What's Your Bottleneck?

- Identify a specific point in your course where students face a "learning bottleneck "– a critical question which, semester after semester, large numbers of students fail to understand.

- Pinpoint what students get wrong by describing the nature of the bottleneck.

Here are two examples of productive and unproductive ways to approach this task:

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

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

Your Bottleneck

Source: "Decoding Zombie Content and Methods" presentation by Leslie Ortquist-Ahrens, Shaun Longstreet & Joan Middendorf at the POD Conference, Pittsburgh, PA, Nov 2013

SEVEN STEPS TO OVERCOMING BOTTLENECKS IN THE CLASSROOM

Step 1. What Is a Bottleneck to Learning in this Class?
Identify a place in the course where many students encounter obstacles (bottlenecks) to mastering the material.

Step 2. How does an expert do these things?
Explore in depth the steps that an expert in the field would go through to accomplish the tasks identified as a bottleneck.

Step 3. How can these tasks be explicitly modeled?
Show the students the steps that an expert would complete to accomplish these tasks.

Step 4. How will students practice these skills and get feedback?
Construct assignments, team activities, and other learning exercises that allow students to do each of the basic tasks defined above and get feedback on their mastery of that skill.

Step 5. What will motivate the students?
Consider principles of student motivation that will enhance the learning environment.

Step 6. How well are students mastering these learning tasks?
Create forms of assessment that provide specific information about the extent of student mastery of the particular learning tasks defined in Step 2. Are there other bottlenecks?

Step 7. How can the resulting knowledge about learning be shared?
Faculty who have gone through the first six steps share what they have learned informally with colleagues or more formally in SOTL articles and presentations.

Middendorf, J. & Pace, D. (summer 2004). Decoding the Disciplines: A Model for Helping Students Learn Disciplinary Ways of Thinking. Retrieved from http://www.iub.edu/~hlp/articles/middendorf_pace_2004__dtd_a_model_for_helping_students_learn_disciplinary_ways_of_thinking.pdf