Leading Effective Discussion Sections in Science Labs

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This hour

- What is the purpose of a discussion section?

- What are your goals for this session?
Overview

- Working with your professor and students
- What about learning?
- Motivation and Participation
- Preparing for class/lab
- Discussion Starters
- Problems and Cases
- Peer Learning

Ask Questions!
Working with ...

- Your professor
  - Agree on goals
  - Give yourself time

- Your students
  - Be professional
  - TAing is unique
What about learning?

- Knowledge is constructed, not received
- Mental models change slowly
- Questions are crucial
- Caring is crucial

* From *What the Best College Teachers Do* by Ken Bain. (Harvard Univ. Press 2004)
Motivation and Participation

- What keeps students from participating?
- What can reduce fear?
- Ask general questions with no wrong answer
- Small writing assignment
- Bring one question to class
Preparing

1. What should my students be able to do as a result of their learning?
2. How can I best help and encourage them to develop those abilities and the habits to use them?
3. How can my students and I best understand the nature, quality, and progress of their learning?
4. How can I evaluate my efforts to foster that learning?

* From What the Best College Teachers Do by Ken Bain. (Harvard Univ. Press 2004)
Discussion Starters

- Problem Posting
- Common Experience
- Controversy
- Problem or case
- Subproblems
  - Problem clarification
  - What do we know?
  - Desirable solution characteristics
  - Possible solutions
  - Evaluation

* From Teaching Tips, by Wilbert J. McKeachie and Marilla Svinicki. (Houghton Mifflin 2006)
Discussion Starters: Questions

- Factual
- Application and interpretation
  ✔ “How does the idea that _____ apply to _____?”
  ❌ “What is the definition of _____?”
- Problem
- Connective and causal
- Comparative
- Evaluative
- Critical

* From Teaching Tips, by Wilbert J. McKeachie and Marilla Svinicki. (Houghton Mifflin 2006)
Problems and Cases

- Realistic, relevant problems motivate students
  (See “Steps in the Guided Design Process” by Dr. Charles E. Wales in Teaching Tips)
- Cases provide contextualized learning
  - May involve several alternative approaches
  - May require evaluation of solution values and costs
- Choose initial cases with clear differences
- Help students move from particular to general
- Games or simulations
  - Specify teaching objectives served
  - Highlight game features that contribute

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Peer Learning

- Have students discuss what contributes to group effectiveness
- Make sure students know what their task is
- Move around and listen to groups
- Strategies
  - Learning Cell
    - Pairs alternate asking/answering questions on common material
    - Alternately, A “teaches” B essentials and then asks B prepared questions, followed by role reversal.
  - Think-Pair-Share
  - Syndicate: Student groups discuss together and make reports to class
  - Jigsaw: members of each group agree how to prepare material, and are shuffled so that one representative from each group is in a new group to teach their material

*From Teaching Tips, by Wilbert J. McKeachie and Marilla Svinicki. (Houghton Mifflin 2006)*
Resources

- **What the Best College Teachers Do** by Ken Bain. (Harvard Univ. Press 2004)
- UMass Center for Teaching [http://umass.edu/cft](http://umass.edu/cft)