Inclusive Classrooms Transcript

Hi, my name is Sophie Miller. I'm a rising fifth year graduate student in chemical engineering and my pronouns are she/her/hers. I'm excited and honored to be here today to talk to you all about inclusive classrooms.

This is the outline for today's session. I'm going to begin by motivating our discussion of inclusive classrooms and talking about why we should care about this topic. Then I'll talk about reflecting on ourselves and who we are as TAs before going on to talk about 1) who are our students? Then I'll talk about identity and about things called unconscious bias and stereotype threat. I then want to discuss the differences between the following terms of equality versus equity versus equal opportunity. And then I want to give you actual tools in order to help create inclusive learning environments. And I'll discuss transparent teaching and strategies for creating these kinds of classrooms.

My hope is that by the end of the session, you'll be able to recognize and appreciate the values that are brought by diverse backgrounds and experiences, and to recognize unconscious bias and stereotype threat. To be able to understand the differences between equality, equity, and equal opportunity as they manifest themselves in the classroom. And to be empowered to create inclusive courses and class environments for your students.

So why should we care about this - why make inclusive classrooms? Well, research has shown time and time again that diversity makes us smarter. What does this mean? Research has shown that socially diverse groups, meaning diversity of race, ethnicity, gender and or sexual orientation, are more innovative than homogeneous groups. The reason people think this is is that by interacting with others who are different from us, we are forced to be better prepared, we can anticipate alternative viewpoints that others might have, and you go into a conversation expecting that consensus will take effort. I've linked at the bottom a resource on studies like this, but there are several that you can find in the literature.

So diversity is clearly important, it will make our groups more innovative and better. So how are we doing today in STEM? Well, as many of you might know it's not too great. Females, African American or black students, and Hispanic or Latinx students are underrepresented in most STEM fields. And what's interesting is that these groups experience a disproportionate loss in the natural sciences and engineering. When you compare intended degrees amongst freshman in undergraduates and the ultimate degrees that are received by the end of their undergraduate education. So in when you look at what the students want to study, the this disparity isn't as great. So somehow we're losing these students along the way.

So what can we do about this? We as educators can help change this pattern if we create more inclusive classrooms and if we ensure that we provide students with equal opportunities to succeed. And in this talk, I'll talk about how to foster these inclusive classrooms and what does it mean to as a teacher give equal opportunities to our students.

Before you go into the classroom for the first time it's important for you to reflect on yourself, on your own identity, your background and your experiences, and to recognize the limitations of your own perspectives and experiences and how they might shape the assumptions that you might have about students and the way that you approach teaching and learning.

One thing that you can do on the very first day to help lay the foundation for an inclusive and welcoming environment is to introduce yourself to your students with your pronouns like I did. And you can do this in your first recitation. You can write it on the syllabus for your class or if you're learning in person, you would write a perhaps on the board at the first recitation that you hold.

So who are your students? When you start your course you should really make an effort to get to know the students and to learn about their identities. You should be aware of identities and languages around you and how they might be different from your own. One thing I do before I start teaching a class is I look at the roster that I'm giving - you can find on Access or REGIS typically a list of all the faces of your students.

And on the first day of class, I'll ask students for their names, but I actually will have, prior to going to the first class, already made an effort to learn faces to names. And the faster you can learn students names and calling them by their names and know certain aspects of their identities, the much more inclusive and welcoming environment you'll create for the students.

One big theme of this entire talk and a really important message to drive home is that you really should not make assumptions about your students. Any assumptions you might have based on their appearance or the fact that they are students at Caltech, or their majors, or what they should or should not have taken as prerequisites - don't assume anything and really create your courses trying to put as many of these assumptions aside.

This brings us to this concept that's often referred to as the identity iceberg. Just like an iceberg is often much larger than what you would see above the surface of the water, our identities are mostly not really perceivable just by seeing or interacting with us at a surface level. Even some of the things that are shown here as being above the waterline of visibility are things that might not actually be as they appear to you or as you might perceive them. But beyond, below this level or inside of people are so many aspects to their identities that you wouldn't really be able to see on the surface. And the point of this is really that as a teacher, you really should be careful not to say something that might alienate students either based on where they come, from their beliefs, their political views their ways of learning are thinking, and you should consider as many of these as possible and understand that your students are diverse and multifaceted.

By each of us having our own different identities and inherently being different, we all approach things, whether we like it or not with certain unconscious biases. Before we go into what unconscious biases all first just define the idea of a bias. A bias is a prejudice that we have in favor or against certain things groups or people compared with other ones, and it's usually in

a way that's considered to be unfair. These biases are created and reinforced by the environments we're in and the experiences that we have. And we are fundamentally biased to favor people who are more similar to us and biased against those who are different from us. So when we're moving quickly through life, or we lack a full set of data about a situation or person, our unconscious biases often fill in the gaps.

So we don't expect anyone to be an expert or anyone to know everything about someone, but once we realized that we don't know something or that we're lacking complete information, it's our responsibility to learn a little bit more, to do a little bit of research, do that Googling and kind of educate ourselves on our unconscious biases.

So what are some examples of unconscious biases in
academia and in STEM. Well, there are several studies that show how this might manifest itself, but one study showed that for an identical CV, faculty were more likely to hire someone named John than Jennifer. But they thought that Jennifer, despite having the exact same CV as John, was more likable.

In a separate study when evaluators were asked to rate a verbal skills test, they gave lower scores if they were told that an African American wrote the text than if they were told a Caucasian person wrote the same one. Also, they assigned lower ratings to the text when they were told that a man wrote it, then when they were told the woman wrote it.

In yet another study, parents estimated higher math abilities for their own sons than for their daughters, despite no difference in test scores between them. The biases and the unconscious biases we have often manifest themselves through stereotypes as well. Stereotypes are oversimplified ideas about an entire group of people without regard for individual differences between members of that group. And these look like all blank are good at this, all blank are bad at that. And these stereotypes can often lead people to experience something that's known as stereotype threat. And this describes the fear that someone has that their behavior will confirm an existing stereotype of a group with which they identify. So, for example, girls might not do well on a math test and feel that that in reinforces some stereotype that girls are bad at math. Or these other examples of stereotypes or that boys aren't creative, that athletes are dumb, that if you come from a poor neighborhood you'll never succeed. And these are obviously all not true. But if someone is going into a classroom, they might be afraid or feel extra pressure to kind of go against these false stereotypes. These stereotype threats are likely contributing factors to the higher dropout rates of underrepresented minorities in STEM.

If people go into a course being told that they're not as smart or less likely to succeed, they'll be less likely to have the confidence to succeed and the desire to stay in that field. Some examples of stereotype threat in academia or in the sciences that we see is: one is that female students or African American students if asked to identify their race or gender like we are at the beginning of many standardized tests, including the SAT, they will do statistically worse on that exam, then if they weren't asked to identify their gender or race.

In a different example - I'll read this quote from another study - it says that even groups who typically enjoy advantage social status can be made to experience stereotype threat specifically White men perform more poorly on a math test when they're told that their performance will be compared with that of Asian men. And Whites perform more poorly than Blacks on a motor task when it is described to them as measuring their natural athletic ability. So of course, these are based on certain stereotypes of an entire group. But when people are going into a task and are afraid of reinforcing these stereotypes, it'll affect their ability to perform.

So in summary of these ideas and how they're all linked, certain social signals and the environments in which we find ourselves will shape unconscious biases that we have. And these unconscious biases inform certain stereotypes and the stereotypes that are held within society will lead people to experience what's known as stereotype threat.

So how do we address these stereotypes and biases in the classroom? One thing we can do is to be sure that we establish students prior knowledge as they go into a course.

We can do this by not assuming that just because a student is taking your course that they necessarily took the prerequisite just before, or that everyone in the classroom has the same understanding of a certain topic that you might think is necessary for being able to proceed within the course.

It might be useful to assign a little quiz or a small assignment that isn't graded based on the results of it, but just based on participation to see/evaluate what students prior knowledge really is going into the class. Similarly, as you go on through the class, you should reward students for current learning over prior preparation, knowledge, or access to experiences or information, and you should design your assessments, your problem sets, your projects, your exams with this in mind.

As a TA, you should be open to and actively seek out feedback. You should also actively try and change the narrative that's being told. Who are the examples you're choosing of scientists? Are they current? Are they young? Or are they coming from different places and backgrounds? And if they're not, since it's often hard as we look back on the history of science or mathematics or engineering to find such a diverse group of people, you should be aware of who you are highlighting and maybe then point it out, point out this awareness to your students.

It's also been shown to be really helpful in engaging students and in even increasing student performance to talk about how your subject ties into others. Even in fields that might seem pretty niche like thermodynamics or fluid mechanics, if you find ways of tying them in to the various majors that the students in your class might have, they're more likely to put in the time and energy and to be engaged and be excited and curious about the material. So by acknowledging different people's interests and backgrounds, by tying in your material to others and showing its interdisciplinary nature, you can help create a more inclusive classroom.

Finally, it's important to foster in yourself a growth mindset over a fixed mindset. What a growth mindset is the belief that intelligence is not a fixed pre-determined quality, but it's something that can be developed through learning. And by believing that and by approaching your course believing that your students can learn more and can perform better by giving them the right scaffolding and tools in your teaching and your course materials, your students will be better set up to succeed.

This brings me to these ideas that I mentioned before of equity, equality, and equal opportunity. So what are these terms?

One way that you could approach this idea of equality in the classroom is equality means treating everyone the same. That regardless of where someone comes from, you give everyone the same resources, the same materials and treat everyone the same. But while this sounds all right, this only really promotes fairness if everyone is starting from the same place.

Often an illustration used to describe these terms of equality, equity, and equal opportunity is there's a baseball game. And they're spectators of various heights and there's a wall, and the tall person can see over the wall, but the middle height person might have to go on their tippy toes to see over the wall, and the short person has no chance of seeing the game whatsoever. So doing equality in this situation means treating all of them same, giving no one anything, and this leads only the tallest person to be able to really see and participate in the event.

So one step in the right direction would be what's called equity. This means giving more resources to certain students. In the context of this baseball game, it means perhaps giving the shortest person two stools to sit [stand] on, and the middle person one stool, and now everyone seems to be at the same height and everyone can look over the wall. However, the problem with equity is that we still have this wall there and we still put a disproportionate burden on certain students to take advantage of these resources that we're providing, and this can meet a heightened awareness or sensitivity to this different background with which they're approaching the event or the learning.

So what we really should strive for, is what's called equal opportunity. This means giving everyone the opportunity to be successful. And in the context of the baseball game, it means really restructuring the environment. You tear down the wall and you build a fence, a fence that is more see-through, so you're still protecting yourself from the players, you're still separating the spectators, but now everyone can enjoy the game and see it without being given access to different resources. In the context of a classroom this means being accessible - both you as a TA being accessible and creating accessible learning environments. It means giving constructive feedback and grading. It means really changing your classroom structure to be inclusive inherently and it means using tools of what's called transparent teaching, which I'll go into a little more detail about. So, like I said, equal opportunity is what should we should really strive for in the classroom.

What does accessibility look like in the context of online learning? One thing that I would really recommend that TAs and professors do is do closed captioning or transcription on their lecture videos. This allows students that might be hard of hearing to engage with the material and it can be done often through Zoom or through other third party applications that will make subtitles on your videos. It's also really useful maybe for people like me that speak very quickly, and students might want to have a visual aid to be able to understand what I'm saying better, or for people who might mutter-mumble a little bit, or who might be a little more difficult to understand, these tools can be really useful.

Another thing that you should do is repeat questions that are asked out loud or in the chat box during Zoom lectures. So before you give your answer, just repeating what the student asks to make sure everyone heard the question.

Another thing you can do is you have to consider, given these times, that students might not be able to engage synchronously with your courses and you should create opportunities for asynchronous engagement. This includes recording your lectures, and you should inform your students about video recording - both the students that might not be able to make the lectures that they'll be made available, but it's also important to inform the students that are attending your lectures that they might be recorded.

Any video recordings where students faces or videos are shown should have students' permission to be posted, and they should only be posted on sites that require Caltech credentials to access. Finally, you should always save the chat messages in case there's certain discussion or components of active learning that are included in the course in that medium.

I would recommend that TAs and professors include an accessibility statement on your course syllabus and/or in Canvas, and an example of this is provided through the CTLO and on Caltech's new teach.caltech.edu which has resources for online teaching.

Finally, I would suggest that all teachers really try and eliminate high cost materials and books where possible, and provide either free or less expensive materials and encourage the use of more affordable early editions of textbooks.

Another component of creating equal opportunity in the classroom that I mentioned before is called transparent teaching. Transparent teaching means transparency when you're a teacher in defining the purpose of the tasks that you're having students do, being transparent and clear in defining the tasks that you want them to do, and then how you're going to evaluate them. So the why, the how, and then how they'll be graded. You can implement this by first thoughtfully designing the course syllabuses, and in these be very explanatory and use positive language, not negative or reprimanding language that might cause students to feel a little more stressed out or scared about approaching you or taking this class. By teaching with transparency, like I was saying before, you should really explicitly focus on and even state how and why students are learning the course content in particular ways. This has been shown to promote students' conscious understanding of how they learn, and in fact these transparent teaching and learning

methods have been shown to demonstrably enhance student success, particularly benefiting students who are unfamiliar with college success strategies, and they tend to have greater benefits for underrepresented and first generation students. So these are things that you can do which are pretty simple, and by just being clear about how you're doing what you're doing and why, students will perform better and be more engaged in the course content.

Another thing you can do is create rubrics for grading or evaluation. Sometimes you can't do this for a problem set since that would give away all the answers to the problem set, but what you can do is tell students explicitly at the beginning of the class what you'll be looking for. You can say, you know, I am not necessarily looking for the exact right number of significant figures, but I will take off points for wrong units or for not showing all your work.

If you do have a project or a lab report, it's really important to provide students with the rubrics for grading and not expect them to read your mind in terms of what you expect a good assignment to look like. Finally, when either giving examples of historical scientists or creating word problems with hypothetical people in them, try and utilize a variety of names, genders, pronouns, and examples of scientists and leaders for your students to observe and see in this class.

So what does inclusivity look like an online learning?

One example of inclusivity that you can do is to survey students before the start of your class. Especially given these times, it's important to know what technological resources students might have access to, what time zones they might be in, and their year that they're in, what prerequisites they've had - administering a survey like this can already establish a basis for an inclusive classroom.

Second, you can create a sense of community in your virtual classroom. It's easy to write off Zoom as being a place where you can't really create community and it's very distant, but there are a lot of things that you can really do. You can arrive at your Zoom early and engage with students, and tell the students that you'll be there five minutes before, and establish relationships with them before they might feel inclined to turn off their videos and microphones for the lecture. And you should really encourage students asking questions, and if they're not- if they're not usually the type of students that might raise their hand and ask a question out loud, they might still be willing to participate by writing a question anonymously. Encouraging all these things will really make for a more inclusive classroom.

Another thing you can do to create inclusive online learning is communicate frequently and provide as much information as possible through the syllabus, by sending out announcements and emails to your students, and by being clear to your students about how to best reach out to you as professors and TAs, whether that's through Piazza to ask questions, through email, or through question forums on Canvas. Being clear about this to your students will help create inclusive environments.

Be clear about the expectations you have of your students, especially around grading and especially given these times.

Like I mentioned earlier, you should be open to having frequent feedback. From lecture to lecture, you can even create informal polls to see how students are experiencing the course logistics, and you can also set up informal, anonymous polls to gauge students understanding of the course material or whether there are certain sticky points that you might need to go over.

I would recommend that at least once during the term, maybe around or just after the midterm that you give out, that you do one more formal anonymous survey to gauge how students are engaging with the material, students' level of understanding, if they have feedback for you as a TA. You can reach out to the CTLO for ideas on what you should include in these surveys, they're really helpful with that.

Another thing you can do is provide guidelines for in class discussions or engagement in online forums, and setting up respectful environments where people don't feel afraid to ask questions.

Finally, acknowledge the challenges that both students face as learners right now and that you face as a teacher. These are very strange and new times, and we're all getting used to these virtual media and learning, so kind of make it clear to your students that we're all in this together and that we're all learning and trying to adapt as best as we can.

I've put here a summary of some of the things that I've talked about, and I won't go through them all, but this is a useful little summary of active strategies that you can do to address certain concepts, including understanding social identities, mitigating stereotype threat in the classroom, and creating inclusive classrooms, and these are all things that I discussed earlier, but you can just pause here if you want. And if you ever want to look back at what can you do to create an inclusive classroom, this is a really great summary of that.

I've provided here some articles that might be of interest to those of you who want to learn or explore more on this slide and on this next one, so feel free to look at these articles to learn a little more about inclusivity and diversity in the classroom and in STEM.

So for those of you who want to know what to do from here, I would really encourage that you visit the following websites that were created in response to this new phase of online learning. There's teach.caltech.edu that will provide more resources on remote teaching, and you can also visit learn.caltech.edu for resources on learning remotely, and encourage your students to take a look at that latter website as well for information on different resources that Caltech can provide during these times. So with that, I want to thank you for your time and I'm around Pasadena and always available by email or by Zoom. I'm happy to talk more about this topic or many more related to teaching - I'm really enthusiastic about these topics and I hope you all enjoy your teaching experiences here at Caltech as much as I have, and I want to welcome all the new students to Caltech. For all of the returning students who just want to learn a little bit

more about teaching, I just want to say thanks for coming, thanks for listening, and I hope you all have a great day.