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Elon University General Studies Faculty

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Decoding the Disciplines: Bridging the Needs of First Year Students and Faculty

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Viewing my own interview I was struck by the fact that it sounded so new and fresh to me. Obviously the ideas must have been in my head all along. I must be using this stuff with my students, but I was not conscious of it. It is clear to me now that a skillful probing interviewer can help the interviewee articulate thoughts and ideas from deep down in the subconscious.

--Gregor Novak, author of Just-in-Time Teaching

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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?
Handout 2

Homework Assignment

What is your bottleneck?

1. Identify a specific moment in your course in which your students face a learning bottleneck (i.e. something that is essential for their success but which semester after semester large numbers of students fail to grasp).

2. Describe as precisely as you can what they are getting wrong. (What is the nature of the bottleneck?)

Here are examples of productive and unproductive ways to approach the assignment:

1. **English**
   
   Vague: Students cannot interpret texts.
   
   Useful: "Students in literature classes have a particular problem in the basic approach to textual interpretation. Students forever want to go directly to interpreting a text without first getting a good grasp of a text's content. They need to observe before they interpret, but they are constantly skipping a thoughtful observation stage. Skipping this stage leads to poor interpretations." (This observation is specific enough and provides enough information that it can serve as a starting place for the analysis of the bottleneck.)
   
   Gutjahr, 2004

2. **Biology**
   
   Vague: Students have difficulty moving from fact learning to a deeper understanding of biological processes
   
   Useful: Students have difficulty visualizing chromosomes, appreciating the distinction between similar and identical chromosomes (i.e., homologs and sister chromatids), and predicting their segregation patterns during mitosis and meiosis.
   
   Strome, 2004

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________________________________________________________________________
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________________________________________________________________________
Bottlenecks across the Disciplines

[Note that what may be a perfectly effective in one discipline, may become a bottleneck if it is transferred unthinkingly to another.]

**Humanities and Fine Arts**
Students in a language class struggle to understand, because they don’t observe patterns of word endings and articles.

**Business Technology/Computer and Information Technology**
Students dive right into solving a problem without first carefully reading and thinking about how they will go about solving the problem.

In introductory programming courses, novice programmers have a difficult time understanding the concept of repetition/looping of instructions (how to start, continue, and stop).

**Physics**
The students need to be able to take forces that do not lie on the xy plane and break them up into their x and y components.

**Chemistry**
Students do not grasp the formative mechanisms of acids and bases, and the similarities/differences between them. They are making incorrectly charged molecules.

Students are intimidated by a problem with more than one math step. It is not the chemical principles that are confusing them but the mathematical manipulation required.

**English**
The conflict or paradox of students asking for “freedom” when given a writing assignment and yet also wanting to know precisely what they “need” or “must” do to be successful.

**Nursing**
Students can analyze fluid shifts related to osmolality of solutions and of osmosis, but do not easily recall that hyponatremia causes cells to swell / lyse and hypernatremia causes cells to shrink or crenate.

**Economics**
Stereotypes from the everyday life interfere with learning about price and quantity relationship in firms and consumer-decision making processes.

**Accountancy**
There seems to be a disconnect in the students' minds between the mechanics of bond pricing and the underlying business activity of raising capital by borrowing money and eventually paying it back.

--Thanks to Miami University of Ohio Professors for these examples
Handout 4

What Does a Student Have to Do to Write an Essay in Gender Studies?

The Question:
Today, many people in the United States use the word “feminism” as if it describes a single worldview or political program that has remained more or less unchanged over time. As we’ve seen this semester, the term “feminism” is actually something of a generalization that encompasses a broad range of historically contingent and sometimes conflicting worldviews and political programs. What are some of the specific forms that feminism has taken over the past two centuries? How have feminist agendas changed in response to specific historical events, like the passage of the 19th Amendment? Which people or texts have played important roles in catalyzing the emergence of new forms of feminist consciousness at particular moments? You need not answer all of these questions, but you should consider them as you generate a coherent response that maps some of the different feminisms that have come into being during the period covered in this course and situates the examples you choose to present relative to broader historical changes in US and society and culture.

Unspoken: Know when and how to deploy all of these skills and concepts
Handout 5

Decoding the Disciplines Interview: What does the expert do?

I. Guidelines for the Interviewee:

Pick a specific example of a bottleneck where students get stuck. This can be a specific moment in a course where students get lost, or it can consist of a specific exam question/assignment that students should succeed at to do well in your course, but large numbers fail. (Pick something that really bothers you.) We are going to ask you questions about how you address the bottleneck and what intellectual moves you make. It is your intellectual process, not the content of your teaching that we are trying to get at.

II. Guidelines for the Interviewers:

Opener
Start by having the interviewee explain the bottleneck. Then ask what the expert does so that he or she does not get caught in the bottleneck.

What questions do we ask?
There is one basic question to ask, and all others are variations: “How do you do that?” Then imagine yourself doing what they say. Can you do it? What needs to be clarified?

Getting the Interviewee Unstuck
When the interviewee is unable to unpack what s/he does intellectually, she will say such things as, “I don’t know,” “I’m not sure,” “That’s a good question,” or “What do we do?” They may repeat your question or there may be a long pause.

- Do not get caught up in the content, but stay focused on what the expert does. You want to be able to describe the intellectual process of the speaker. Do not concern yourself with how the students should be taught.
- The key move is to repeat what the expert has told you and probe further. Tell them what you know so far. For example, “So far, I have to read this article. But I have to read it with a special view. How would I do that?”

Another sign that the interviewee is stuck is when they launch into a lecture, telling their content, rather than their intellectual process. In a variation of this they will produce the kinds of language, often highly technical or jargon-laden, that they use to represent complex processes to colleagues who already understand them. Interviewers from other disciplines may feel lost or overwhelmed. Again, we are not interested in their content. In this situation gently interrupt their discourse, and try to get them to refocus at a higher level. Interviewers might ask the expert to go back to describing what kind of thinking this is. Or interviewers might try to explain what they know how to do so far. In an interview with a communications professor who analyzes texts involving co-dependence, the interviewers described what they knew. “So far, you have told us that you study dialogue transcriptions and make connections between the texts. Are there key words or phrases we should be looking for? How do you know what to pay attention to in the text?”
Handout 6

**Biology Lab Report Grading Rubric**

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<th>Score</th>
<th>Qualities</th>
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<tbody>
<tr>
<td>Background</td>
<td>2</td>
<td>- Identifies objectives of study (what did you want to study?)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Provides rationale for study (why is this research important to do?)</td>
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<td>1</td>
<td>- One missing or incomplete item from 2 above</td>
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<td>- Two missing or incomplete items from 2 above</td>
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<tr>
<td>Methods</td>
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<td>- Summarizes protocols used to conduct study</td>
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<td>- Reader can picture experimental design based on brief description</td>
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<tr>
<td>Results</td>
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<td>- Summarize major findings of study</td>
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<td>- Make connections among various treatments or variables using appropriate connecting words</td>
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<td>General writing</td>
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Total score: _______________
"Decoding the Disciplines" Workshop, Wisconsin Faculty College
Joan Middendorf & Leah Shopkow, June 2-4, 2010

Handout 7

Draft Argument Tree (or Map)

1) Evaluating the question. What is the question asking me? Asking questions about the question:
   Understand the question. Why was it assigned?
   What is it really asking? Purpose? Broad questions about the questions?
   What are the possible time frames and limits could I use?
   Geographic coverage? Who is involved?

Know what kinds of arguments historians make

How do these questions relate to my question(s) (the ones that interest me)?

What is (are) the question(s)?

What is my driving question?

How can I turn a "little" question into a "big" one?

What kinds of questions do historians ask?

Do I think I already have an answer? How can I test my answer to see whether it works?

Temptative questions historians ask on exams or for papers:
Statement or quotation: do you agree or disagree?
What are the major reasons for _______ (e.g., English Civil War)?
Write a paper on _______ (e.g., the history of marriage in America).
(Possible topics include divorce, cohabitation, arranged marriages, domestic violence, etc.)
Argue whether _______ (e.g., America) is a true _______ (eg., democracy).
Argue that _______ (e.g., the history of colonialism) is not just the story of ____ (e.g., black vs. white in South Africa).
Pick three examples of _______ (e.g., colonization) and compare.
How and why do _______ (e.g., Egyptian burial customs) change over time?
Convoluted long paragraph with multiple questions, quotation(s), five possible positions, etc.

On to step 2
References:


Links  
American Association of Colleges and Universities Value Rubrics [http://www.aacu.org/value/index.cfm](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/](http://www.cwsei.ubc.ca/)  
History Learning Project: [http://www.iub.edu/~hlp/](http://www.iub.edu/~hlp/)  
Lesson Study Project [http://www.uwlax.edu/sotl/lsp/](http://www.uwlax.edu/sotl/lsp/)