UD COE Inclusive Teaching Workshop Series:
Promoting a Positive Student Mindset: Transcript

Introduction
Welcome to the fourth of six modules in the Inclusive Teaching Series. This series was developed by a Faculty Learning Community within the College of Engineering at the University of Delaware and funded by the University of Delaware Center for Teaching and Assessment of Learning. This module is entitled Promoting a Positive Student Mindset.

Which Matters Most
We'll start this module with a fundamental question, namely, what is the primary driver of student success in your classroom. Assume that you are teaching a required course in the undergraduate engineering curriculum, let's say Thermodynamics or Controls. Which of the three factors do you feel most strongly impacts a student's performance in your course. First would be their performance – that is, grades – in pre or co-requisite classes, for instance, Calculus or Physics. Second would be their study skills and behavior in your course, for example, whether they complete all homework assignments independently and attend your lectures. Third is student mindset. By mindset, we mean the views a student holds about their capabilities and how they learn in general and also specifically for your course. Take a minute to think about which of these is the most important factor in a student's success in your course.

Interestingly, a great deal of work has been done on this very issue, and the results might surprise you. Although we as educators tend to put a lot of emphasis on achievements in prior courses and behavior in our own course, the driving factor for student success is actually mindset. A student's beliefs about their own learning greatly influence the behaviors that they demonstrate in a particular course, which in turn affect performance. Since as humans we look for external cues to form opinions about ourselves, performance in your class in turn affects a student's mindset for future courses. Maybe you've seen this feedback loop in action if you teach multiple courses in your engineering program. In a minute, we will discuss strategies for interrupting negative feedback loops and reinforcing positive ones.

More About Mindset
Before we do that, though, we need to unpack the concept of mindset a bit more. At a fundamental level, mindset is similar to self-confidence, although it is specific to a given task or topic. A student in your class may have a very positive mindset towards a particular topic, let's say designing and executing a lab experiment, but a negative mindset towards another related topic, like the technical writing and organizational skills needed to prepare the associated lab report.

| Intro | Inclusivity 101 | Implicit Bias | Mindset | Teamwork | Interactions with Peers and Faculty |

UD COE Inclusive Teaching Workshop Series:
Promoting a Positive Student Mindset: Transcript

As we have already discussed, student mindset is affected by past experiences, so it is unfortunate and not surprising that we see some differences in mindset for engineering students based on gender and race. These differences have been shown to occur even at the very beginning of a student's career and are most likely the result of cultural biases and prior educational experiences. The table below shows data from our own institution, collected for over 1,500 freshmen engineering students within the first week of their first semester on campus. We measured mindset in five critical areas of engineering problem solving and found that women students scored significantly lower than their white male peers in two areas. The first is "engineering application" – that is, applying math and science concepts in the context of designing an engineered solution; and the second is "tinkering" or physical construction and prototyping. In the same study, students of color scored lower in mindset in generalized math and science skills. It is important to recognize that these differences between groups are not grounded in reality; they are beliefs that students hold about themselves even before they undertake any real engineering work. The concern is that these differences in mindset will manifest as real differences in behavior and performance if left unaddressed by us as instructors.

Fostering a Positive Mindset

So let's talk about what you can do to foster a positive mindset in your students. Top of the list is to consciously support what is called a Growth Mindset in your classroom. Growth Mindset is the belief that you can advance your abilities in a particular area through focused effort. It is best understood in contrast to Fixed Mindset, which is the belief that ones' abilities are innate. When presented with a challenging new concept a student with a fixed mindset may become frustrated and give up when the do not immediately grasp the idea, while a student with a growth mindset will continue to try to understand the concept, potentially drawing from additional resources like office hours and TA support. The best way to foster a growth mindset in your classroom is to address it head-on. Tell students that the material that you cover in class may at times be difficult, and that you will hold them to high standards. However, you are confident that they can grow to meet these standards through hard work and resourcefullness.

Mastery Experiences are also an effective strategy for promoting a positive mindset. Mastery Experiences are assignments that allow students to gauge their growth on the way to achieving a bigger goal. For instance, one type of mastery experience is to administer a low weight exam very early in the semester that covers introductory and pre-requisite knowledge. This early exam helps students understand early on where they stand in your course and adjust their study habits to meet your high expectations. In order to be effective, mastery experiences must include specific feedback that must be returned to the students in a timely manner. If you

| Intro | Inclusivity 101 | Implicit Bias | Mindset | Teamwork | Interactions with Peers and Faculty |

require students to submit multiple drafts of a term report but you only return those drafts one week before the final version is due, you have lost all effectiveness of the drafts as a mastery experience.

Last but certainly not least, you can positively affect student mindset through your words and actions in the classroom. Most students – and particularly those with a Fixed Mindset – think that you as the instructor just naturally understand all of the course content and that you do not have to work to gain this knowledge. Simply being more explicit with your own thought processes as you work through a problem can be very helpful. Point out where you have had misconceptions or have made mistakes in the past. If you make a mistake during a lecture, make sure that you address it with grace and style, rather than ignoring it or being defensive. If you employ Active Learning strategies in your classes, also consider using "think alouds" or "think-pair-shares" where students explain a concept to a partner. Again, the idea here is to show students that complex concepts take time to understand and that no one "gets it" on their first try.

Harmful Classroom Practices

We have just covered strategies that you can use in your classroom to promote a positive mindset, but it is important that we also address classroom practices that may inadvertently work against positive mindset. Most concerning is "weed out culture." As an instructor, you should avoid using language that promotes weed out culture such as the example quote shown below. Yes, a certain percentage of your students may not achieve the necessary grades to advance past your course in your engineering program; however, reminding your entire class of this fact does nothing to bolster the performance of those particular students, nor is it particularly motivating for any of the students who will succeed in your course. Promoting a weed out culture will definitely undermine any efforts you have to promote Growth Mindset, and you also run the risk of disproportionally affecting women and minority students with your comments. Just don't do it.

A second classroom practice to avoid is attributing a student's failure to innate abilities. This is the very definition of Fixed Mindset and will undermine the student's resilience in your class and beyond. This is not to say that you cannot or should not address deficiencies in performance. Quite the contrary. Just make sure that you are focused on underlying issues of mindset and behavior that may be driving low performance. For instance, in counseling a student who is obviously failing your course, you may suggest, if they wish to continue in the program, that they audit the class and refocus their efforts on the gaps in their pre-requisite knowledge, either by

retaking a pre-requisite course or seeking tutoring. The wrong approach would be to tell the student that they are "not cut out for it."

Third, we remind you that women and students of color may experience comments and particularly criticism from you very differently than the majority population. Again, we are not suggesting here that you mince words; however, as we have stressed before, you should not call attention to a student's race or gender in classroom or mentoring discussions, especially when you are addressing performance.

Lastly, we will stress again the importance of timely and specific feedback, both positive and negative, as it relates to student mindset. Growth mindset relies on feedback to improve performance. If you are giving your students very generalized feedback, for instance, "you're doing it wrong" or even a positive "good job", you are not helping them grow. Feedback also needs to be timely to be effective. We recognize that providing timely and effective feedback is a challenge, particularly in large enrollment classes, but it is absolutely necessary and can be achieved by having TAs assist you with grading according to pre-defined rubrics.

Take-Away

In concluding this fourth workshop, it is important to recognize that mindset is the primary driver of student achievement in your classes. Although you cannot control a student's mindset directly, there are practices that you can employ – and those that you can avoid – to promote Growth Mindset and disrupt Fixed Mindset.

References

These references provide further information.

| Intro | Inclusivity 101 | Implicit Bias | Mindset | Teamwork | Interactions with Peers and Faculty |