

**CATHERINE
DRENNAN:**

We started using these clicker devices in 511.1, and clickers are these small credit card sized devices where I can put a question up on my computer that the students will see, and it will have three, four, or five choices. And the students can look at the question and click in what they think the answer is.

And this was a big trend, I think, in education for big classrooms because it allows the students to engage more. The teacher, who's standing in the front of the room with 300 people, they're not necessarily going to raise their hand and go, I'm confused, because it's a big class. But if I ask them a question to see if they're confused, they'll click in. I'll go, oh yeah, that did not go the way I wanted. Clearly people are confused. Let's talk about this some more. Or 95% get it right, and it's like, OK, I can move on and go on to the next thing. So it's a great, I think, teaching tool.

Everyone should be clicking in to the clicker question. So does someone want to explain why this is the correct answer?

But when we first brought them in, the students were not so excited by them. And there were other classes at MIT that were using them, but it was like, OK, we'll do this. But I didn't get that there was a lot of enthusiasm for them. So I tried to think about ways that we could make it more fun.

And so one thing that I thought is that we could have some competition. And in 511.1, there are multiple recitations that are run by a graduate student TA, so everyone in the class would have their recitation group of 20 people. And so I thought, well, on Friday in class, we'll have a little competition and we'll see which recitation gets the most clicker questions right. And they will get a reward, which is maybe some donuts at recitation next week. Something small. Some kind of food.

And largely, it was bragging rights. Our recitation got the most questions right. So we started doing this, and then I surveyed the students both before we had done the competitions and after to kind of look at whether the students liked the competitions and felt like they were learning. And I found a really big difference. So students had always said, yes, I try to answer the questions correctly.

But then when we asked them questions about how hard they wanted to work to understand

chemistry and their real desire to learn and the impact of the course, that with the competitions, all of these things were much higher. And so it just seemed like they were more engaged. There was more of a buy in, and I would talk to some of these students. And they were like, oh yeah, I'm in Jay's recitation. And they felt a part of something. They had ownership.

And a lot of the groups in the recitation, they would start studying together. Even though they didn't know each other before and this is often freshman year, so these might be some of the first people they're meeting in their classes. They got very serious about the competition some years, so they would meet the night before class to review some things so they were ready for the competition.

And I've seen students who've been doing this for a number of years in their junior year, and they're like, oh yeah, I get together with my friends from the clicker competition every month or so. We go have dinner or do something fun. So they're making friends for life. And so I think that this is just in a big 300 person class, feeling like you belong, you're an active participant rather than a passive one. These clicker competitions built this sense of team.