Constructing Effective Assignments, Problem Sets & Exam Questions

Best Practices for Teaching and Learning

Massachusetts Institute of Technology

MITx

TLL Teaching & Learning Laboratory

Goal

To illustrate how to apply **Bloom's Taxonomy** to design **effective** homework and exam **questions**.

Learning Objectives

By the end of this session, you will have considered ways to:

- **Formulate** and **organize** the use of problem sets and assignments in your course to enhance student learning.
- **Evaluate** homework and exam problems using Bloom's Taxonomy.
- **Create** homework and exam problems that align with your desired learning objectives.

Brainstorming Session

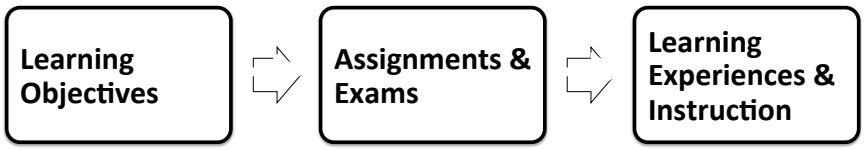
What are characteristics of **effective** problem set or exam questions?

Effective Problem Set Characteristics

Effective questions …

- are clearly written and well-defined
- are challenging without being too challenging or too easy
- inspire students to learn
- are related to course material

The Backward Design Process



What is important?	How do you know if they get it?	How do you help them get it?
SESSION 2	SESSION 3	SESSIONS 4 & 5

Modified from Wiggins & McTighe, Understanding by Design, p. 18

Outline

Part 1: Logistics

Part 2: Development

Logistics

1. Frequency of problem sets
2. Coordinate problem sets with lecture topics
3. Specify collaboration policy
4. Provide students with examples for how to solve problems
5. Provide appropriate feedback
6. Check in with students to see how long homework is taking

Gross-Davis, B. (1993) *Tools for Teaching*.

Outline

Part 1: Logistics

Part 2: Development

Development

1. Consider making the first assignment a review or using it as a pre-test
2. Vary sources
3. Vary the level of cognitive skills & knowledge
4. Ask students to describe how they solved a problem of their or your choice
5. Check and do problems before assigning them

Gross-Davis, B. (1993) *Tools for Teaching*.

Discussion

- *Ersatz Learning, Inauthentic Testing*, John McClymer & Lucia Knoles
- *Assessing student learning: a common sense guide*, Linda Suskie
  - Chapter 10: Creating an Effective Assignment

Discussion Questions

- Do you have any questions or comments about the readings?
- Do you have any experience with a course that did not have meaningful assessments?
- How can we develop more meaningful problems or authentic testing situations to prepare our students?

Pair-Share Activity

1. Select one problem from the handout.
2. Identify the problem's core concept.
3. Determine the level of Bloom's Taxonomy that characterizes the cognitive level of the problem.
4. Develop two new questions that address the same core concept, one for a higher cognitive level and one for a lower cognitive level of Bloom's Taxonomy.

Think-Pair-Share Activity

1. Select one problem from your textbook.
2. Identify the problem's core concept.
3. Determine the level of Bloom's Taxonomy that characterizes the cognitive level of the problem.
4. Develop two new questions that address the same core concept, one for a higher cognitive level and one for a lower cognitive level of Bloom's Taxonomy.

Summary

- Logistics and development of the design of effective assessments
- Evaluate the cognitive level of questions using Bloom's Taxonomy
- Develop your own questions that align with your learning objectives