VIDEO TRANSCRIPT: VIDEO OF DAWN TAMARKIN

Hi I'm Dawn Tamarkin, and I am a Professor in Biology at Springfield Technical Community College.

I was asked to incorporate Universal Design for Learning or UDL, into my introductory biology classroom. That would be for both the lecture portion of my class and for the lab portion. I've incorporated a lot of other strategies into my class, whether they're teaching or learning strategies over the years.

But UDL was a bit different for me. UDL was something that I had concrete ways to come up with ideas, and then the ideas that I came up with really worked for everyone. So, for example, in Lab, I had to consider what somebody with a disability might not be able to do. So, whether it was a visual disability, or learning disability, or physical, like a motor disability, or an auditory disability, what could they do and not do in Lab.

Once I thought about that there were certain tasks that I knew that students in introductory biology could not do. One of those tasks was to use a microscope. We have all of students use microscopes to look at cells, and I had a student who was visually impaired, and she couldn't do it. So I had to figure out exactly what it was that I wanted students to learn, what it was that I wanted them to accomplish when they used the microscope.

In fact, for me, it helped a lot because I knew I wanted students to look at cells, I knew I wanted students to understand what a microscope was. But I hadn't really gotten all the goals for learning down quite as precisely as I could have. And as I thought about what this visually impaired student would need to take away, to have learned exactly what all the other students learned, it made me define my goals better, and I was able to come up with another strategy for helping her to learn.

Like all Universal Design for Learning Strategies, by helping her learn I was helping other people in the class learn too. So I'm going to show you the design I came up with for her, and something that I'm still using in all my classes. I came up with a notion of dynamic cell models where students can take components of a cell and put them together on a lab bench as they're looking at a cell in a microscope.

So for example, if a student is looking at an onion cell they would take a membrane and act like a Cytoskeleton and bend it into the right shape for the cell that they were looking at under the microscope at that time. And then they'd put a cell wall around the membrane, and any organelles that they saw inside the cell they could then put in as well.

So in an onion cell, they would also see a nucleus. For someone who is visually impaired, once my students put this together, that student can feel around, and they can tell that there's this thick cell wall outside of a thinner membrane, that there's nucleus with a double membrane and some chromatin inside.

Now if this is not an onion cell but instead it's a cheek cell, there's no cell wall because animal cells don't have it and students can bend this the right way, and put the nucleus in, maybe even show that they've kind of bend the cell a little sticking out on the slide. And even have some bacteria that might be stuck on the outside of the cell.

My students who enter the class without disabilities end up working in teams to be able to create models that represent the cell that they're looking at in the microscope. They end up getting a 3-D, more of a spatial awareness of the cell. In fact, sometimes a student will stick a bacteria inside the cell and when I tell them that there's something wrong with their model, another student will say "Wait a minute, that's not a cell inside of a cell, it's on top of a cell." and they all get the idea so much better about what they're looking at.

I have many other organelles that I made -- I'm hoping eventually to make some of these in plastic so that not everyone has to make them. But they are all tactile, like the chloroplasts with inner and outer membranes. And so they have some kind of information for someone who has a visual disability.

But at the same time once a student works with their lab partners and team members to create what the cell they're looking like in the microscope looks like on the table in these models, they can look at many other cell types in the microscope and they instantly know what's a cell, what's a pile of cells, what's inside a cell versus the whole cell. It makes a whole lot of sense to them. Modeling the first one is difficult because they don't know if one cell is the cell or if 20 cells are a cell or if just the nucleus alone is a cell. But they get it once they start using the models.

So it's an example of something that I designed specifically for a student with a particular disability. And yet have found that every student who uses it has benefitted. It doesn't take extra time in my classroom because all the cells they look at after they model the first couple, they can see them all much better and much faster.

There are some other designs that I did as well in the lab and in the lecture. They all have that same element; they all started off with my figuring out what a student with a disability could not do. Trying to re-evaluate what it was that I hope to have my students achieve from that particular task. And come up with an alternative way of presenting that same information for the student with a disability which then all my students can use and they can benefit from.

The Universal Design for Learning methods tend to be more interactive, more hands-on and in this case, rather kinesthetic in spatial so it's helpful for many students. Biology is a topic that students who have no interest in science can often find very difficult to conceptualize; so breaking down some of the items into a clear conceptual set of ideas, to a clearer strategy, makes it so much easier for them to all understand and UDL helps me to do that.