

Teaching by Questioning



Learning Objectives

After this workshop you will be able to :

- Appreciate that understanding students' thinking is necessary in order to address their conceptual difficulties
- Recognize how TA questions can positively impact student learning
- Describe several types of useful questions
- Apply this knowledge to generate questions for a specific teaching circumstance



Module Overview

- The Tutorial Environment
- Introduction to teaching by Questioning
- Analysis of TA Transcripts
- A bit of a breather
- Summary of Questioning Techniques
- Practice Exercise



The Tutorial Environment:

Green Group Tutorial

- These students are discussing the following question:
 - *Which, if either, has more acceleration: a car cruising steadily at 60 mph or a rocket drifting steadily at 6000 mph?*
- As you watch, imagine what you might do if you were their TA.



Green 2-5



Large-Group Discussion:

Green Group Review

- What is your gut response as you watch these students? What would you do if you were standing there?
- Wouldn't it be quicker to just tell them the answer?



Why Not Just Tell Them The Answer?



Moving from Passive to Active

- ❑ To increase student learning we want to shift into an interactive and collaborative mode
- ❑ From Teacher-Centered to Learner-Centered
- ❑ TAs can help by keeping focus on the students and using good Questioning
- ❑ Let's look at an example...

Small-Group Learning Activity:

(6 min)

Blue Group Tutorial

- Read the question that the students are working on (in a box on your worksheet)
- Discuss with your group: what are the main goals of this tutorial?
- Peek ahead to the discussion questions on page 5 and keep them in mind as we watch the video



Blue 5-4

(5 min)

Blue Group Tutorial Analysis

- Take a few minutes to discuss the questions on your worksheet and jot down a few words for each one



Large-Group Discussion:

Blue Group Tutorial Analysis

- ❑ What did the TA do to keep the focus on the students and their reasoning?
- ❑ The TA passed up several obvious opportunities to commend or correct the students. Where do you see this happening? Why do you think he does this?
- ❑ What could he have done better?
- ❑ How do the students seem at the end of the clip?

Small-Group Learning Activity:

(6 min)

Green Group Tutorial II

- Read the question that the students are working on (in a box on your worksheet)
- Discuss briefly with your group: what is the point of this exercise?



Green 2-6

(5 min)

Green Group Analysis

- Take a few minutes to discuss the questions on your worksheet and jot down a few words for each one



Large-Group Discussion:

Green Group Analysis

- It's often a good idea to leave students to discuss an issue on their own. Do you think this was the case here? (line 20) Why or why not?
- Where does this TA succeed at probing the students' reasoning? Where does he fail?
- How is the students' understanding at the end of this interaction? How is their confidence?
- What could he have done better?



Large-Group Discussion:

Green Group Analysis

- What are some key differences in the style of these TAs?



(10 min)

~ Break Time ~

After the break:

- A Taxonomy of Questions
- Questioning Practice



Three Types of Questions

(for answering Questions)

1. Questions of Clarification
 - Where are we?



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 - How did we get here?

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1. Questions of Clarification
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2. Backward – Thinking Questions
 - How did we get here?
3. Forward – Thinking Questions
 - Where are we heading?

The Mystical Fourth Type of Question!

(for answering Questions)

4. Questions to encourage the use of Problem-Solving Methodology
 - Which step of the problem-solving method / lab instructions are you working on?
 - Did you successfully complete the earlier steps?



Small-Group Exercise:

Practice Questioning

- Read the question that the students are working on (in a box on your worksheet)
- Imagine that you are another TA in the room, and watch the following video.
- What questions could we ask to help move these students towards a better understanding?



Orange 3 - 6

Small-Group Exercise:

(5 min)

Practice Questioning

- Review the transcript individually
- Imagine you are given a chance to contribute:
Discuss with your group to think of questions that you could ask
- Try to come up with as many different types of questions as you can



Large-Group Discussion:

Practice Questioning

- What did you come up with?



Key Guidelines for Questioning

- **One** question at a time
 - avoid yes / no
- **Wait** for a response
 - 5 – 10 seconds
- Paraphrase **or** follow-up question



Body Language

- Look at the person or class directly
- Listen attentively
- Be complimentary
 - find and reinforce the logical reasoning behind answers (even the wrong ones)
- Relax :-)

Individual Activity:

(5 min)

Summarizing your Learning

- How can listening help your teaching?
- How does teaching by questioning help students learn?
- What new tips or types of questions did you learn?



Review: Learning Objectives

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Feedback:

On a 3 x 5 index card please write down:

- One thing I should **Stop** doing
(either specific to the workshop or in my general teaching style)

- One thing I should **Start** doing

- One thing I should **Continue** doing.



References

This module was developed with materials from:

- The Maryland Tutorials in Physics Sensemaking, A. Elby, R. Scherr, *et al.*