

A Holistic Workshop on Flipped Classrooms

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Abstract

Flipped classrooms take the transmission of content from the classroom to home, and the assimilation of the content at home to the classroom. With smart phones becoming ubiquitous, internet being available at a low cost, self-published multimedia content becoming freely available and easy to create, and evidence-based research showing its effectiveness, flipped classrooms are becoming more popular as a pedagogy in STEM courses. In this interactive workshop, we will discuss the differences between traditional, blended and flipped classrooms, the tools and techniques used to teach a flipped classroom, the challenges and opportunities of teaching a flipped classroom, and the evidence or lack thereof of the effectiveness of flipped classrooms in higher education. The presenter has extensively taught blended, partially- and fully-flipped classes, and will also present the personal lessons learned in the process. Throughout the workshop, the audience will be engaged in developing an outline of how they would flip a classroom including student activities.

Keywords

Flipped classroom, blended instruction, traditional classroom, universal design learning, engineering education research methods.

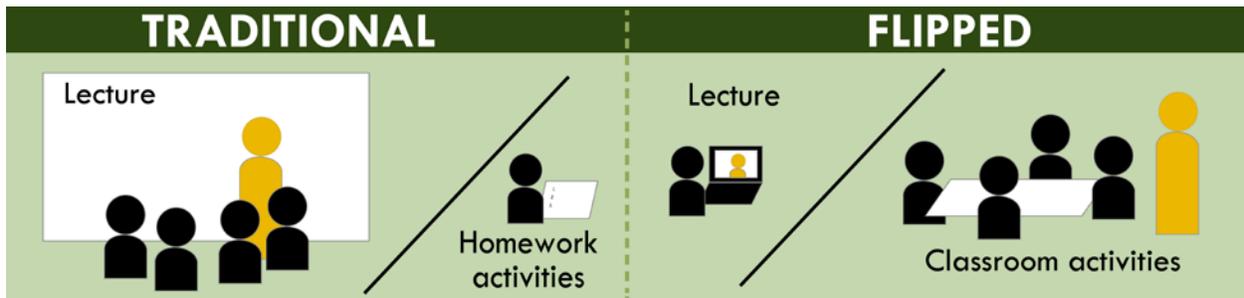


Figure 1. Flipped vs. traditional classroom (Source: University of Washington - Center for Teaching and Learning and Office of the Provost (used with permission))

Learning Objectives/Outcomes

When you complete this workshop, you will:

- 1) be prepared to teach an engineering course in flipped manner using evidence-based best practices,
- 2) know simple but effective technological tools to flip the classroom, and
- 3) be aware of the lessons learned by others in teaching a flipped classroom.

Suggested Reading Prior to Attending Workshop

To get a brief view about flipped classrooms, please visit <http://cft.vanderbilt.edu/guides-sub-pages/flipping-the-classroom/>¹, and to find more about universal design learning, you can visit <http://www.udlcenter.org/aboutudl/whatisudl>².

References

- 1 Brame, C., (2013). Flipping the classroom. Vanderbilt University Center for Teaching. Retrieved November 16, 2016 from <http://cft.vanderbilt.edu/guides-sub-pages/flipping-the-classroom/>.
- 2 “What is UDL?”, Retrieved on November 16, 2016 from <http://www.udlcenter.org/aboutudl/whatisudl>.
- 3 Barba, L., A. Kaw, J. De Loux, “Guest Editorial: Flipped Classrooms in STEM”, Advances in Engineering Education, ASEE, Autumn 2016, Vol. 5(3).

Facilitator

Autar Kaw (autarkaw.com) is a Professor of Mechanical Engineering at the University of South Florida. He has been at USF since 1987, the same year in which he received his Ph. D. in Engineering Mechanics from Clemson University. With major funding from NSF, he is the principal contributor in developing the multiple award-winning online open courseware for an undergraduate course in Numerical Methods. His current research interests include engineering education research methods, adaptive learning, open courseware (OCW), massive open online courses (MOOCs), flipped classrooms, and learning strategies. He is a recipient of the 2012 U.S. Professor of the Year Award and the 2011 ASEE National Teaching Award. Recently, he was one of the guest editors of a special issue on flipped classrooms in STEM for the ASEE Advances in Engineering Education Journal³. He can be reached at kaw@usf.edu.

