Why Study [your course]?

Objectives

To generate discussion about the course format, create comfort with small group work, frame the purpose of the course, and generate motivation.

Activity 1: Course Minute Papers

Students complete two "Minute Papers" where they answer the following questions on a piece of scrap paper, and sign it. (If TA resources allow, they will get credit for these Minute Papers at the end of the semester)

- What is Fluid Mechanics?
- Why study it? What applications do you know about or interest you?

The instructor scans the answers during a short break while students are encouraged to meet and exchange contact information with their neighbors. Then the content of the course is discussed, as well as the variety of applications of the course content.

These questions are asked for two reasons:

1. What is your starting point? What ideas do you come in with, what are you most interested in?
2. I want you to think about what you know now.

Leads into discussions of learning:

- Constructivist theory of learning is that you build on what you already know. Learning is not an assembly process that you carry out. The professor only provides some pieces, not all. You incorporate concepts, develop ideas, and store them in accessible ways.
- "Metacognition" is thinking about thinking. Watch yourself learn. What works for you? Be honest with yourself. Does reading what you highlighted in the text really help? Maybe try testing yourself with problems; it might be more efficient.

This is followed with a clicker question (see "clickers" files), "Does knowing fluid mechanics mean…. Getting the right answer or Understanding concepts." (Answered on a continuum from A to E). In discussion to this, she discusses the roles of engineers and how the value of getting the right answer has changed over time.

Effectiveness

No formal studies of effectiveness have been made, but the stage is set for later metacognition activities, and the list of student interests is helpful later in the semester when designing real-world contexts for assignments. The short icebreaker activity seems to be very effective; the energy level in the room rises noticeably, and students willingly engage in pair-share activities for the rest of the semester.

Authors

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Materials & Resources

None

Time Requirement

10 minutes

About this Project

This is one of a set of materials compiled for instructors to draw upon in order to frame non-traditional modes of classroom teaching for their students. Our hope is that these materials can help reduce any student resistance to such techniques.

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Other materials available online at www.colorado.edu/sei/fac-resources

Activity 2: Why are you here?

This is done as the first "small group" activity of the semester. In groups of 3, students are asked to discuss this open-ended question.

The instructor discusses their own view: Physicists take "obvious" questions and dig deeper. So let's do that in this course!

After they've discussed, I tell them that I bet I know the superficial answer: "because I have to." But WHY do they have to? Why does someone in their own major feel this course is important to them? And, why ELSE besides being forced into it.

Students generate lots of nice thoughts here – relevance to real life, personal interest, it's fun, needed for MCATs, useful in science careers, … I also talk about "scientific method" as transferable, about quantitative understanding as being useful for everything from medical diagnosis to tax forms!

Effectiveness

I have done this a few times and it always generates good discussion / noise level in the room. I get a reasonable number of "callouts", (i.e. students volunteering their ideas) in the all-class discussion period afterwards. I don't have data collected on this, but last term in a class of 200, I recall getting ~30-40 hands, and ultimately heard voices of maybe a half dozen students before I decided to move on. Indeed, part of what's happing in that callout session is to point out that I *want* to see more hands and hear their opinions, i.e. to make explicit what the classroom culture of "all-class discussion" should be like!

Activity 3: Using messy thinking in a career

This is for a teacher prepration course. Many students expect the course to simply solidify high school level geometry content. This activity is intended to get students to recognize that there is more than that to the course, and for them to recognize that they need to be interactively engaged in the content (rather than the instructor imposing those goals and methods). Students in the course were resistant to getting information from an authority

I show the students a video of a high school course (I used the first 10 minutes of a high school geometry course at http://www.learner.org/resources/series34.html; #8 about parallelograms; click VoD twice). Note that this is a course for pre-service teachers, so the video was chosen for that audience. For other audiences, a video showing another career path using course content would be appropriate.

I then asked what knowledge, skills, and dispositions the teacher in that video needs in order to be able to teach that content to his/her students. The students in my course were clear that I could not prepare them to respond to the wide variety of thinking exhibited by these high school students, so it would be valuable to interact with the messy thinking of their fellow students, rather than listening to my polished thinking.

Effectiveness

This exercise seemed to be a powerful tool to make sure that all were on the same page that conveying information was not the goal of instruction in the course.