

## Lessons from the classroom – response to presentation Dr. Briana Pobiner

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Briana Pobiner: 00:19 Hi, I'm Brianna Pobiner and I'm a member of staff here at the Natural History Museum. I work in the Human Origins Program as a research scientist and an educator, so I'm going to be putting on my educator hat. And I know Connie asked me to talk about my work in Informal Science Education, but I do want to start, because this has mostly been about Formal Science Education talking about some research that I've done and I'm doing in that realm. (00:44) Last year, almost a year and a half ago finished up a project that was funded by the National Science Foundation called Teaching Evolution Through Human Examples. And what we did in that project working with Advanced Placement Biology high school students, we were interested in the effects of two different things that we created for the classroom. (01:05) One was a set of teaching resources that used human case studies or human examples to teach about evolution. And so as Jamie presented human evolution can be a real stumbling block, but the hypothesis of our project was that potentially human evolution is actually the window that you can open through which students can walk to learn about evolution, because it's all about people and it's then students are really interested in themselves, particularly high school students. (01:34) So we created some materials around, mostly around natural selection in modern humans, as well as around the relationship between humans to other organisms. And then the second resource that we created which Connie led the development of is called Our Cultural and Religious Sensitivity or CRS teaching strategies resource. (01:56) And a classroom activity that we did that sounds similar in some ways to what Jamie's done and also to what the study that was published in 2017 in the American Biology Teacher, that Jamie mentioned. One of the activities that comes out of that CRS resource that is done before introducing the topic of evolution and the content focuses

on the nature of science. What are scientific questions? What are other ways of knowing the world, including religious understandings of the world? And then presenting a series of statements by different religious organizations, educational organizations, individuals about different ways that science and religion can interact. (02:44) And the students classify those statements into either conflict or separation or interaction. And for a lot of the students, and we field tested this in 13 or 14 States across the US. For a lot of the students, it was their first, really their first exposure to this variety of ways that religion and science can interact. And there was a real sense of relief among the students that maybe they could find a way for students that have only heard about the conflict mode of interaction of science and religion, that there are other things out there. (03:21) We use some published measures of understanding evolution and accepting evolution as has been brought up before, these are two different things. And interestingly, we found that in the classrooms where the CRS activity was done before the introduction of the topic of evolution, we saw a greater increase in understanding of evolution in those classrooms. (03:47) So it does seem that bringing this up, talking about it, it only took one class period, really let the students breathe a sigh of relief. We had one of our field test teachers in Virginia gave the measure that we were using on attitudes towards our acceptance of evolution to her students before the school year started. And she said, "No, I think my students are fine, we don't have a problem with acceptance." And then when she actually looked at the data, she said, "Oh, some of my students actually have real trouble with evolution." (04:20) So we have found that bringing up the topic, being able to talk about it, but then focusing on the science content and evolution in the classroom seems to be a real path to success. So, what else did I want to mention? Yes. And so, thank you. So Lee's going Luda under his breath. And so that the next phase of the project is what we're calling Luda, Learning Unity and Diversity in Alabama. (04:49) And so NSF was pretty pleased with our results. They've given us funding for a five-year project in which we're taking the teaching material that we created for AP biology, which you can argue those students have had biology before, they had

pretty high understanding rates, acceptance rates. We're revamping those for ninth grade or 10th grade introductory biology, creating an entire unit that will teach the concepts dealing with evolution. (05:15) One focused on human examples, one focused on non-human examples. We're going to see how those work relative to each other. We're going to revamp the CRS resource of that particular activity and scale it and have some good reading strategies for the ninth graders, definitely different from 11th and 12th graders. And we're doing all of this work in Alabama.

Lee Meadows: 05:41

She said, "Alabama." Got it?

Briana Pobiner: 05:43

I said Alabama, not in small part because I've made such a wonderful connection with Lee who has a trusted network of teachers in Alabama, who he's been working with for more than 20 years. But because in 2015, Alabama adopted new state science standards that use the word evolution for the first time. And so our argument was that teachers who may have either grown up in Alabama, not learned about evolution, don't feel comfortable with it, are teaching in communities where it may be difficult to teach about evolution. (06:22) So our argument is that we will create high quality field tested resources by a trusted institution coming out of this Smithsonian that we can demonstrate will engage students in learning evolution and hopefully increase their understanding, potentially increase their acceptance of evolution. So we started the project a little less than a year ago, we're going to spend a couple of years developing the resources and doing field testing. So maybe in four years or so we'll be back talking about that. So I'm really excited about that project. (06:59) And I also wanted to mention just briefly about, so one of the roles that I play here at the Natural History Museum is that I help manage volunteers in the Hall of Human Origins, at least one of whom is here today. So thank you for coming. And part of what I do is help with not only content training about keeping them updated on the amazingly fast paced science of human evolution, but also on engagement strategies. And so I've done several workshops with our volunteers on how do you engage visitors in the museum around controversial scientific

topics, particularly like evolution and climate change? (07:32) And two of the things that we do, one, somebody asked me about how I do this recently and I say, "It really depends on where the question comes from." Just like it really depends on how the question is worded, which is something that Jamie mentioned, but to really listen to visitors and figure out, because you can have the same question with a variety of tones of voice that are coming from different places. (07:53) And also we do an exercise thinking about what is the hardest and scariest question that you're afraid visitors are going to ask? Let's get those out on the table and practice them. And as a community and have the volunteers come up with answers and share strategies on how to do that unlike having a trusted teacher who you work with for an entire school year, our volunteers may get 30 seconds to talk to visitors about evolution. So we have to have some slightly different strategies about how do you make sure to introduce the topic or talk about the topic in a way that is respectful and non-threatening? So I will stop there, I talk a lot longer.

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