Are we really successful at teaching critical thinking? In this session participants will clarify the challenge of teaching critical thinking, and experience practical, immediately usable notions of critical thinking, which will help make visible what is often left invisible in the work of the university instructor.

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You are the survivors of the journey to academe....
The overall goals of today’s sessions:

1. Re-discover (and re-conceptualize) the notion of a “beginner” in our disciplines

2. Clarify (both conceptually and experientially) our understanding of “Critical Thinking” in a way that sharpens our instructional purpose

3. Explore strategies for assignment, course and curriculum design, in light of this re-conceptualization

4. Begin learning and adopting a rhetoric that allows us to escape from the verbal and conceptual traps of the past, with respect to “teaching” and “learning”
The Case of the Troublesome Pit

Place take a few moments and read the short narrative that appears on the half-sheet.
The Case of the Troublesome Pit

Work in groups at your tables to answer the following questions about the case.

1. Given the test question, what seem to be the professor’s assumptions about what students should learn in this course?

2. What are the student’s assumptions about what she should learn in this course?
The Case of the Troublesome Pit

3. As an instructor with students like those in the case, what could you do to change their thought processes and learning attitudes?
Where is the Math Student in William Perry’s Scheme of Ethical and Intellectual Development?

1. Dualism
2. Multiplism
3. Relativism:
4. Commitment in Relativism
Take a minute and write:

What words occur to you when you hear “Critical Thinking”? 
Work in groups of 3 or 4

Merge your lists and then isolate (by consensus) the 3 most crucial and defining elements of critical thinking.

Prepare to share your list when called upon.
Learning as information-reception

VS

Learning as independent problem-solving
(using information)
It’s easy to change what people know.

It’s much harder to change how people think.

And then there is the corollary...
It’s easy to **assess changes** in what people know.

It’s much harder to **assess changes** in how people **think**.
“Critical Thinking is… self-directed, self-disciplined, self-monitored, and self-corrective thinking.”

(Richard Paul and Linda Elder)

How do we foster it?
Some (more) Dimensions of Critical Thinking

(it’s more than just reasoning skills)

- A self-awareness of your operating assumptions and dominant values
- A self-awareness of your thought process—of how you came up with an answer
- A self-awareness of change in your way of thinking
- Foundational: An attitude of inquiry (this can be learned!!)
What are the conditions for promoting critical thinking—as a teacher?

- Identify and make explicit precisely how critical thinking is manifested in your discipline (goals)

- Ensure that your tests and graded assignments (and course grades!!!!) actually address those same targeted dimensions.

- Ensure that lesson and course design target those same targeted dimensions (practice)

- Be willing to change how you teach when students fail to develop the targeted ways of thinking (i.e. think critically about your own teaching)
Our starting point:

promoting our own critical reflection as a model for promoting it in our students

Let’s explore analytically and critically a few elements of the teaching-learning process…
The question:

Which student study and preparation practices lead to highest performance on a simple test of knowledge (basic comprehension and recall)?
A formal study conducted by a professor of Psychology (McKelvie) from U Michigan...

- Beginning psychology course
- 200 “normed” students
- All students covered the exact same material
- All students took identical exam
- 5 Groups of students; 5 different preps
The Experiment

_____Group A:  Listened to the lecture, did not take notes, and took the exam one week later.

_____Group B:  Did not listen to the lecture, were given a copy of professor’s lecture notes, reviewed notes before taking exam one week later.

_____Group C:  Listened to the lecture, took notes, reviewed notes before taking exam one week later.

_____Group D:  Listened to the lecture, took notes, but did not review notes before taking the exam one week later.

_____Group E:  Did not attend lecture, did not receive a copy of the lecture notes, were not enrolled in the course, had never taken the course, and took the exam cold.

(Adapted from the Canadian Journal of Behavioural Science, Vol. 18, no. 1)
Work alone:

Rank the performance of the student groups from best to worst:

1 = Best      5 = Worst

WRITE DOWN YOUR RANKINGS in the space next to each item
Work in groups at your table. As a group now combine your thinking to reach consensus on your prediction.

1 = Best     5 = Worst

Record your team’s final answers on the separate sheet of paper (one set of answers only)
Based on your team’s answers, what are your assumptions about what students need to do for basic retention of information?
Let’s see how you ranked the preparation strategies
Time out!!
Facilitating critical thinking

1. Task (serious but playful): Ask for a decision requiring students to work with incomplete information (e.g., interpretation; prediction; assessment of new situations)

2. Structure the decision as a “choice” among limited options

3. Encourage an analysis of the decision (by asking for consensus).

4. Make explicit the assumptions driving decisions.

5. Provoke reflection: Compare students’ thinking with actual results; look at additional information
The Experiment

_____**Group C**: Listened to lecture, took notes, reviewed notes before taking exam.

_____**Group B**: Did not listen to lecture, were given professor’s notes, reviewed notes before taking exam.

*Differences between these groups were statistically insignificant:*

**Group A:** Attended lecture, did not take notes, and took exam.

**Group D:** Attended lecture, took notes, did not review notes before taking exam.

**Group E:** Were not in the course, had never taken course, did not attend lecture, took the exam cold.
In light of this experiment, which of the following practices proved more or less important for retaining information and performing well on exams:

- Listening to a lecture
- Attending class
- Taking notes
- Taking time off to let memory do its work
- Reviewing notes before an exam
- Having accurate notes to study
**Time out!!**

Facilitating critical thinking

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6. Make explicit any changes in thinking
Attitude development is the goal

1. Frequent experiences (practice) making decisions and explaining/defending them. (takes time—see Mazur, Felder)

2. Group/Team-based tasks that allow candid analysis without the presence of an authority (see Michaelsen and Fink)

3. Public comparisons of group decisions to model critical reflective process (see Michaelsen)

4. Challenging tasks (and grading schemes) that do not overly penalize failures for experimental thinking
Speculative inquiries that model and foster critical thinking
(“educated guess” BEFORE coverage)

**Psychology:** Which of these practices aids memory?

**Art:** Which of these 4 artists is mostly likely to have painted this picture. Why?

**Chemistry:** If you add Ajax Detergent to this solution, which of the following is most likely to happen? Why?

**History:** Which of the following persons is the most likely author of this document? Or, When was this document most likely to have been written?

Why? Why? Why?
The role of incomplete information

- Gaps in information force judgments that uncover students’ assumptions.

- Observing how students fill in gaps allows us to assess their thinking process and not merely the accuracy of their answer.
Some critical thinking questions prompted by McKelvie’s study

1. What’s the real function of a lecture? A reading assignment?

2. If McKelvie’s data is valid, and it doesn’t matter much whether students read or listen to a lecture on the same content, what are the implications for the design and sequencing of learning activities?

3. What’s the best use of class time?

4. How can we ensure that students to cover the lecture material on their own outside of class, so class time can be used for more ambitious goals?

5. ???
Next up…

Let Data Drive Student Inquiry

(Structuring student encounters with the content of our discipline)