

JANET RANKIN: Well, active learning is the idea that students, to really learn something, to really understand something have to be actively involved and that just sitting passively and listening to a lecture really doesn't help students develop the higher order cognitive processes that they need to really, really understand something. So you can listen to something, you can watch a movie, you can watch TV, and you can generally get the plot. But if you're asked to recall specific details or to even explain a particular nuance associated with the TV show or movie, you can't really do it. And that's what happens often in a lecture, is that students will sit in the lecture, they'll write down what's being said, but they're not really engaged with the material.

So active learning is this idea of, people say minds on, always hands on sometimes. So students have to be actively with their mind thinking about the material, applying what's being said, and given opportunities within the lecture to apply what's being taught or the topic at hand. And then active learning, strictly speaking means that just one particular individual is active. Interactive, we tend to parse that a little bit and say interactive learning would mean the student has been active in his or her own mind in thinking about the material, but then is also interacting with others, peers or potentially the faculty member or TA in order to further develop understanding, construct meaning for the topic.

I always start maybe the second session of the class. The second class meeting is a discussion of what we know about how people learn. So a discussion of the literature and the research on human cognition and learning.

And if you take a constructivist point of view or a constructionist point of view, which really says that as I said before, to understand, people have to make meaning of a topic, they have to construct their own meaning. And we show the research that really shows that this is true. For higher level cognitive processes, people have to be actively engaged. And there's research to show that.

We also show the classroom-based research, so [Freeman's ?] 2014 paper that was a meta-analysis of this 225 other studies that showed that in courses, in college-level courses where active learning was used, there was a 12% decrease in the failure rate. And they normalized it to all of the important factors that they should be normalized to-- the experience of the instructor, the size of the class, the type of the institution, the position that the class is situated within the larger curriculum. And across the board it was shown that there was a 12%

decrease on average of the failure rate.

And they make a comment in the paper that if that had been a clinical trial of a drug and 12% of the people on the drug had [? shown ?] marked improvement, they would have had to stop the trial and give everyone the drug. So this idea that there's a 12% decrease in the failure rate in courses that use active learning, to me is pretty compelling that we should all be using active learning. So whenever possible, because our students are MIT students, we use data, we use the research, and we try to find really good research, solid research that shows the way people learn and then how to support that with specific classroom practices.

So many of the students haven't had the experience of being in a class where active learning was used, so they don't really understand it. So when we start to talk about it as a way of teaching, they may not really get it. So throughout the course, from the first class all the way through, I try to use several different types of active learning exercises each class. So the students themselves are actively engaged with the material from the first day.

So I may have them break into pairs and discuss a particular topic or identify something they didn't understand from the pre-class readings. And then after three minutes, they can either share their comments with someone else or maybe we just report out to the larger group. If they just report, if they just write down and then report back, that's a pretty good example of active learning. It's pretty simple, it's what you might call low-hanging fruit in terms of what it takes for a faculty member to do that. So I'll do that, I'll have them do that.

And then I step back and say, OK, why did I ask you to think about it? Why did I ask you to take three minutes before we had this discussion? So I try to deconstruct the exercise for them, showing them the advantages for the learner.