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Tips for Using Questions in Large Classes

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I am frequently asked how I get students to loosen up, to feel comfortable asking questions and to take an active role in the learning process, especially when teaching large classes. I teach an introductory biology course with an enrollment of about 300. The students feel a safe anonymity amid their classmates, and there is a tendency toward reduced participation. Through trial and error, I have learned some helpful techniques for engaging the class. Amazingly, much of what I do all happens on the first day of class.

Setting the tone seems to be critical. In a general sense, I find that students will accept almost any rules for how I run a class, as long as I make them clear at the outset and am consistent in their application. This includes how I want the class to interact with me as an instructor. I have become a strong proponent of cooperative learning. I want the students to be an active part of the class, to be thinking while they are sitting there and not simply writing down every word I say.

On the very first day I make it clear that I want them to ask questions and interact with me during lecture. I do this in five ways. First, I tell the students that I welcome questions. I explain that if they have a question, in a class of this size, it is likely that a dozen other students have the same question. I proceed to relate an anecdote from when I took Japanese in college. The instructor said, "To ask a question is a shame of a lifetime. To not ask a question is a shame of generations." The instructor explained that while it might be embarrassing to ask a question, by not asking a question, you pass along your ignorance to your children and so on down the line.

Second, I make the entire class literally raise their hands. I ask them to humor me for a few seconds and to just raise their hands—first the right half of the room, then the left half, then the middle. They will actually do this if asked. I point out that they are clearly capable of raising their hands and that I want them to do so if they have any questions. Perhaps they are willing to raise their hands on the first day because they are doing it as a group and not individually. When I was a teaching assistant, the instructor told the class to hiss if they did not understand. It worked. The students found it easy to hiss because they did not have to specifically identify themselves. It is also hard to ignore a group of students who are hissing at you. I opt for a slightly different approach and ask

students to yell “stop.” I tell students that with this many people, I might miss a raised hand, but I will hear a shouted “stop.” Amusingly, I have on numerous occasions heard a student yell “stop” only to look up and see him or her pointing at someone else whose raised hand I had missed.

Third, I get the students to interact that very first day. I give an example of science that comes from their everyday lives and then ask for feedback. I very briefly discuss water hardness—an appropriate topic for the area where we live and ask them to guess where our water falls on the hardness scale. There is no obvious right or wrong answer, so there is no harm in guessing.

Fourth, I coax the questions. If I think there is some confusion but I am not sure exactly why, I might ask a series of questions: “Are there any questions?” None. “So you all understand the properties of carbohydrates?” Still nothing. “That means if I were to ask you on the midterm whether a carbohydrate would be more soluble in oil or water, you would know how to answer?” This usually elicits a response—several, in fact. Why go to this length to get a question? In my experience, the questions usually exist. Hearing them give me a better sense of what might the students have misunderstood, or more likely, what might I have explained poorly?

I want to add a fifth point. To me, it is not only important to get the students to ask questions, but it is also critical how I phrase my own questions. I used to ask, “Where does our water fall on the hardness scale?” I would seldom get more than one or two very quiet responses. The problem was that I was asking an individual to come up with a specific numerical answer and to commit themselves to that answer in front of the entire class. Now I ask for a show of hands and I rephrase my query into several questions, “Raise your hands if you think our water has a hardness of less than two. Raise your hands if you think it is between two and six, etc.” This generates a huge response. This approach turns the large class into an advantage, because, if you raise your hand, you are just one of many who are raising their hands at the same time. In a small class, you cannot count on any other hands going up. Why bother getting everyone to raise a hand? In my opinion, the very act of having to decide when to do so has drawn students into the discussion.