

From Remote to Flipped: Increasing Student Engagement through the Classroom Flip

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Dr. Sarah Zappe is Director of the Leonhard Center for the Enhancement of Engineering Education and Assistant Dean for Teaching and Learning in the College of Engineering at Penn State. She holds a doctoral degree in educational psychology emphasizing applied measurement and testing. Her research interests primarily involve creativity, innovation, and entrepreneurship education.

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Dr. Stephanie Cutler has degrees in Mechanical Engineering, Industrial and Systems Engineering, and a PhD in Engineering Education from Virginia Tech. She is an Assistant Research Professor and the Assessment and Instructional Support Specialist in the Leonhard Center for the Enhancement of Engineering Education at Penn State as well as a co-founder of Zappe and Cutler Educational Consulting, LLC. Her primary research interest include faculty development, the peer review process, the doctoral experience, and the adoption of evidence-based teaching strategies.

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One of the most pervasive messages relating to quality teaching is that students learn more by engaging with the course material. Yet, getting students to engage with the course material can sometimes be challenging. The inverted classroom, or the classroom flip, reverses what is typically done by students during in-class and out-of-class time. Rather than passively listen during in-class time, students do interactive activities, which can vary from solving problems to completing projects. Out-of-class time is spent on listening to recorded lecture or completing other independent activities. The framework of the inverted classroom encourages students to actively engage with course material while other students and the instructor are present and moves the more passive, independent parts of learning to be conducted outside of class. The structure of the framework is ideal, as it allows instructors to be flexible and adaptive with their approaches. This workshop will discuss the classroom flip approach, including challenges and benefits, as it relates to the engineering classroom.

With the transition to remote instruction due to the COVID-19 pandemic, new opportunities could be leveraged to implement a flipped classroom as faculty move back to campus. This workshop can help formulate strategies for how to use teaching videos and materials created during the pandemic as part of a flipped classroom. This workshop is intended for engineering instructors who have not yet flipped their courses but might be interested in doing so in the future. Additionally, we welcome instructors who have previously flipped their class to come share their experience and explore additional strategies related to flipped classroom. The workshop will be interactive and will allow time for participants to consider how they might flip their own course. Instructors are encouraged to bring their course syllabus with them to consider how different course elements can be taught in a flipped setting.

The audience for this workshop would be anyone interested in learning more about flipped classroom. Attendees looking for ideas for what to do with their remote learning materials now that we're heading back to the classroom maybe especially interested.

After participating in the workshop, we expect that participants will be able to:

- Identify the benefits and challenges of the classroom flip instructional approach
- Develop an initial plan for how to flip one unit of a course
- Consider how to use already-developed instructional materials in the classroom flip

The outline of the workshop follows:

1. Introduction and Icebreaker
2. Classroom Flip Overview
 - a. Definitions: What is the classroom flip?
 - b. Benefits of the classroom flip
 - c. Introduction to best practices for in-class and out-of-class activities
 - d. How to ensure that students complete out-of-class preparation work?
3. What can we apply from emergency remote teaching to the classroom flip?

- a. Identification of already-existing materials
4. Application: Beginning to plan to flip your course
 - a. Participants will consider one unit of their course
 - b. Write objectives for that unit
 - c. What activities will be ideal for doing in-class?
 - d. What activities will be ideal for doing as homework?
 - e. Participants will make their plan and then share in small break-out groups
5. Challenges of classroom flip and potential solutions
6. Question and answer time
7. Reflection: What will you take away from this workshop to use in your class?

The workshop will be facilitated by Drs. Sarah Zappe and Stephanie Cutler from Penn State, both of whom have led multiple previous workshops on classroom flip at various institutions and conferences. Their bios follow.

Dr. Sarah Zappe is an educational psychologist specializing in engineering and entrepreneurship education. She holds the position of Assistant Dean for Teaching and Learning and the Director of the Leonhard Center for the Enhancement of Engineering Education at Penn State. Sarah is a deputy editor for the *Journal of Engineering Education* and most recent past Division Chair for the Educational Research and Methods (ERM) Division of ASEE. She serves on advisory boards for multiple NSF-funded projects and is on several task forces with ASEE. Her research interests include failure in student entrepreneurial teams, creativity in engineering education, and faculty development. Sarah has published several journal articles about the classroom flip (e.g., Zappe, Leicht, Messner, & Litzinger, 2009; Zappe & Litzinger, 2016; Velegol, Zappe, & Mahone, 2015). Sarah lives in State College, PA with her 13-year-old son, Ethan, and her two golden retrievers, Carson and Lucy. In her free time, Sarah enjoys paddle boarding, watercolor painting, and planning her next travel adventures!

Stephanie Cutler has degrees in Mechanical Engineering, Industrial and Systems Engineering, and a PhD in Engineering Education from Virginia Tech. She is an Associate Research Professor and the Assessment and Instructional Support Specialist in the Leonhard Center for the Enhancement of Engineering Education at Penn State. She is currently serving as the ASEE ERM Vice-Chair of Programs for ASEE 2022. She previously served on the executive leadership team to establish the ASEE Faculty Development Division and served as the division's Program Chair for the 2018, 2019, and 2020 annual ASEE Conferences. Her primary research interests include faculty development, the peer review process, the doctoral experience, and the adoption of evidence-based teaching strategies. In her free time, Stephanie enjoys reading sci. fi. and fantasy books, kayaking, walking her dog, snuggling her dog, and playing video games.

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