaced by a fourth material that is mined.

8. Violates guideline #4. The negative statement needs to be highlighted or eliminated.

9. OK. This question could be rewritten using only one of Vonnegut's books and eliminating answer "e"

10. Violates guideline #2. All the alternatives must use the same grammatical structure. In this case, the most appropriate change would be to change all the alternatives into clauses beginning with "to." Then the word "to" would be moved to the end of the stem.

11. Violates guideline #5. Alternative "d" is not plausible

12. Violates guidelines #1. The stem is meaningless. South America is not a "country."

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True-False Questions

The most common form of a true-false question is to use a declarative statement which students must judge to be true or false Provide either a blank space where students write in T or F or provide a column of T's and F's and ask students to circle the correct response. Having students write in the T or F can sometimes result in errors based on poor handwriting.

To ascertain whether students understand the answer or to eliminate guessing, ask students to change false items to true by changing key words in the statement, such as asking them to write the converse statement. If you chose this option, you must provide a blank space where students can write in the words they want to change.

Guidelines for Developing True-False Questions:

1. **Clarity – Use statements upon which clear judgments can be made:**
    a. Avoid ambiguous/indefinite terms.

    b. Avoid broad general statements.

    c. Avoid including two items in one statement unless cause-effect relationships are being measured.

    d. Avoid long or complex sentences.

    e. Avoid negative statements, especially two negatives in one sentence.

    f. Avoid using unattributed opinion, unless discrimination between fact and opinion is specifically being measured.

2. **Cues – Avoid unintentional cues:**
    a. Avoid the use of specific determiners: for example: "all," "none," "never," "always," "generally".

    b. Avoid answer patterns. Responses should be randomly sequenced and approximately evenly proportioned.

    c. Avoid length cues, all statements should be of similar length.

3. **Relevance – Relate to objectives:**
    a. Relate items to specific learning objectives.

    b. Avoid trivial content and detail.

Exercise on writing True-False Items

Directions: Read each of the true-false test items. If the item violates one or more of the guidelines provided above, write down the number(s) of the guideline(s) violated and make notes on how to improve the item.

The correct answers are provided at the end of the test along with suggestions for improving the test item.

		True	False
1	Otto Rank was Sigmund Freud's personal secretary.	____	____
2	The separate but equal doctrine was not rejected by the Supreme Court in the Plessy vs. Fergusen decision.	____	____
3	Canadians can be assured of an adequate living through a government guaranteed annual income plan.	____	____
4	The speed of sound is proportional to loudness	____	____
5	Mt. Lassen, which is the last active volcano in the contiguous states, is located in the Cascade Range in Washington.	____	____
6	All plants photosynthesize.	____	____
7	The United Nations censured South Africa for its racial intolerance.	____	____

8. Indicate whether each of the following statements is True or False. Write in the converse of each statement

	True	False	Converse for False Items
All dogs are mammals	____	____	
All marsupials are kangaroos	____	____	
All parasites are animals	____	____	
No snakes are reptiles	____	____	

		True	False
9	None of the information in the instruction manual was unnecessary.	____	____
10	The Prime Minister of Canada is elected.	____	____
11	An objective test is easier to score than an essay test.	____	____
12	Shakespeare wrote in several different modes.	____	____

Answers to the True- False Questions

1. Violates guidelines #3b. Write a more substantial question about Freud.
2. Violates guideline #1e. Restate in the positive form
3. Violates guideline #1f. This statement is someone's opinion
4. OK
5. Violates guideline #1c. Make the parts of the statement into two items.
6. Violates guideline #2a. Avoid using specific determiners (e.g., "all").
7. OK
8. OK. In this case, the use of specific determiners is off-set by the requirement that students write the converse for the false items.
9. Violates guideline #1e. Rewrite without the double negative
10. Violates guideline #1b. Rewrite as a less broad statement
11. Violates guideline #2a. Avoid using specific determiners (e.g., "easier").
12. Violates guideline #1a. The phrase "several different modes" is too ambiguous. The questions can be improved by specifying the number of different modes of writing (e.g., Shakespeare wrote in four different modes).

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Matching Questions

The matching test is constructed much like a multiple choice test. Two columns are presented. The left column (I) lists a series of 'premises'; the right column (II) lists alternative responses.

Guidelines for Developing Matching Questions:

1. Specify the basis for matching premise and response.

2. Select homogenous premises and response choices. Don't mix premises.

3. Keep the length of matching entries in Column II shorter that the length of the premises in Column I.

4. Keep the number of items brief.

5. Present a series of elements of similar test items in logical order.

6. Put the items with more words into Column I to facilitate reading.

7. Use numbers to identify premises in Column I; letters to identify responses in Column II. Capital letters are less likely to result in errors caused by poor handwriting.

8. Arrange responses in Column II in either a logical or natural order or alphabetically if there is no apparent organizational basis.

9. Do not list premises in the same order as the responses, avoid using any pattern in the correct responses.

10. There should be no keywords appearing in both premise and response to provide a clue to the correct answer.

11. Both premises and responses should be part of a common set. It should not be possible to subdivide the premises and responses into two or more discrete sets.

12. All the premises and responses for a matching item should appear on the same page.

13. Provide more responses than there are premises **OR** Indicate whether a response can be used more than once.

14. Indicate where to write answers.

Exercise on writing matching questions

Directions: Read each of the matching test items. If the item violates one or more of the guidelines, write down the number of the rule/s violated. Then make notes on how to correct any problems. The correct answers and suggestions for improving the test items appear at the end of the test.

1. Directions: On the line to the left of each space accomplishment listed in Column I, write the letter of the date in Column II when the accomplishment took place. Each date in Column II may be used more than once.

Answer	Column I	Column II
_____	1. First space vehicle to reach Venus	A. 1969
_____	2. First communications satellite placed in orbit	B. 1962
_____	3. First landing of men on the moon	C. 1961
_____	4. First American in space	D. 1960
		E. 1965

2. Directions. The following is a list of incomplete statements. Select the word or words from the list on the right that best describes or completes the phrase.

	Column I		Column II
	1. The belt of calm air near the equator is called the ...		A. Doldrums
	2. Climate characterized by clear skies, dry air, and little rainfall latitude is found in the area of ...		B. Horse
	3. The wind belt immediately north or south of the doldrums is called ...		C. Prevailing easterlies
	4. Most of the United States lies in the belt of winds known as ...		D. Prevailing westerlies

3. Directions. Listed in Column II are parts of the eye. Match these parts with the description listed in Column I. Parts can be used only once. Write your answers on the attached answer sheet.

	Column I	Column II
_____	1. Area containing cones	A. Fovea

_____	2. Central region of the eye	B. Iris
_____	3. Elastic connective tissue	C. Retina
_____	3. Light receptor tissue	D. Sclera
		E. Vitreous Humor

4. Directions: On the line next to each accomplishment in Column I, print the letter of the person in Column II who is associated with that accomplishment. Each name in Column II can be used only once.

Answers	Column I	Column II
_____	1. Discovered electricity	Alexander Graham Bell
_____	2. Famous for composing waltz music	Benjamin Franklin
_____	3. Composed marches, such as the Stars & Stripes Forever	George Gershwin
_____	4. Invented the telephone	Louis Pasteur
_____	5. Wrote musical scores for Broadway shows	John Phillip Sousa
		Johann Strauss

Answers to the Matching Questions

1. Violates guideline #8. Rearrange responses in Column B in numeric order.

2. Violates guidelines #1, 13, 14. Rewrite the directions specifying basis for making the match; provide more responses than premises or indicate that a response may be used more than once; and indicate where to provide the answers.

3. Violates guideline #12. Reformat test so that the instructions, premises and responses all appear on the same page.

4. Violates guideline #11. Two premises involve inventors, three involve musicians. Three responses are inventors; three are musicians. Revise so that

all premises and responses are from a single set – either inventors or musicians.

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Short-Answer and Completion Questions

Short answer and completion items are essentially the same, differing only in the method of presenting the problem.

- The short-answer uses a direct question and asks the student to write one, two or three sentences as an answer.
- A completion item consists of a statement with a missing word or words and a space where the student is to insert the correct word or phrase.

Examples:

Short Answer Question -

What is the name of the person who invented the toilet?

_____

Completion Question:

The name of the person who invented the toilet is _____.

Guidelines for developing short answer questions:

1. Word the item so that the required answer is both brief and specific and so that only one answer can be correct.

   Poor: An animal that eats the flesh of other animals is classified as _____. (Both carnivore and omnivore would be correct)

   Better: An animal that eats only the flesh of other animals is classified as _____.

2. Do not take statements directly from textbooks to use as a basis for short-answer items. When taken out of context they may be too general and ambiguous.

   Poor: Chlorine is a _____. (Too general and ambiguous)

   Better: Chlorine belongs to a group of elements that combine with metals to form salts. Therefore, it is called a _____.

3. A direct question is usually more desirable than an incomplete statement.

   Poor: John Glenn made his first orbital flight around the earth in _____. (The correct answer could be a date, a time, or a vehicle).

   Better: In what year did John Glenn make his first orbital flight around the earth? _____

4. If the answer is to be expressed in numerical units, indicate the type of units the answer requires.

   Poor: If oranges weigh 5 2/3 oz. each, how much will a dozen oranges weigh? _____. (Answer could be expressed in ounces only or in a combination of pounds and ounces).

   Better: If oranges weigh 5 2/3 oz. each, how many pounds and ounces will a dozen oranges weigh? _____

5. Blanks for Short Answer Questions answers should be equal in length and in a column to the right of the question.

6. Embedded blanks for Completion Questions should be near the end of the sentence rather than at the beginning so that the student has an opportunity to formulate a framework before encountering the missing word or phrase.

   Poor: _____ that are born alive and suckle their young are called _____

   Better: Warm-blooded animals whose young are born alive and are _____ by their mother are called _____. (Note that there are several different phrases that could be used for the first blank (e.g., suckled, nursed, breast-fed).

7. If you are trying to determine whether a student knows a process, use an example that focuses on the process rather than on computational skills.

   Poor: What is the average of the following numbers: 15 ⅔, 27½, and 41? (This answer calls for computation skills that may are unnecessarily difficult).

   Better: What is the average of the following numbers: 63, 89 and 40?

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Principles of Good Problem Construction

Problems should be keyed to the course learning objectives. In selecting which problems to include on a test or examination, Rangachari (n.d.) recommends that the instructor ask him or herself the question "Would I be embarrassed if a student who has completed my course does not even know this (content)?" The answer permits the instructor to select problems from among the many hundreds that could be asked on any test or examination.

Rangachari goes on to list some additional useful questions to ask in setting problems.

- How long should the problem be?
    - Try to avoid lengthy problems. More short problems is better than a fes lengthy problems.
    - Try answering the problem yourself – if you can answer it in two minutes, then allow at least 10 minutes for a student to answer it.
- How can I ensure that students do not miss key concepts?
    - To ensure that key concepts are covered, begin by writing down key words and phrases that must be included in either the problem or the data to be provided.
- How can I make this problem interesting, challenging?
    - Once the basics have been written, you can dress up the problem by changing the context or the roles involved.
    - Try to tie problems to real-life situations if possible.
- How much data do I need to provide?
    - Decide whether students need to know formulae or vocabulary from memory or whether you are going to provide the essentials.
    - Decide whether to provide extraneous data or just the bare essentials.
    - Decide what instruments/tools the students need to use to solve the problem. What type or instruments/tools? Who provides them?
- How open-ended should the problem be?
    - Decide whether the problem can have more than one answer.
    - Decide whether more than one strategy may be used to solve the problem.
- How many marks should I assign
    - Decide whether you will assign partial marks for each component of the problem, for the procedures used, and for the final answer?
    - Develop a scoring key for assessing each problem.

Once you have written the problem and have a draft copy prepared for student use, check its effectiveness by having someone else (e.g., a colleague or teaching assistant) answer it to ensure there are no typographical or grammatical errors in the text, instructions or data that might cause confusion. Correct the draft copy rather than typing a new copy to avoid introducing more typographical or grammatical errors.

Finally, provide students with some guidance about the marks to be assigned to each problem and the approximate amount of time that should be spent on solving each one.

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Principles of Good Essay Question Construction

Essay questions afford students the opportunity to express themselves in their own words, to think about the topic, decide what to write, and do the writing. Such questions can be used to:

- Measure the student's ability to organize and apply knowledge.
- Reveal the student's approach to problem solving.
- Assess higher order thinking skills such as analyzing, synthesizing, and making judgments.

Essay questions should be used to measure outcomes that cannot be measured by other types of questions. Two or more short, specific essay questions are preferable to a single, longer essay question.

Guidelines for Developing Essay Questions:

To ensure objectivity in scoring essay questions use the following techniques:

1. Conceal student names when scoring.

2. Construct tests that contain several shorter questions rather than one long question.

3. Avoid optional questions

4. Score all the papers, one question at a time.

5. Shuffle the papers or score them in reverse order on subsequent questions.

6. Structure the question so there is little room for subjective interpretation

7. Construct and use a scoring key or rubric.

8. Decide in advance if spelling and grammatical errors will result in lost marks

9. If possible, have a second person score essay questions independently. This is particularly important for inexperienced instructors.

To construct clear essay questions

Define the task as specifically as possible without giving away the answer.. The student should be able to tell how the item will be scored (i.e., what you are looking for in the answer) and how much weight will be given to each essay answer to determine the total test score.

1. Use key words to specify the thinking processes expected (Refer to the article on writing educational objectives).

2. State requirements clearly.

3. Indicate expected response length.

4. Set time limits or page limits.

5. Give a scoring weight for each question.

To score essay questions fairly, try to follow these guidelines:

- Have students place their name on a cover page only and their student number as a running head on the written pages. Remove the cover page before you start scoring the essay.

- Read all the responses to one essay question in all student papers. Then do the same thing with the next essay question. When reading the next question reverse or shuffle the order in which you read the papers.

- Give each student's response a rating using your scoring key. Re-read borderline papers to verify the score.

- An alternative approach is to read the work of each student and place it into one of three piles -- (1) excellent/very good/above average, (2) adequate/good/average (C), and (3) poor/below average. Then re-read all the essays in one pile to verify your opinion; repeat with the other two piles. Then review the papers in each pile and order them again to assign a final mark.

- Another approach is to read each student's essay answer quickly and give it a tentative score; then re-read it more carefully and give it a score in accordance with the scoring key you have developed.

Exercise on writing essay questions
Directions: Examine each of the following essay questions. Determine if each violates any of the guidelines listed for constructing essay questions. Make some notes on how to improve the question.

1. Write a one-page statement defending the importance of wearing socks without holes. Answers will be evaluated in terms of organization and relevance of points raised.

2. Compare the Liberal and Conservation parties.

3. List the causes of World War I.

4. Write several paragraphs about after-school employment for students during the school year.

5. Discuss the conditions that existed in Germany just prior to the start of World War I and those that existed just prior to the start of World War II.

Answers to the Essay Questions

1. OK

2. Requirements are not clear enough; and no limits in terms of time or length are suggested. Variations in answers may be quite wide.

3. An inappropriate use of essay testing. Lists are more appropriate in an objective test.

4. The thinking processes required are not specified. Better versions might be:
    a. Compare the scholastic performance of students who work after school during the school year with those who do not.

    b. Discuss both the positive and negative effects on school performance of students who work after school during the school year.

5. An appropriate use of essay testing. However, the term "discuss" is ambiguous. It could mean anything from "tell me everything you know about this topic" to "analyze in depth." Better words might be "Describe the economic conditions that existed in Germany prior to World War I and World War II."

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Scoring keys

A scoring key must be developed by the instructor prior to administering any essay questions or essay assignments. You need to know what you are looking for before you start scoring any papers. Two types of scoring keys are described here.

Point-Score Method

The instructor writes a model answer for an essay question and devises a scoring key of the essential elements in the answer. This key then guides the evaluation. It is important that the instructor:

- Identify essential response elements
    - organization of the essay (e.g., introduction, body of the essay, conclusion)
    - content – specify information, facts or concepts to be included.
    - examples or applications
    - reflective comments.
    - spelling and grammar

- Assign points to each element in relation to its overall importance.
    - If the organization of the essay is more important than spelling and grammar, then how are points to be assigned to reflect this importance.
    - In considering content, identify the essential points that must be included and the number of points to be assigned to each item.

- Determine whether marks will be assigned for accurate content provided but not included in the identified essential elements. If the total number of marks assigned to content is 10 and the student includes all the essential points but also includes accurate content that was not identified as essential, should additional marks be given?

- Determine the maximum number of points that can be deducted for spelling and grammar errors.

Assessment Rubric or Rating Method

This method is used when it is not practical to draft a model answer because the responses are so complex or extensive that isolating a host of key elements is cumbersome. Therefore, each answer is judged for quality by a previously determined set of rating criteria. (e.g. completeness, clarity, accuracy, integration). An assessor can be the course instructor, a peer or someone who is deemed capable of assessing a student's performance.

When student assignments must be assessed on the basis of subjective or qualitative standards, the instructor can make such assessments more equitable and useful by developing either a checklist or an assessment rubric. When assessing a student's

performance on an assignment, a checklist calls for the assessor to simple check off whether or not the student used the listed behaviour; an assessment rubric calls for the assessor to rate the quality of the listed behaviour. Examples of different rubrics are provided at the end of this article.

- A checklist is a list of behaviours or activities that an assessor expects to see in a student performance. No numerical value is assigned to these behaviours or activities but the assessor may establish a minimum number that should be checked off to give a student a passing grade.

- A holistic rubric calls for the instructor to rate the overall performance of the student, often on a rating scale of 1–5, with 1 usually the lowest score and 5 the highest. The instructor can then change the score to a letter grade or numeric mark and include it as a percentage of the student's total grade or mark. A holistic rubric does not call for the assessor to separate out specific behaviours but does call for a subjective overall assignment of a grade

- An analytic rubric calls for an assessor to rate performance on selected behaviours that contribute to the overall performance. Each behaviour is rated, often on a scale of 1–3 or 1–5. The ratings are then summed and used to create a grade or mark. Sometimes the separate behaviours are rank ordered i.e., rated against each other) and the most important behaviours are assigned a multiplying factor in accordance with their relative importance.

Checklists and assessment rubrics are often combined with written subjective comments from the assessor that should help the student improve his or her performance on subsequent assignments. Such comments should be provided particularly when a student has done poorly on one or more criteria.

As with all evaluation strategies, checklists and assessment rubrics need to be developed before the course begins in order to be fair to all students and to accurately measure the quality of the student's performance in the course.

To develop an assessment rubric, the following tasks need to be carried out:

1. For each learning objective, identify specific observable attributes that you want to see in a student's assignment or performance (e,.g., in written assignments, students will use correct spelling and grammar; in oral presentations, students will speak clearly and audibly).You may also need to identify features of an attribute that you do not want to see (e.g., in written assignments, more than 10 spelling or grammar errors will lead to a deduction of marks).

2. For each attribute, generate a list of specific features that describe or define it. (e.g., spelling must follow either Canadian or American rules).

3. For each attribute, define what constitutes above average, average and below average performance.
   e.g., Above average – no spelling or grammatical errors
   Average – fewer than 10 spelling or grammatical errors
   Below average – 10 or more spelling or grammatical errors.

4. For each attribute, write a clear narrative description for each level of performance.
   i. Begin by writing the descriptions for the highest and lowest levels;
   ii. Then write descriptions for the intervening levels

5. Decide whether attributes are equivalent in value. If they are not, determine a multiplying factor to be assigned to each attribute.

6. Test the rubric by using it to score student work. Decide if the final mark assigned according to the scoring key is appropriate.

7. Revise the rubric

8. Collect samples of student work relevant to each attribute and level of performance for future reference.

Samples of Assessment Rubrics for courses in Adult Education are provided on the following pages:

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Example of a Holistic Assessment Rubric

In the following assessment rubric was written for a graduate course in Adult Education. While it provides a list of observable attributes and a narrative account of the performance expected at each level, it offers the student only an overall assessment without offering specific details on how to improve future assignments. It also leaves the matter of assigning plus or minus grades (e.g., A+ or A-) to the discretion of the instructor, without indicating to the student how such grades would be calculated.

Evaluation Criteria for Written Essays in Adult Education

The following evaluation criteria will be applied when assessing written papers. The numerical equivalents and grade point equivalents of letter grades are provided in brackets. Please note that, for graduate students, a grade below C (2.0) or a grade point average (gpa) below 3.0 is unacceptable.

Grade of A

(gpa: A+=4.3; A=4.0; A-=3.7); (numeric equivalents: A+=90+; A=85-89; A-=80-84)
Demonstrates originality of thought and ideas; well organized and well expressed; uses sound critical assessment of ideas; demonstrates ability to discriminate, analyze and synthesize relevant ideas; clear command of principles of adult learning and education; includes sound reflective and self-reflective learning; uses a consistent and accurate format for referencing the work of other authors; uses standard English grammar and spelling. Evidence of reading and integration of knowledge beyond the core readings.

Grade of B

(gpa: B+=3.3; B=3.0; B-=2.7); (numeric equivalents: B+=77-79; B=73-76; B-=70-72)
Demonstrates good basic understanding of the concepts involved; well organized and clearly expressed; shows good critical assessment of ideas; demonstrates ability to discriminate and analyze relevant ideas; good grasp of principles of adult learning and education; includes some reflective and self-reflective learning; uses a consistent format for referencing the work of other authors; uses standard English grammar and spelling. Evidence of reading and integration of all the core readings.

Grade of C

(gpa: C+=2.3; C=2.0); (numeric equivalents: C+=65-69; C=60-64)
Good grasp of concepts; organized logically and expressed clearly; some evidence of critical assessment of ideas; demonstrates ability to discriminate relevant issues; provides some evidence of principles of adult learning and education; provides references for the work of other authors; uses standard English grammar and spelling. Evidence of reading and integration of some core readings.

Grade of F

(gpa: F=0), (numeric equivalent: F=0-49)
Inaccurate reproduction of knowledge; inaccurate interpretation or inappropriate application of concepts; no evidence of critical thinking or assessment; no evidence of reflective learning; material poorly organized; not readable or understandable; provides no references for the work of other authors; uses poor English grammar and spelling.

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Example of an Analytic Assessment Rubric

The following assessment rubric was designed for essay assignments in an undergraduate course in Adult Education. The rubric is similar to the holistic rubric provided in the previous example but the observable attributes have been sorted into categories and a mark assigned for each of five performance levels for each attribute. The numeric value of these five levels follows the 4.0 to 0.0 grade point average rating system used by the university.

Note that the total value of marks that can be obtained on assignments using this rubric would be 28 and that no student could score higher than an average of 4.0. The assignment of any average above 4.0 (A+), therefore, would be left to the discretion of the instructor.

Adult Education Evaluation Criteria

The following evaluation criteria are used in Adult Education courses when assessing written student assignments. The numerical values assigned correspond to the following letter and percentage grades:

4	A	80% and over
3	B	70-79%
2	C	60-69%
1	D	50-59%
0	F	49% or less

Understanding and Use of Concepts

4 Excellent understanding, accurate, appropriate and creative use of concepts
3 Good understanding, accurate and appropriate use of most concepts
2 Basic understanding, accurate and appropriate use of some concepts
1 Basic understanding, inaccurate and inappropriate use of some concepts
0 Lack of understanding, inaccurate and inappropriate use of most concepts

Analysis and Synthesis

4 Extensive evidence of sound critical thinking, creative synthesis of ideas.
3 Some evidence of sound critical thinking, synthesis of ideas appropriate
2 Evidence of some critical thinking, synthesis of ideas inappropriate
1 Little evidence of critical thinking, synthesis of ideas lacking
0 No evidence of critical thinking or synthesis of ideas

Self-reflection

4 Extensive evidence of self-reflection
3 Some evidence of self-reflection throughout
2 Evidence of self-reflection in some sections
1 Little evidence of self-reflection
0 No evidence of self-reflection

Organization of Information

4 Clear and logical organization of information
3 Clear organization of information with some lapses in logic
2 Some organization of information, logic unclear
1 Poorly organized, logic unclear
0 No evidence of organization

Expression of Ideas

4 Excellent expression of ideas, accurate use of words, no or few errors in grammar or spelling
3 Good expression of ideas, most words used accurately, minor errors in grammar or spelling
2 Ideas are understandable; some misuse of words, frequent errors in grammar and spelling
1 Lacks clarity in expression, frequent misuse of words, frequent errors in grammar and spelling
0 Material is neither readable nor understandable

Referencing Work of Others

4 Full, accurate and appropriate reference to work of others
3 Some reference to work of others; references are accurate and complete
2 Some references missing, inaccurate or incomplete
1 Many references missing, inaccurate or incomplete
0 No evidence of references to work of others

Evidence of Reading beyond Course Assignments

4 Ample evidence of reading beyond course assignments
3 Some evidence of reading beyond course assignments
2 Readings limited to course assignments
1 Sparse evidence that course assignments were read
0 No evidence of that course assignments were read

Example of an Analytic Assessment Rubric with Multiplying Factors

The assessment rubric provided on the next page was designed to mark essay assignments in Adult Education. This rubric offers the same seven criteria as the previous example and the same narrative descriptions of performance levels but now includes multiplying factors for the criteria deemed by the instructor to be the most important.

Note that the total marks now add to 48; the instructor could choose to assign letter grades to the total marks. The decision about the equivalence between numeric marks and letter grades may be a departmental or faculty policy or may be up to the discretion of the instructor. For example:

46-48 = A+	32-33 = C+
43-45 = A	29-31 = C
40-42 = A-	27-28 = D+
38-39 = B+	24-26 = D
36-37 = B	
34-35 = B-	23 or less = F

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Assessment of Written Assignments in Adult Education

	4	3	2	1	0	Total
Understanding and use of concepts	Excellent understanding, of concepts; accurate, appropriate and creative use of concepts	Good understanding of concepts; accurate and appropriate use of most concepts	Basic understanding of concepts; accurate and appropriate use of some concepts	Basic understanding of concepts; inaccurate and inappropriate use of some concepts	Lack of understanding of concepts, inaccurate and inappropriate use of most concepts	____ x 3 = _____
Analysis and synthesis of ideas	Extensive evidence of sound critical thinking, creative synthesis of ideas	Some evidence of sound critical thinking; appropriate synthesis of ideas	Evidence of some critical thinking; inappropriate synthesis of ideas	Little evidence of critical thinking; synthesis of ideas lacking	No evidence of critical thinking or synthesis of ideas	____ x 2 = _____
Self-reflection	Extensive evidence of self-reflection throughout	Some evidence of self-reflection throughout	Evidence of self-reflection in some sections	Little evidence of self-reflection	No evidence of self-reflection	____ x 1 = _____
Organization of information	Clear and logical organization of information	Clear organization of information with some - lapses in logic	Some organization of information; logic unclear	Poorly organized; logic unclear	No evidence of organization	____ x 2 = _____
Expression of ideas	Excellent expression of ideas; accurate use of words; no errors in grammar or spelling	Good expression of ideas; most words used accurately; fewer than 10 errors in grammar or spelling	Ideas are understandable; some misuse or words; fewer than 25 errors in grammar or spelling	Lacks clarity in expression, frequent misuse of words; more than 25 errors in grammar and spelling	Material is neither readable nor understandable	____ x 1 = _____
Referencing work of others	Full, accurate and appropriate reference to work of others	Some reference to work of others; references are accurate and complete	Some references missing, inaccurate or incomplete	Many references missing, inaccurate or incomplete	No evidence of references to work of others	____ x 2 = _____
Evidence of reading beyond assigned readings	Ample evidence of reading beyond assigned readings	Some evidence of readings beyond assigned readings	Readings limited to assigned course readings	Sparse evidence that assigned course readings were read or used	No evidence that assigned course readings were read or used	____ x 1 = _____

Total mark _____/ 48

References

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Useful Websites

Alabama Professional Development Modules
http://web.utk.edu/~mccay/apdm/
This document addresses how to develop all types of test questions, provides exercises to test your skills, and offers generally helpful advice.

Michigan State University
http://www.msu.edu/~taprog/resources/

Schreyer Institute, Penn State University
http://www.schreyerinstitute.psu.edu/Resources/class_assessment.asp

Southern Illinois University, Edwardsville
http://siue.edu/~deder/assess/catmain.html