Course and Syllabus Design
for Active Learning and Critical Thinking

(Or, how I saved a lot of time, improved my students’ performance, and started enjoying my teaching a lot more)

IPFW
12:45 – 2:45

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What are the targets for effective course design?

1. Greater student sense of responsibility for his/her own learning
2. Higher student achievement and performance
3. Greater student commitment and motivation (“buy-in”) 
4. Less gratuitous resistance and distracting behavior from students
5. Less time and other resources spent on trivial matters that do not support student learning (e.g., policing)
6. More relevant assessment and accountability (e.g., testing, grading that mean something)
7. More fun and deeper satisfaction for the instructor, in knowing that the course is having a planned and permanent impact on students.
A short test. At your tables, please work as a group to answer the following question.

Imagine yourself as an enterprising student. What can you get or do in a university course *that you cannot get or do (easily) elsewhere*?
Two things that make a university course uniquely valuable to students (Bill’s view)

1. Professor’s expertise (BUT ONLY WHEN expressed in a direct response to what students have attempted to do, say or think) (professional interactions, mentoring, feedback)

2. Fun of learning by struggling along with other students (peers, co-learners) to master the same ideas, skills, perspectives and attitudes

Design Key: Use in-class time to exploit the uniqueness of this opportunity. Use out-of-class time for everything else.
All effective course design begins with one core question:

What should your students be doing—at any given moment—so that you, as a teacher, can provide feedback and move them along in their thinking?

Even in a large class!
Example

(Please recuse yourself if you have a background in physics)

Your uncle gives you an old rifle (thinking you will use it to protect your home), but it is too heavy for you to handle. You decide to cut off several inches of the barrel to make it easier to manipulate.

How will this affect the speed at which bullets emerge from the barrel when the rifle is fired?

They will be a) slower; b) faster; c) unchanged. Why?
How will you find out for SURE what the answer is?
The conceptual question “How will barrel length affect the speed at which bullets emerge from the rifle?” requires a clear decision that drives the need for expert information.

Impulse-Momentum Theorem: $\Delta (p) = F \Delta t$

Momentum $(p) = m \vec{v}$

$m_{\text{rifle}} = 5\text{kg}; \ m_{\text{bullet}} = 50\text{g}; \ v_{\text{bullet}} = 140\text{m/s}$

$\Delta t = 0.50\text{s}$
The **Antenna vs the Radar**

Learning is the result of feedback on something you’ve done.
Implications for teachers

1. Your job is to “stage” what students do (decide) so they will make errors and benefit from feedback + better information.

2. Actions in the form of decisions force into students’ consciousness the relevance of course content.

3. Holding students accountable for the quality of their actions (decisions) teaches them responsibility.
Knowledge exists to inform actions/decisions

The “Critical Thinking Curriculum” is designed around decisions:

--practicing decisions
--planning decisions
--making decisions
--reflecting on decisions
--evaluating decisions
--improving decisions (with better information, better reasoning)
Teaching through decision progression

Naïve Decision $\rightarrow$ Informed Decision

Naïve Decision $\rightarrow$ Mistake $\rightarrow$ Information $\rightarrow$ Informed Decision
So, what should your students be doing \textit{(every day)} in order to exploit maximally the value of your expertise and your course?

\textbf{Try something} on their own or in groups (Act! Decide!)

\textbf{Produce something} that makes visible their comprehension (decision, sentence, solution)

\textbf{Say something} (defend a decision, summarize, describe, explain)
Guiding questions for efficient use of your time as teacher:

1. How will students make decisions (act!) in ways that are **permanently different** at the end of your course from how they were making decisions and acting at the beginning?

2. How will you know if they are doing this? (How will you measure their progress?)

*Everything else is smoke, mirrors, sound, & fury contributing to student distraction and faculty fatigue.*
How will students be **PERMANENTLY different in what they do**?

**Obvious:** What **big ideas of your discipline** will students henceforth be able to use to inform their decisions/actions—forever?!?

**Less obvious and sometimes overlooked:** What new skills, procedures, processes will they develop to improve their decisions/actions?

**Most important and usually ignored:** what **attitudes**, perspectives, values, and habits of thought (e.g., self-questioning; tolerance; persistence; sense of justice) will shape their decisions/actions (that did not shape their decisions/actions before)?

*Think about the course you are (re-)designing. Take a few minutes and write down 2 items for each of these categories.*
At your tables: introduce yourselves by name and department, and share with your partners one thing you wrote for each of these categories.

1. big ideas of the discipline that will inform actions
2. skills, procedures, processes that will improve actions
3. attitudes, perspectives, values, habits of thought that will shape actions

At your tables: As a group identify the most intriguing examples and prepare to report to the whole room.
What you wrote are your real goals, even if you have not yet put them in the syllabus.

So…Put them in the Syllabus!

(And make sure students read it!!!)
Words (especially verbs) matter for purposes of evaluation of learning. Compare:

“Become familiar” with Newtonian mechanics (Student: yes, I’m familiar with…)
“Understand” Newtonian mechanics (Student: yes, I understand…”)
“Know” Newtonian mechanics (Student: yes, I know that!)
“Appreciate” Newtonian mechanics (Student: Yes, I really appreciate…)
(WHAT DO THESE REALLY MEAN?)

to

“Recall” key principles of Newtonian mechanics (test of recall)
“Summarize” the key principles of Newtonian mechanics (essay)
“Demonstrate and explain” Newtonian mechanical principles (presentation)
“Identify” functions that illustrate Newtonian mechanics. (analyze case showing functions)
“Solve problems” using principles of Newtonian mechanics (project)
“Apply” Newtonian mechanical principles to new situations and phenomena (project; experiment design)
“Analyze” physical phenomena using Newtonian mechanics (case; problem)

(See handout on verbs)
Let’s practice...

- Work with a partner or as a whole-table group. Look at the goals on the syllabus from the course in Positive Psychology.

- Re-write goals 2, 3 and 5 using vocabulary and grammatical structures that make their meaning more explicit, concrete, active and easier to measure.
Other outcomes/goals to target?

Be able to think reflectively (i.e., self-assess, teach oneself)

Be able to “think like a ___________” (What is “thinking” in your discipline?)

(Attitudinal) Be persistent in the solving of difficult, unfamiliar problems

(Ethical) Integrate specific ethical values/concepts in analyzing disciplinary problems
Re-ordering the priorities

A **change of student attitude and perspective** will fundamentally and directly affect what students are able to learn how to do and what they will be able to retain as knowledge.

1. Make clear in your syllabus these targeted changes in attitude and perspective

2. Make clear to your students how your method/approach will support the changes in them you envision.

3. Make students DO something in the first 15 minutes of your first class meeting to PROVE to them that you know what you are talking about and that you mean what you say!!
Sample goals for a course on “History of Economic and Social Philosophy”

Students who successfully complete this course will be able to...

...summarize and reproduce accurately the arguments of major economic thinkers (“understanding” expressed as action)

...conduct analyses of familiar (local, nearby, ordinary) markets using economic principles and perspectives from history. (application of content to real world)
Writing Your Own Course Goals…

Think about a course that you will be teaching soon (e.g., summer or fall 2012).

Draft 2-4 goals for this course, using active language from the examples on the handout, or from your own imagination.
Work with a partner and exchange analyses of 2 of your goals.

- Do the goals state what *students* will be able to do when they finish the course?

- Has the author of the goals avoided all instances of “understand,” “know,” “be familiar with,” “appreciate,” and other vague notions?

- Are the goals measurable? (i.e., can you imagine how student progress toward them might be evaluated?)

- Do the goals imply that students will be engaging in active, authentic, motivating tasks?
Write an assessment for one of your course goals

Choose one of your more ambitious goals (e.g., changes in how students think as a result of their experience in your course).

Write down: what will they have to do by the end of the course to prove to you and to themselves that they have changed in the way you require?
Sample Goal from the “History of Economic and Social Philosophy”

Students who are successful in this course will be able to conduct analyses of small markets using economic principles and perspectives from history.
Sample capstone assignment for “History of Economic and Social Philosophy” (Thanks to Bob Wren, U of Texas)

Go to your nearest McDonald’s and take a seat where you can watch operations for 2 hours. Record notes for these two hours on the various processes of preparing and serving McD’s products, and on anything else, including observable management, marketing, client behavior, etc., that you determine to be relevant, with respect to the following task: Using the data you have collected, construct an argument in which you evaluate the validity of this claim: “The fast-food workplace is a contemporary confirmation of Karl Marx’s economic theories.”
Work in groups of 2 (or 3 if you have an odd number). Take turns doing this sequence:

1. Elect a first reader, who reads his/her assignment to his/her partner(s).

2. Partner(s): listen to the reader’s assignment/question and **do this analysis**: write down in detail all of the skills that a student would need to have *(a priori)* in order to succeed at the assignment. Share your list with the reader to see if you are in agreement.

3. When you finish, exchange roles and repeat process until you are asked to stop.
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What are the underlying tasks and activities that students would need to be able to do (i.e. what should they practice?) in order to be successful in this assignment?
Crucial design issue:

What will students be doing *daily* to develop the skills and practice applying the knowledge needed to reach these goals?
Backward Design

1. How will students be different? (attitudes; skills; knowledge)

2. How will you know if they are different?

3. **Process (your design focus):** What will students be asked to do daily in order to change (themselves) in the ways you have targeted?

   The core of your course is students’ **PRACTICE** using the ideas/content of your discipline to inform actions / make decisions.
1. What are the targeted changes?
2. How will you know if they happened?
3. How will students practice in order to undergo these changes?

These 3 questions need to be answered **BEFORE** finalizing and organizing the content that will be covered. The content is distributed so as to best serve the process.
The way the brain actually changes itself
The Learning Cycle from David Kolb

Concrete experience [1]

Testing in new situations [4]

Observation and reflection [2]

Forming abstract concepts [3]
What does a brain-aligned “learning sequence” look like?
(Example from the ballistics exercise—see handout)

Think: RADAR

1. **“Try something” new** (solve a new problem; make a decision; speculate; read something on your own and try to explain it) before you can be sure it’s “right” or “good.”
2. **Reflect** (Think!!!) on why you responded that way; decide on which information you would need to be more certain about what it means.
3. **Read, listen, study** to help you analyze and improve your first attempt to make sense of it.
4. **Try it again**, using more complete information.
Organize the course by learning units, not by chapters or articles

A **unit** is not a block of content.

A **unit** is a coherent, connected **sequence of student actions** leading to an outcome (product, performance, action) directly shaped by course goals.

Each **unit** targets/supports one or more of your course goals.

*The content of your course is selected to support and promote student thinking through the constructed sequence.*
Possible ways of organizing the units of course:

- By increasingly complex questions or modes of inquiry within the discipline
- By perspectives that gradually build toward comprehensive disciplinary thinking
- By principles that guide disciplinary thinking about the content
- By skills (professional; academic; dimensions of critical thinking)
- By types of thinking on the subject matter
- By various contexts (audiences; clients; roles; agents)
Take a few moments and sketch out some possible organizational schemata for your course. Stay away from content at this point.
Planning Task

Think of your course as a student’s trajectory from one way of thinking to another, more complex, more mature, more nuanced, more informed way of thinking.

**What are some possible stages of this journey?**

- What skills will need to be developed along the way?
- What are some key early steps and some key later steps in development that need to occur? (e.g., attitudinal and perspectival development)

Draft a possible sequence of stages for this intellectual journey (see example on next slide)
The shape of a journey

What will a beginner in the course likely do? (what’s the profile? Where will the problems be?)

At 1/3 way through, what will be different? How will he/she think differently? What will his/her intermediate skill set look like?

At 2/3 way through…. Etc.
Now that you’ve done the hard work of re-conceptualizing your course...
Don’t let your course policies undermine your design!!!
At your tables:
Articulate the difference between…

1. Papers are due April 3. Late papers will be penalized a letter grade for each day they are late.

2. For this paper, students may choose their submission date. Papers that are turned in on April 3 are eligible for 100 points. Papers turned in on April 4 are eligible for 80 points. Papers that arrive after April 5 are accepted and will receive feedback, but are eligible for 0 points.
A tale of two strategies

Try to control (via penalties) student behavior in order to improve performance,

Or,

Set a learning goal (choice with consequences) that will promote self-determination and self-awareness, leading to productive behavior.
Treating Students Like Adults: Choice and Accountability vs. Policing

Students need to be held accountable for class participation as expressed by **readiness and productivity**

**Self-Test for the professor:** if a student can miss many classes and still pass the course, what convincing arguments do you have that he/she should be required to attend class, other than your personal preference that he/she do so?
Treating Students Like Adults: Choice and Accountability vs. Policing

**Design key:** Set the expectation for daily participation via frequent small, but significant tasks, some graded, some not, to measure student readiness or attentiveness to ideas or material under discussion.

Use these tasks as the basis for discussion, rather than “cold-calling” on students or expecting them to volunteer.

Avoid “pop” quizzes: students know that these are all about the instructor’s power rather than the students’ learning.
Cell Phones and other distractions

Implicate students in classroom management:
Ask students on the first day how they prefer to address disruptive talking, cell phones, laptops, etc.
Remove confrontation

Self-test:

Does your syllabus set up a conflict that you must inevitably resolve when a student makes a bad choice, because they perceive you as having the power to punish or absolve?
Make it about THEM

Self-test:

Examine your syllabus and see how many times you use “I” or “me”

If your role is dominant in how you frame the course, your students will abdicate their responsibility and implicate you in their personal issues.
Ask students to participate in the establishment of definitions, rules and sanctions.

Make reflection on academic honesty a part of class culture and implicate students in the maintenance of academic integrity.

Ask students to examine cases and make judgments that show their understanding.

Provide opportunities for students to practice and evaluate the handling of sources (quoting, paraphrasing, citing).
## Summary: Changing what you choose to “Control”

<table>
<thead>
<tr>
<th>Traditional Classes</th>
<th>A New View</th>
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<tbody>
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<td>Control student compliance</td>
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- Control student preparation through penalties and threats
- Control time you spend on content
- Control disruptive student behaviors
- Contain students’ energy so as to avoid chaos

A New View:
- Control range of choices students make for self-management
- Hold students visibly accountable for performance and output
- Control rationale for students to prep content on their own; control student time on task using content
- Put students in the role of determining and managing the culture of the classroom.
- Use student energy to move the class by asking them to DO and/or say something all the time. (ENJOY the CHAOS!!)
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