Designing a University Level Course: A Practical Approach

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Designing a University-Level Course: A Practical Approach

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Teaching as Art and Science

design syllabus
conduct discussions
create lesson plans
instill motivation
encourage independent learning
prepare exam questions
grade exams
plan lecture
deliver lecture

Both aspects are learnable
Vincent van Gogh decided to learn to draw in his early thirties.
After a year of practice, limiting himself to pencil sketching, he completed this study.

(He died in 1890 at the age of 37.)
Introductions

- Your Name
- Upcoming course you’ll be teaching
- Brief description of what you want to gain this evening
Session (Target) Objective

- **WHO**
  - PT Instructors in WSE

- **WHAT**
  - Construct/Design a university-level course

- **HOW**
  - Hands-on exercises and proven pedagogical techniques and tips
Target Objective
Reworded in standard format

Given hands-on exercises and proven pedagogical techniques and tips,

*PT Instructors* in *JHU/WSE*

will be able to design and construct

an effective university-level course.
Enabling Objectives

in no particular order

- Identify elements of “good teaching”
- Apply Bloom’s Taxonomy
- Evaluate own teaching style
- Recognize strengths and limitations of different teaching methods and learning styles
- Understand basic pedagogical/cognition concepts
- Complete templates for objectives, syllabus, lesson
- Locate followup resources

Verbs, verbs, verbs, verbs...
Session Overview

■ Building Blocks of “Good Teaching”
  – learning models
  – common teaching situations
  – Self-evaluation of Teaching Style
  – *Tour of Berkeley Compendium*

■ Nitty Gritty of Constructing a Course
  – Bloom’s Taxonomy
  – course objectives
  – outline & syllabus
  – individual class sessions
  – *Tour of Stanford Online Handbook*

■ Q&A, Further Resources
  – Session website at [http://people.ne.mediaone.net/jriley/wse/](http://people.ne.mediaone.net/jriley/wse/)
  – *Tour of University of Nebraska TLC, session website*
What are the goals of “good teaching”?

- communicate field’s body of knowledge
- encourage independent learning
- instill motivation

Teaching is an art AND a science - and both elements are learnable
Thinking about learning...

- Humans retain:
  - 20% hear
  - 40% see and hear
  - 75% see, hear and do (Oz and White, 1993)

- Sample Brain Models
  - Sensory Input Model
  - Hermann Brain Dominance Instrument
  - Meyers Briggs Type Indicator
Meyers Briggs Type Indicator

- *Where do you get your energy?*
  - Extrovert vs. Introvert

- *How do you pay attention?*
  - iNtuiting vs. Sensing

- *How do you make decisions?*
  - Feeling vs. Thinking

- *What are your standards for living?*
  - Judging vs. Perceptive
Typical Engineering Course Orientation

= ISTJ?

- **Introverts**
  - lectures and individual assignments

- **Sensors**
  - focus on details, facts and procedures

- **Thinkers**
  - abstract analysis, logic, rules

- **Judgers**
  - objective deadlines, closure

Felder, R. Matters of Style in ASEE PRISM, Dec 1996
A different twist

Effective education teaches to students’ learning style weaknesses as well as their strengths. [...] An objective of education should thus be to help students build their skills in both their preferred and less preferred modes of learning.

Felder, R. Matters of Style in ASEE PRISM, Dec 1996
Factoring the Instructor into the Equation

- How might your “personality type” affect your teaching?
  - Preferred style = comfortable and easy
  - Less preferred modes = challenge

- Keirsey Temperament Sorter available at
  www.keirsey.com/cgi-bin/keirsey/newkts.cgi
Break?
Standard Teaching Approaches

- “Sage on the Stage”
  - Lectures
  - AV presentations

- “Guide on the Side”
  - Discussion
  - Case studies, role plays
  - Lab work, simulations

Good teaching almost always involves a combination of approaches
What a lecture is NOT:

“...an unaccented accumulation of factual data that you fire at the heads of the young.”

Gordon Craig, History Prof Emeritus, Stanford University
Lecturing

- **Structure**
  - unified, 3 part segments
  - coordinate with text and assignments
  - develop 2 - 4 major points/concepts

- **Pace**
  - human attention span = approx 10 min
  - better cut than rush!
  - build a case, provide good transitions

- **Presentation**
  - vary voice, movements, expression, tempo
  - take questions - improvise

- **Excellent article:** Lectures and Approaches to Active Learning  
  Seeler, Turnwald and Bull, 1993
Why 3 hours of lecture is just too much ...

- Higher order thinking tasks cannot be learned via lecture.
- The human attention span has genuine limits
- Article: "Why We Must Change: The Research Evidence" Gardiner, 1998
- "If students are not thinking during lectures, what are they doing?...Up to 15 percent of their time is spent fantasizing."
How Adults Receive Information

Visual 87%

Auditory 7%

Tactile 6%

Source: Catapult Inc. Train the Trainer Courseware v 1.
Audiovisual Tools
Discussions

"... involving students in discussion fosters retention of information, application of knowledge to new situations, and development of higher-order thinking skills -- and discussions do this much better than lectures do. ...

... Yet 70% - 90% of professors use the traditional lecture as their primary instructional strategy."

"Why We Must Change: The Research Evidence" in Thought & Action Gardiner, 1998
Asking Questions

- Prepare some questions in advance - use Bloom’s Taxonomy
- Avoid yes/no and “fishing expeditions”
- Sequence questions from familiar to complex
- Wait after question and after answer
Encouraging Participation

- Prepare some questions in advance
- Be respectful
- Give students time to think
- Ask a student to comment on another student’s response
- Positively reinforce participation (correct and incorrect responses)
- Invite students to contribute discussion topics
- Know and use students’ names
What are your strengths and weaknesses as they relate to teaching your course?

How can you bolster weak areas?
Berkeley’s “Faculty Self-Assessment of Teaching”

Not at Very Doesn't
all Descriptive Descriptive don't know

In teaching this course, I:

1. Discuss points of view other than my own (see Section One)
   1 2 3 4 5 (   )
2. Discuss recent developments in the field (see Section Two) 1 2 3 4 5 (   )
3. Give references for more interesting & involved points (see Section Three) 1 2 3 4 5 (   )
4. Emphasize conceptual understanding (see Section Four) 1 2 3 4 5 (   )
5. Explain clearly (see Section Five) 1 2 3 4 5 (   )
6. Am well prepared (see Section Six) 1 2 3 4 5 (   )
A Tour of Univ. California Berkeley’s Compendium of Teaching Tips - followup resource for The Berkeley Faculty Self-Assessment Instrument
Break?
Part II: Constructing a Course the E-Z Way

1. Determine the course’s target objective
2. Brainstorm enabling objectives
3. Prioritize enabling objectives
4. Fit objectives into term schedule
5. Prepare Syllabus
6. Organize individual sessions.
Determining Course’s Target Objectives

- Very very very specific
- Measurable
- Work backwards
- **Who/What/How**
- **Learning Objectives** - not Teaching Objectives!
  - teaching obj: *present, introduce, provide, impart, prepare*
  - learning objectives: *demonstrate, evaluate, analyze, identify...*
Bloom’s Taxonomy of Learning Objectives

- **Recall**
  
  *list, define, tell, describe, identify, show, label...*

- **Comprehension**
  
  *summarize, describe, interpret, contrast, predict...*

- **Application**
  
  *apply, demonstrate, calculate, solve, examine...*

- **Analysis**
  
  *analyze, separate, order, explain, connect, classify...*

- **Synthesis**
  
  *combine, integrate, modify, rearrange, substitute, plan, create...*

- **Evaluation**
  
  *assess, decide, rank, grade, test, measure, recommend...*
Target Objective Samples

- understand Newton’s Second Law of Motion

- know how to create WWW pages

- Given a written statement involving the mass and acceleration of a body, the student could calculate the force applied.

- Using the 18 basic HTML codes, the student will be able to create a webpage and successfully transfer the file to an httpd server
Evaluating Target Objectives - Online Examples

- Specific “…will be able to”?
- Measurable?
- Learning as opposed to teaching objectives?
Determine Your Course’s Target Objective *(see handout Step 1)*

Ask yourself:

- How would a colleague know a student had successfully completed my course?
- “At the end of my course, students will be able to…”
- Can I define one concrete, over-arching concept or skill that encompasses all the rest?
- What is “the point” of my course?
Enabling Objectives

- brainstorm enabling objectives from your target objective
- determine elements worth teaching time
- Brainstorm in random, uninflected order
- consult textbooks, journals, colleagues
Brainstorm Enabling Objectives for your course’s Target Objective

See handout Step 2

Ask yourself:

- What sorts of things will my students need to know or do to accomplish the target objective?

- What are my favorite stories, activities, exercises related to the target objective?

- What verbs from Bloom’s Taxonomy jump out at me as important for my students in this course?
Organize Your Brainstormed List of Enabling Objectives

See handout Step 3

- **Logical flow** - Chronological? Abstract to Specific? Towards a specific skill?

- **order should build on itself**

- **assess the list for:**
  - substance
  - flexibility
  - coherence
  - flow
Fit the Organized List into Term Schedule
Handout Step 4

- first class often aims to cover “introduction and motivation”
- last class is dedicated to final exam or project presentation
- mid-term checkpoint somewhere in the middle.
- Some objectives may span more than one class session.
Standard Syllabus Contents

- Course description
- Course prerequisites
- Topics, assignments and exams listed by date
- Grading and attendance policies
- Textbook(s)
- Office hours, phone number, e-mail address
Create a Syllabus Outline for Your Course

• Handout Step 5
Designing a Class session

1. Take Unit and Session Objectives from ordered list

2. What activities would best match my session objectives? (Check out Activity Construction Wheel based on Bloom)

3. What time allocation will I make for these activities?

4. What AV tools will I use to present the activities?

5. How will I know how well students have met session objectives?

6. What assessments will help me teach this better next time?

adapted from University of Nebraska Lincoln Teaching Tips
Activity Oriented Construction Wheel Based on Bloom’s Taxonomy

Source: http://www.stedwards.edu/cte/bwheel.htm
Create the Session Plan

- **Introduction**
  - followup from last class, pre-test, state the day’s obj

- **Motivation**
  - why the objectives are important, anecdotes

- **Information**
  - guts of the day’s obj - lecture, demo, film, examples

- **Practice**
  - activities, discussion, lab, with instructor feedback

- **Wrap-up**
  - summarize, answer questions, application, transition to next topic/session
Create a plan for one session of your course

See handout Step 6
What activities best meet the session
A Tour of Stanford University’s Online Handbook “Teaching at Stanford

http://www-ctl.stanford.edu/teach/handbook.html

- lecture tips
- grading checklist
- exam checklist
- dealing with nervousness
Forms of Evaluation

- 2-way forms of communication
  - topic, session, unit, course
- test, quiz, assignment, feedback
- have students contribute to decisions?
- Re-assess grades in private
- Be clear
- Be prompt
First Day Anxiety?

"...meeting a group of strangers who will affect your well being, is at the same time exciting and anxiety producing for both students and teacher."

McKeachie, 1986

“Research on the first day of class showed there was a real desire on the part of both students and teachers for connectedness, but neither group realized the other shared that desire.”

Knefelkamp
A Tour of University of Nebraska-Lincoln Teaching & Learning Center’s Teaching Tips

Http://www.unl.edu/teaching/Teachtips.html
For more information

- **University of Nebraska Lincoln**
  [http://www.unl.edu/gradstudies/current/teaching/tips](http://www.unl.edu/gradstudies/current/teaching/tips)

- **Stanford University**
  [https://teachingcommons.stanford.edu/teaching-talk](https://teachingcommons.stanford.edu/teaching-talk)

- **University of California Berkeley**
  [http://teaching.berkeley.edu/teaching-resources](http://teaching.berkeley.edu/teaching-resources)

- **UMass Boston Center for Innovative Teaching**
  [http://www.umb.edu/cit](http://www.umb.edu/cit)
Discussion

- Questions?
  - Re/concerns not covered? Creating tests and quizzes? Selecting textbooks? First day of class particulars?

- Comments?
  - re/ what worked and didn’t work in this session?