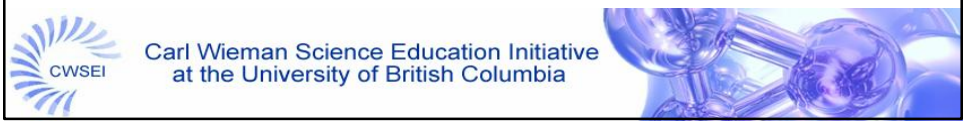
Learning Goals Workshop

May 2008



By the end of this workshop you will be able to:

- Define learning goals
- Distinguish between course and lecture level goals
- Use Bloom's taxonomy to help you write learning goals for your courses

Workshop plan of action

1. Introduction: Values of explicit goals
2. Course level goals
3. Topic level learning goals & Bloom's taxonomy
4. Assessment: building questions that inform

Learning Goals

- Who here uses learning goals on a regular basis? (or objectives, or aims, or purposes, or outcomes, or whatever)

Learning Goals

- What are learning goals?

Explicit learning goals

- What are learning goals?
  - Basically - What should students be able to do after completing course?
  - (How general attitudes or thinking are changed by course?)
  - Must be measurable - assessment and goals are tightly linked

Your goals

- Write a Course level learning goal for one of your courses
  - What is one really important concept or attitude that you want people to have at the end of your course?

Learning Goals

- Why is it be helpful (necessary!) to have learning goals?

Learning Goals

- Why is it be helpful (necessary!) to have learning goals?
  - better define and guide what you want to teach.
  - define for students what they should be learning (and why!).
  - essential for measuring what students are learning
  - to guide improvement of instruction
  - Are your students learning the main concepts?

Number code!

Goals

- Teaching is commonly viewed as being teacher-centered
- Students must do their own learning; we can't do the learning for our students
- Effective teaching focuses on *student learning*, not on teacher presentation
- **We design more effective courses if we focus on setting goals for the *students***, rather than for the faculty member.

From http://serc.carleton.edu/NAGTWorkshops/coursedesign/tutorial/goals.html

On the Cutting Edge - Professional Development for Geoscience Faculty

Designing Effective and Innovative Courses

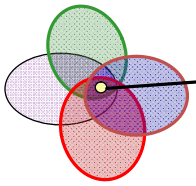
Topical Resources

Domains of learning

- Cognitive (Head)
  - (content)
- Psychomotor (Hands)
  - (Skills)
- Affective (Heart)
  - (Beliefs and attitudes)
- Metacognitive
  - (reflective, how are you thinking)

4 - 8 Course-level learning goals

Cognitive
Psychomotor
Metacognative
Affective



One Lecture-scale Learning Goal could touch upon 3 course-level goals

Course-level learning goals

Recognize that the behavior of the world around you is not magical and mysterious, but rather can be understood and predicted using certain fundamental principles.

Describe the properties and motion of electric charges and use this knowledge to predict and explain various aspects of electricity.

Lecture-level learning goals

Be able to design and build a fluorescent light bulb.

Explain and justify the requirements on the various basic components.

Syllabus/Topic list Vs. Learning Goals

Familiar
… good place to start

→ expand into learning goals.

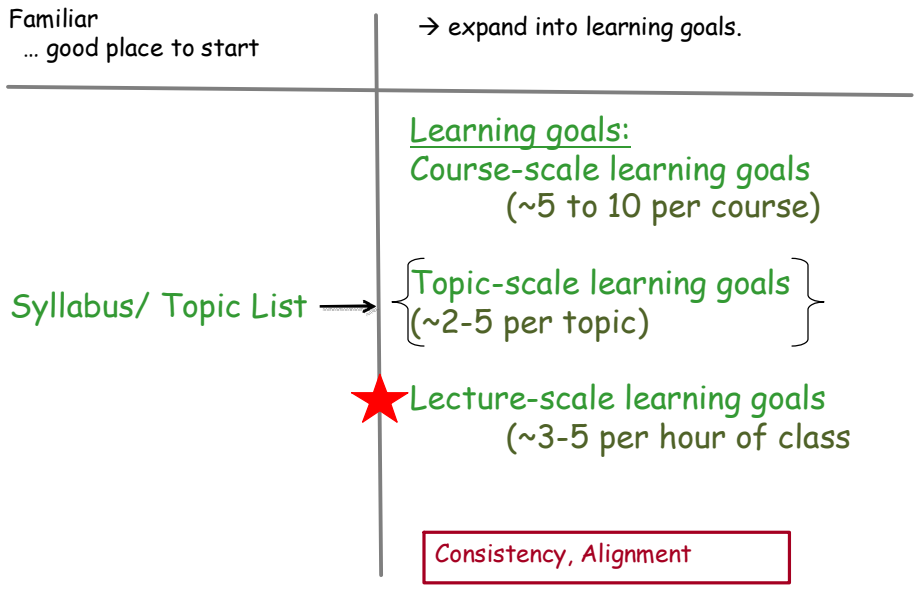
Syllabus/ Topic List
• Material covered (and time spent)

Learning goals:
Outcome and student oriented:

• Identifies what students will be able to do as a result of learning

• Defines what students are expected to learn

From Syllabus/Topic list To Learning Goals



Now, how to develop goals?

- Articulating learning goals takes considerable care.
- Assessment => **key link** between learning goals and student achievement.
  - Feedback to students = formative assessment.
  - It should inform both students **and** instructors.

Bloom's Taxonomy of Learning

1. Factual Knowledge: remember and recall factual information
2. Comprehension: demonstrate understanding of ideas, concepts
3. Application: apply comprehension to unfamiliar situations
4. Analysis: break down concepts into parts
5. Synthesis: transform, combine ideas to create something new
6. Evaluation: think critically about and defend a position

Bloom's Taxonomy of Learning – with verbs

1. Factual Knowledge: remember and recall factual information
   Define, List, State, Label, Name, Describe
2. Comprehension: demonstrate understanding of ideas, concepts
   Describe, Explain, Summarize, Interpret, Illustrate
3. Application: apply comprehension to unfamiliar situations
   Apply, Demonstrate, Use, Compute, Solve, Predict, Construct, Modify
4. Analysis: break down concepts into parts
   Compare, Contrast, Categorize, Distinguish, Identify, Infer
5. Synthesis: transform, combine ideas to create something new
   Develop, Create, Propose, Formulate, Design, Invent
6. Evaluation: think critically about and defend a position
   Judge, Appraise, Recommend, Justify, Defend, Criticize, Evaluate

Higher level: Require deeper conceptual understanding

Practice thinking about Goals

Examples of goals: Imagine you are a student, discuss these with your colleagues.

What do you like about them? What would you change? What level are they at?

- *Explain what causes natural hazards, and how different hazards interact, in terms of physical processes.*
- *Compare relative risks of different natural hazards to your community by referring to return rates, severity of effects, and costs of mitigation options.*
- *Identify aspects of a news article about an earthquake that should be justified with references to more specialized studies.*

Developing Lecture level goals

- Lecture level goals define what students can do after learning.
- Each should be consistent with at least one course-level goal.
- Keep in mind learning "domains":
  - CONTENT
  - SKILLS
  - HABITS OF MIND
  - AFFECTIVE & BELIEFS

Lecture level learning goals (3-6 per class period)

Example:

- Understand how a fluorescent light bulb works.
- Or …..
- Be able to design a fluorescent light bulb and to explain and justify the requirements on the various basic components.

Lecture level learning goals (3-6 per class period)

Check-list for creating topic-level learning goals:

- ✓ Is goal expressed in terms of what the student will achieve? Does it identify what students will be able to do after the topic is covered?
- ✓ Is the Bloom's level of the goal aligned with your expectations for students' learning … Is this what students will be able to do if they "understand" the topic at the level you want?
  - If you expect reasoning for "why", does it convey that?
  - Could you expect a higher level goal?
- ✓ Is it well-defined?
- ✓ Is it clear how you would test achievement?
- ✓ Do chosen verbs have a clear meaning?
- ✓ Is terminology familiar/common? If not, is the terminology a goal?

Not every goal can achieve the following, but it is better if you can:

- ✓ Is it relevant and useful to students? (e.g. connected to their everyday life, or does it represent a useful application of the ideas).

Your goals

- Write a lecture level learning goal (or two) for one of your courses
- In groups of 3-4 share this with your neighbours and discuss (you will have a couple minutes each)

Summary

- Revisit out goals
  - Define learning goals
  - Distinguish between course and lecture level goals
  - Use Bloom's taxonomy to help you write learning goals for your courses