Decoding the Disciplines: Getting Clear for Assessment and Mentoring

Warmup: Think of an assignment you give where significant numbers of students who are doing the work have difficulty or think of an error your students who are doing the work persistently make.

Handout 1: The Decoding the Disciplines Cycle
Video: A Bottleneck Interview in Physics
Handout 2: Step 4 Practice Example in History
Handout 3: Outcomes Assessment Procedure
Handout 4: Chemistry Assessment example
Handout 5: Visual Assessment example
Handout 6: References

The best teachers constantly monitor what is happening to students as they set about learning and investigate when things do not proceed as planned or expected. They also enquire their own practice so they might get better at ensuring that their students learn successfully.

Decoding the Disciplines

The "Decoding the Disciplines" Cycle

1. What is a bottleneck to learning in this class, a place where many students consistently fail to master crucial material?

2. What do specialists do so they get past this bottleneck?

3. How can I explicitly model these operations for students?

4. How can I give my students an opportunity to practice and get feedback on each of these operations?

5. How can I motivate students and address the affective side of learning?

6. How can I tell whether students have mastered these operations by the end of the process?

7. How can I share what I have learned with others?
What Questions and Goals Should Be the Focus My Work for the Week?

**Questions:**
- In what ways did secular notions of progress take the place of the notion of an Apocalypse?
- What historical factors encouraged this change?
- What assumptions about human beings, the world, etc. underlay Condorcet’s vision of the future?
- In what ways did mental patterns from Apocalyptic thinking carry over into ideas about progress?

**Goals:**
- Learn to use primary sources to understand how peoples in a different era viewed their world.
- Learn to make explicit the assumptions that underlie historical texts.

Joseph Wright of Derby, *An Experiment on a Bird in an Air Pump* (Exhibited 1768)

*This painting is an example of the popular interest in science during the Enlightenment*

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1. Imagine that you were going to write an essay comparing the vision of the human situation in Sir Francis Bacon’s *Novum Organum* with that implicit in the Apocalyptic beliefs that we have been studying.

   A. Enter a brief passage from the selections by Bacon in the reader that is a good example of the ways in which his views diverge from those captured in the Apocalyptic tradition.

   

   B. Briefly explain how this passage demonstrates these differences.

   

2. Imagine that you were writing an essay contrasting Ovid’s view of human fate with that of Edward Gibbon. Find a passage from the selections from *The Decline and Fall of the Roman Empire* in the reader that would be a good example of this difference.

   A. Enter the quotation

   

   B. Briefly explain how this quotation would serve to demonstrate the differences between Gibbon’s view that of the human condition and those of Ovid.

   

3. Summarize in a few words what Condorcet thinks the future is going to be like.

   

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[Handout 2](#)

**Step 4 Practice: An Example of an Opportunity for Student Practice in History**
Outcomes Assessment Procedure (Middendorf, 2010)

Overall Steps
1. Write learning objectives that connect to curriculum.
2. Develop an assessment question.
3. Plan several outcomes assessments.
4. Analyze data.

Outcomes Assessment Procedures and Example
1a. WRITE: What do you want your students to be able to DO by the end of the course? The definition of these operations provides criteria for assessment, so the answer is important.
1b. Select a relevant objective from curriculum (if provided).
E.g.: “Knowledge of cultural, intellectual, & historical contexts thru which literary, visual, musical, & dramatic expressions & artifacts are interpreted,” is the provided objective.
1c. Write or select an objective for your course that matches the objectives provided.
E.g.: (Objective written for a literature course on the graphic novel *) “What cultural work does the graphic novel do and how does it do this?” (Peters-Golden, 2010, p. 1).
[Note—the verbs used can make better objectives; see Bloom’s taxonomy.]

2. Develop assessment question: How will I recognize the change in students on this objective? E.g. What cultural work does the graphic novel do and how does it do this?

3. Gather assessment data that will provide evidence of student change on this objective from beginning to end of the semester/lesson. Pre-test/Post-test questions work well. See Hake Item # 43: [http://www.physics.indiana.edu/~hake/]. Try to collect more than one kind of data.
E.g. A: In this course, the question will be included as part of an autobiography assignment at the start of the course. She will ask this question separately at the end of the course.
E.g. B: Embed this assessment question in an assignment. Students have to write point/counterpoint letters arguing in each one for or against graphic novels.
E.g. C: Analytic papers: Students have to write an analytic paper, making an assertion about graphic novel and supporting it with evidence. How well do are they able to analyze the representation of one theme (gender roles, sexuality, queerness, violence, class, race, etc.) in one graphic novel of their choice. Will need a rubric to answer the assessment question.

Assessment of Problem Solving Skills in an Intro Chemistry Course
By Jill Robinson (Indiana University, Bloomington)

Problem: After exams students complain, “The exam was nothing like the practice problems.” That is because they focus on memorization rather than understanding. The aim of this lesson is it to improve problem solving skills by writing out a plan in words.

Two Assessments: After I modeled the 5 step process with particular emphasis on writing a plan for an example problem, they were given a similar problem and asked to write out a plan in words. They were not asked to solve the problem, simply to write a plan. After the first data collection, problem solving through writing the plan was emphasized in the next 3-4 classes and a new multi-step problem was assigned.

Results. There was a large increase from the first to last lesson in the number of students who could successfully write a plan for a chemistry problem in words. 70% of students could translate the chemistry problem into something they understood and develop an approach for solving it. The process of writing a plan in words was concluded to be effective in helping students to solve a multi-step chemistry problem successfully, because 81% of the responses in the “Words” category were correct.

As a result of the first assessment, during the next class period I pointed out pitfalls and misconceptions that were commonly occurring. Through further lessons and practice over the course of several lectures, the number of students who could effectively write a plan and solve a multi-step chemistry problem correctly increased dramatically.
Student example #3: High Mastery
• Not very proficient drawing
• 30 items
• 4 character items
• 4 social status items
• 4 social role items
• Aware of importance of social relationships—adoption, allegiance, also the gift economy

Summary of Assessment Outcome:

- Word-oriented students worked from lists (perfectly ok)
- Many students worked with first half of text only (points to reading issues)
- Average number of items was 12
- 4 items (roughly) related to plot elements
- 2 items related to physical prowess (a generic quality)
- 1 item dealt with role (not enough to capture distinctive features of Anglo-Saxon society)
- 2 with character (not enough to capture distinctive features of Anglo-Saxon society)
References:


Links

American Association of Colleges and Universities Value Rubrics <http://www.aacu.org/value/index.cfm> (If your institution is a member, you can access these rubrics.)

Carl Weiman Science Education Initiative <http://www.cwsei.ubc.ca/>


Freshman Learning Project <http://www.indiana.edu/~teaching/communities/flpindex.shtml>

History Learning Project: <http://www.iub.edu/~hlp/>

Lesson Study Project <http://www.uwlax.edu/sotl/lsp/>