Designing effective test questions

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Understanding the problem...

Classroom tests serve two primary purposes. First, they should be used to assess the degree to which students have learned what they should have learned so that teachers can plan appropriate up-coming lessons. Second, they provide a vehicle for providing students feedback about how well they have learned the material. If the test is not well designed, then neither of these goals are served well because the test results do not reflect what students actually know.

Likewise, when students perform poorly on tests, we often assume that poor performance is due to lack of student ability or effort studying for the test. The tendency is to "blame the student" and then lower both our perceptions and expectations of the learner by dumbing-down the curriculum. Inevitably, students with disabilities who perform poorly on tests seek test modifications and/or accommodations in order to increase their chances of success.

While lack of ability and/or effort often plays a role in poor test performance, another critical factor is the quality of the test itself. Many students perform poorly on tests because the instructions and/or test questions have been poorly worded or designed. Rather the "blaming the student", sometimes the situation is more analogous to "blaming the victim" -- the student became a victim of the poorly written test (not only did the student receive a lower grade, s/he also is perceived as less capable or lazy).

A key to the solution...

When students are not performing well on tests, the first factor to consider is NOT the student's capabilities or efforts studying, but rather the quality of the test itself. Often minor improvements in assessment procedures can mean the difference between success and failure for many students. Aspects of a test that can be clarified for the benefit of all students include writing The goal is to provide clear, unambiguous directions and test questions that are free of convoluted, confusing language and unfamiliar vocabulary. In addition, there are specific tactics appropriate for specific kinds of test questions. These are discussed below.
Assessing tips....

Clear test directions
Test directions are a critical and often overlooked aspect of test construction. The rest of the test is unimportant if the student does not clearly understand the directions.

Suggestions for Writing Directions
1. Keep directions simple avoiding unnecessary words.
2. List only one direction in each sentence.
3. Underline the word Directions to focus the student’s attention.
4. Place directions at the beginning of each test section.

**Effective Example:**

Directions: Circle the best answer.

1. The capital of Alabama is __________.
   a. Birmingham
   b. Montgomery
   c. Dothan
   d. Mobile

**Clarification** The word “Directions” is present and underlined. The wording is simple and concise.

**Faulty Example:**

Write the accompanying letter of the most appropriate response that will complete the following sentences provided.

1. The capital of Alabama is __________.
   a. Birmingham
   b. Montgomery
   c. Dothan
   d. Mobile

**Clarification** The word “Directions” is not present. The wording is confusing and unnecessarily lengthy.)
Multiple-choice items
A talented item writer can construct multiple choice items that require not only recall of knowledge but also comprehension, interpretation, applications, analysis, or synthesis to arrive at the correct answer.

Suggestions for multiple choice

1. Keep as much of the item as possible in the stem (the question) and keep the answer and distracters as short as possible. This makes for less reading and less chance for confusion.

2. Include in the stem only the material needed to make the problem clear and specific. The test should assess the student’s knowledge of the material not the ability of a student to locate a question from a wordy passage.
3. **Avoid** frequent use of “all of the above”, “none of the above”, “either … or”. These questions often require less knowledge for test wise students than traditionally worded questions and are confusing to students with less ability.

4. Arrange the answer and distracters vertically on the page.

### Effective Example:

1. The organ that produces insulin and digestive enzymes is call the
   
   a. gall bladder
   b. liver
   c. pancreas
   d. stomach

**Clarification** The needed information is contained in the stem. Answers are arranged vertically.

### Faulty Example:

1. The pancreas
   
   a. is an endocrine gland that controls basic functions such as breathing and body temperature.
   b. produces bile that breaks down fat.
   c. produces digestive enzymes and insulin.
   d. contains hydrochloric acid that dissolves food and kills bacteria.

**Clarification** The answer and distracters require too much reading and contain information that should be in the stem. Answers should be arranged vertically.
Effective Example:

1. The system of maintaining a balance of power between the three branches of government is often referred to as_______.
   a. manifest destiny
   b. checks and balances
   c. Articles of Confederation
   d. veto power

Clarification: The stem only contains information relevant to the question.

Faulty Example:

1. The framers of the constitution wanted to keep any one of the branches of government from becoming too powerful so they developed a system of maintaining a balance of power between the legislative, executive and judicial branches of government. This system is often referred as_______.
   a. manifest destiny
   b. checks and balances
   c. Articles of Confederation
   d. veto power

Clarification: The stem is wordy and contains information not relevant to the question.

Effective Example:

1. Which of the following numbers is divisible by 5?
   a. 48,294
   b. 50,553
   c. 160,280
   d. 13,341

Clarification: This question does not contain an “all of the above” statement.

Faulty Example:

1. Which of the following numbers is divisible by 5?
   a. 48,294
   b. 50,553
   c. 160,280
   d. 13,341
   e. all of the above

Clarification: The “all of the above” statement only requires that the student recognize one incorrect answer making it a meaningless distracter that can only cause confusion.
True-false items

True-false questions are popular because they are easy to construct and easy to grade. Despite these advantages, the true-false test is not considered to be a sound method for assessing student performance because it is hard to write items that are neither too easy nor too difficult or items that are not so ambiguous or tricky that they provide a poor assessment of knowledge. True-false items are best suited for categorical knowledge that is unambiguously true or false.

Suggestions for True-False

1. To eliminate any confusion, avoid stating questions negatively. Watch for "double negatives."

2. Avoid using the words all inclusive terms such as “never”, and “always” in statements.

3. Avoid long wordy sentences.

Effective Example

<table>
<thead>
<tr>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tuberculosis is communicable disease.</td>
</tr>
</tbody>
</table>

Clarification
The statement is worded positively.

Faulty Example

<table>
<thead>
<tr>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tuberculosis is not a non-communicable disease.</td>
</tr>
</tbody>
</table>

Clarification
The statement is in the form of a double negative.

Effective Example

<table>
<thead>
<tr>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Pathogenic bacteria are parasites.</td>
</tr>
</tbody>
</table>

Clarification
The statement is brief and unambiguous.

Faulty Example

<table>
<thead>
<tr>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>All bacteria cause disease.</td>
</tr>
</tbody>
</table>

Clarification
The term “all” is an all-inclusive word. Test wise students know that the answer is false when such a term is used.
NOTE: Underlining a word or clause in the statement is a simple variation that reduces the ambiguity by focusing the attention of the student on the most important part of the statement.

**Example:**

<table>
<thead>
<tr>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Decaying algae in a lake reduces the lake’s supply of <strong>nitrogen</strong>.</td>
<td></td>
</tr>
</tbody>
</table>

### Matching items

Matching measures factual information in a compact and efficient manner based on simple association.

**Suggestions for Matching**

1. Use no more than 10 items in the matching list.
2. Place the list of more lengthy items in the left column. This makes for less reading.
3. Avoid having students draw lines to the correct answer. This may be visually confusing.
4. Keep all matching items brief.

### Effective Example

**Directions:** Match the terms to the definitions.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Internal angles total 180 degrees</td>
<td>a. acute</td>
</tr>
<tr>
<td>2. An angle less than 90 degrees</td>
<td>b. obtuse</td>
</tr>
<tr>
<td>3. A parallelogram with equal sides</td>
<td>c. rhombus</td>
</tr>
<tr>
<td>4. An angle larger than a right angle</td>
<td>d. trapezoid</td>
</tr>
<tr>
<td>5. A quadrilateral having one pair of parallel sides</td>
<td>e. triangle</td>
</tr>
</tbody>
</table>
Completion (fill-in-the-blank) items

Since this type of question requires recall memory, which is a difficult task for students with disabilities, it should be used sparingly if at all without a word bank.

Suggestions for Completion

1. In a completion item, omit only key words.
2. Put the blanks near the end of the statement instead of the beginning.
3. Write simple and clear test items.

Effective Example

1. An example of an endocrine gland is the __________ gland.

Faulty Example

1. The ____________ gland is an example of an endocrine gland.

Clarification

The blank is near the end of the test item.

Effective Example

1. Excess glucose in the blood is stored in the liver in the form of ___(glycogen)___.

Faulty Example

1. The liver __(stores)__ excess glucose as glycogen.

Clarification

The omitted word is a key word; also, the blank is near the end of the test item.
**Essay questions**

Essay questions require the student to recall the relevant factual information, organize the ideas, and write an extensive response. These questions can be difficult for students with poor comprehension, memory problems, poor organizational skills, or deficient writing skills.

*Suggestions for essay questions*

1. Be sure students know the meaning of such words as: discuss, contrast, compare, criticize, compare, define, describe, list etc. Underline these clue words.

2. Allow students to outline answers using a graphic organizer or provide an outline.

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**Effective Example:**

Compare and contrast life in Russia and the United States. Use this outline to help in writing your answer.

1. Similarities (COMPARE how they are alike)
   a. How is daily life the same in Russia and the U.S.?
   b. Give two examples.

2. Differences (CONTRAST how they are different)
   a. How is daily life the same in Russia and the U.S.?
   b. Give two examples.

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**Clarification**

The essay question provides a structure that will more likely produce a successful answer.

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**Faulty Example:**

Discuss life in both Russia and the United States by comparing and contrasting the governments, societies and economic systems of the two countries.

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**Clarification**

The question is too long, clue words are not underlined, an outline is not suggested or included.

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