Moving Forward Using Backward Course Design: Alignment of Goals, Instruction, and Assessment

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Cori Fata-Hartley (fatahart@msu.edu)
Lyman Briggs College and Office of Faculty and Organizational Development
Michigan State University

Workshop Goals
• Participants will understand that instructional design evolves backward from clear objectives and is aligned across all three stages of backward design.

• Participants will understand the value of articulating clear learning goals and objectives.

Workshop Learning Objectives
• Participants will be able to apply the principles of backward design when refining or developing a course.

• Participants will be able to evaluate the alignment of learning objectives, instructional materials and activities, and assessments in their own courses or when given examples from other courses.

• Participants will be able to develop learning and objectives based on Bloom’s taxonomy.

Handouts
3 Stages of Backward Design
Backward Design of a Teachable Unit (Overview and Example)
Learning Objectives Worksheet
Learning Objectives Rubric
Bloom’s Taxonomy Action Words
Resources
3 Stages of Backward Design

Identify the Desired Results

Determine Acceptable Evidence

Plan Learning Experiences

Are the desired results, assessments, and learning activities ALIGNED?
Backward Design of a Teachable Unit

<table>
<thead>
<tr>
<th>Learning Goals</th>
<th>Assessment</th>
<th>Activities</th>
<th>Alignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>What should students know, understand, and be able to do?</td>
<td>How will I determine whether students have met the learning goals? How will students assess their own learning?</td>
<td>What activities will engage a diverse group of students in learning?</td>
<td>Do the activities and assessments help the students achieve the learning goals?</td>
</tr>
</tbody>
</table>

Adapted from Scientific Teaching, p. 89
# Backward Design of a Teachable Unit

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<tr>
<td><strong>Learning Goal:</strong> Understand the molecular structure and function of cell membranes.</td>
<td><strong>Exam Question:</strong> During drug design researchers may modify drugs by adding functional groups to the chemical of interest. Suppose a researcher wanted to modify a drug to make it more likely to pass through plasma membranes. How might she modify the drug? Explain your reasoning.</td>
<td><strong>Text book reading</strong>&lt;br&gt;Mini-lecture&lt;br&gt;Homework assignment on membrane photobleaching.&lt;br&gt;In-class problem solving activity on membrane solubility.&lt;br&gt;Data analysis of Singer and Nicolson paper in recitation.</td>
<td>Do the activities and assessments help the students achieve the learning goals?</td>
</tr>
</tbody>
</table>

**Learning Objective:** Predict the ability of a given molecule to travel through a membrane.
<table>
<thead>
<tr>
<th>Goal</th>
<th>Learning Objective</th>
<th>Bloom’s Educational Objective</th>
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<tbody>
<tr>
<td>1.)</td>
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<td>1.5)</td>
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<td>2.)</td>
<td>2.1)</td>
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</table>
# Learning Objective Rubric

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>LEVEL OF COMPLETION</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Comprehensive</td>
</tr>
<tr>
<td></td>
<td>Intermediate</td>
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<tr>
<td></td>
<td>Cursory/Absent</td>
</tr>
</tbody>
</table>

Learning objectives describe what performances or behaviors will indicate the accomplishment of the learning goals. Students will know what is expected of them.

**Comprehensive**
- It is clear what students will know, understand, and be able to do after they have completed the given activities.
- It is clear what specific behaviors, skills, and performances demonstrate understanding.
- The objectives are aligned with the overall learning goals.
- Objectives include active verbs that can be measured.
- Objectives include behaviors described in Bloom’s Taxonomy of Educational Objectives.

**Intermediate**
- The objectives are somewhat clear, but students need more information to know what is expected of them.
- Not all objectives are aligned with the learning goals.
- Some verbs non-functional and cannot be measured.
- Some objectives do not clearly relate to Bloom's Taxonomy.

**Cursory/Absent**
- The goals and objectives are inadequate. They may be too vague, ambiguous, broad, ambitious, detailed or focused. There are no descriptions of expected performances or behaviors. *Students will not know what is expected of them.*
- Goals and objectives are not aligned.
- Only non-functional verbs are used.
- Bloom’s Taxonomy is not used.
Bloom’s Taxonomy Action Verbs

<table>
<thead>
<tr>
<th>Definitions</th>
<th>Knowledge</th>
<th>Comprehension</th>
<th>Application</th>
<th>Analysis</th>
<th>Synthesis</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bloom’s Definition</td>
<td>Remember previously learned information.</td>
<td>Demonstrate an understanding of the facts.</td>
<td>Apply knowledge to actual situations.</td>
<td>Break down objects or ideas into simpler parts and find evidence to support generalizations.</td>
<td>Compile component ideas into a new whole or propose alternative solutions.</td>
<td>Make and defend judgments based on internal evidence or external criteria.</td>
</tr>
</tbody>
</table>

**Verbs**

- Arrange
- Define
- Describe
- Duplicate
- Identify
- Label
- List
- Match
- Memorize
- Name
- Order
- Outline
- Recognize
- Relate
- Recall
- Repeat
- Reproduce
- Select
- State
- Classify
- Convert
- Defend
- Describe
- Discuss
- Distinguish
- Estimate
- Explain
- Express
- Extend
- Generalized
- Give example(s)
- Identify
- Indicate
- Infer
- Locate
- Paraphrase
- Predict
- Recognize
- Rewrite
- Review
- Select
- Summarize
- Translate
- Apply
- Change
- Choose
- Compute
- Demonstrate
- Discover
- Dramatize
- Employ
- Illustrate
- Interpret
- Manipulate
- Modify
- Operate
- Practice
- Predict
- Prepare
- Produce
- Relate
- Schedule
- Show
- Sketch
- Solve
- Use
- Write
- Analyze
- Appraise
- Breakdown
- Calculate
- Categorize
- Compare
- Contrast
- Criticize
- Diagram
- Differentiate
- Discriminate
- Distinguish
- Examine
- Experiment
- Identify
- Illustrate
- Infer
- Model
- Outline
- Point out
- Question
- Relate
- Select
- Separate
- Subdivide
- Test
- Arrange
- Assemble
- Categorize
- Collect
- Compose
- Construct
- Create
- Design
- Develop
- Devise
- Explain
- Formulate
- Generate
- Plan
- Prepare
- Rearrange
- Reconstruct
- Relate
- Reorganize
- Revise
- Rewrite
- Set up
- Summarize
- Synthesize
- Tell
- Write
- Appraise
- Argue
- Assess
- Attach
- Choose
- Compare
- Conclude
- Contrast
- Defend
- Describe
- Discriminate
- Estimate
- Evaluate
- Explain
- Judge
- Justify
- Interpret
- Relate
- Predict
- Rate
- Select
- Summarize
- Support
- Value

http://www.clemson.edu/assessment/assessmentpractices/referencematerials/index.html
Resources

Books


Online Instructional Resources

http://fod.msu.edu/oir/online-instructional-resources

Understanding by Design by Wiggins and McTighe: A Summary
A summary of the "backwards design" model for instructional development, a curriculum design approach that begins with the desired end results and works backwards through the curriculum design process to achieve them.
http://pixel.fhda.edu/id/six_facets.html

Integrated Course Design
This article presents a rationale and thorough description of L. Dee Fink's model of integrated course design.

A Self-Directed Guide to Designing Courses for Significant Learning
L. Dee Fink, Director, Instructional Development Program, University of Oklahoma. Guidelines for designing a course that integrates learning goals, feedback and assessment procedures, and teaching/learning activities.

Designing Better Learning Experiences.
Dee Fink and his associates have put together multiple kinds of information on course and syllabus design: basics of course design, resources such as handouts and templates, examples of good course design, plus a listserv and special topics forum for communicating with others.
http://www.designlearning.org/