Lecture Objectives

- Distinguish a learning objective from a teaching objective/goal
- Discuss the ways learning objectives can help the teacher
- Recognize and avoid pitfalls of poor objective-writing
Writing Learning Objectives

• Are we making this too complicated?

• Just something we need to deal with for compliance purposes?

“In order to comply with the policies of the Accreditation Council for Continuing Medical Education, the AUR and RSNA request the following information from you as a presenter...”
• Only problematic if it’s an afterthought to the lecture or session content
Learning Objectives versus Teaching Objectives

• Why does it seem difficult?

• We naturally focus on teaching objectives
  ➢ What we want to cover in the lecture
  ➢ An outline of topics
  ➢ Our goals
Learning Objectives versus Teaching Objectives

- But we need to consider the objectives from the learners point of view!
  - Active and outcome focused
  - What the learner will be able to do after the session
  - “Measurable actions”
Learning Activities
(reading, lecture, small group disc., rounds)

Objectives

Evaluation
(test, case report, presentation)
Writing Learning Objectives

• What to do:
  1. Decide what is critical for the students to take away from the session
  2. Consider the depth of understanding that is appropriate given the audience level
      • Simply memorize a list of information?
      • Demonstrate comprehension of material?
      • Apply knowledge to a novel scenario?
Writing Learning Objectives

3. Keep in mind the test question you want to ask when designing your objectives
   • If you write a very specific objective it limits the exam question, but directs learning
4. Refer to Blooms taxonomy to help guide the language of the learning objective

- Available online
- Describes learning domains
  - Cognitive (Knowledge)
  - Affective (Attitude)
  - Psychomotor (Skills)
Bloom’s Taxonomy: Cognitive Domain

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation
Writing Learning Objectives

• How can Bloom’s taxonomy help guide language?

Measurable action words!
<table>
<thead>
<tr>
<th>Skill</th>
<th>Sample prompts</th>
<th>Purpose</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remembering</td>
<td>recognize, list, describe, identify, retrieve, name</td>
<td>memorize and recall facts</td>
<td></td>
</tr>
<tr>
<td>Understanding</td>
<td>describe, explain, estimate, predict</td>
<td>understand and interpret meaning</td>
<td>LOWER</td>
</tr>
<tr>
<td>Applying</td>
<td>implement, carry out, use, apply, show, solve</td>
<td>apply knowledge to new situations</td>
<td></td>
</tr>
<tr>
<td>Analyzing</td>
<td>compare, organize, cite differences, deconstruct</td>
<td>break down or examine information</td>
<td></td>
</tr>
<tr>
<td>Evaluating</td>
<td>check, critique, judge hypotheses, conclude, explain</td>
<td>judge or decide according to a set of criteria</td>
<td>HIGHER</td>
</tr>
<tr>
<td>Creating</td>
<td>design, construct, plan, produce</td>
<td>combine elements into a new pattern or product</td>
<td></td>
</tr>
</tbody>
</table>
Bloom’s Taxonomy

• **Knowledge:** Key Words
  • Define
  • Identify
  • List
  • Show
  • Label
  • Examine
  • Name
  • Write
Bloom’s Taxonomy

- **Comprehension:** Key Words
  - Summarize
  - Interpret
  - Contrast
  - Predict
  - Associate
  - Distinguish
  - Estimate
  - Differentiate
  - Discuss
Writing Learning Objectives

**Formula:** Who will be able to do how much of what by when

Measurable action word
“Learning Objectives” collected from actual UCSF SOM syllabi:

- “This lecture will cover benign solitary liver masses and their appearance at CT”
- “We will review the appearance of important lines and tubes on CXRs”
- “Understand the role of radiology in the management of cancer patients”
Writing Learning Objectives

“This lecture will cover benign solitary liver masses and their appearance at CT”

The Problem: This is a teaching objective

The Fix: The student will be able to identify cysts, hemangiomas, and focal nodular hyperplasia at CT following the lecture.

Who: The student

Action word: identify

What: cysts, hemangiomas, and focal nodular hyperplasia at CT

By when: following the lecture
Writing Learning Objectives

“We will review the appearance of important lines and tubes on CXRs”

**The Problem:** This is a teaching objective

**The Fix:** The student will be able to recognize feeding tubes and central venous lines on CXR following the small group exercise.

- **Who:** The student
- **Action word:** recognize
- **What:** feeding tubes and central venous lines on CXR
- **By when:** following the small group exercise
Writing Learning Objectives

“Understand the role of radiology in the management of cancer patients”

The Problems: This is a bad learning objective
• “Understand” is too vague – not in Bloom’s!
• Too broad

The Fix: The student will be able to discuss current recommendations for screening mammography by the end of the course
Writing Learning Objectives

“Understand the role of radiology in the management of cancer patients”

The Problems: This is a bad learning objective
- “Understand” is too vague – not in Bloom’s!
- Too broad

More “bad” action words:
- Appreciate
- Know
- Learn
- Believe
Writing Learning Objectives

- Shortcut to avoid redundancy in a list of objectives....

“After the session the student will be able to..”
Writing Learning Objectives

“After the session the student will be able to..”

Recognize a pleural effusion at CXR

Describe signs of a pneumothorax at CXR

Differentiate between pulmonary vascular congestion, interstitial pulmonary edema, and alveolar edema on CXR
Writing Learning Objectives

• When planning a curriculum it’s preferable to have learning objectives that represent a variety of cognitive domains

• Mix it up!!
Writing Learning Objectives: Assessment

• Test questions should be guided by learning objectives
• Do not ask a question with a higher cognitive domain than expressed in the relevant learning objective
  ➢ Knowledge level objective (list, label etc..) should lead to knowledge level question (Identify the aorta on this chest x-ray...)

Writing Learning Objectives: Assessment

• There is some subjectivity to ranking levels in Bloom’s
• Not everyone will agree!

• The Bloom’s level is affected by how the material is taught
Grey zones
Writing Learning Objectives: Grey zones

Who will be able to do how much of what by when

• How specific versus broad?
• How many objectives are reasonable for a session or lecture?
• Do these limit “testable” information too much?
Writing Learning Objectives: Take Home Points

• Distinguish a learning objective from a teaching objective
• Use the format:
  ➢ Who will be able to do how much of what by when
• Use Bloom’s taxonomy to choose an action word to fill in the “do how much”
• Link test questions to your learning objectives
How to Capture Your Teaching Goals: Writing Learning Objectives

UCSF Dept. of Radiology
Emily M. Webb, MD