

# Learning to Teach in the Flipped Classroom

Cynthia M. Furse, Donna Ziegenfuss, Stacy Bamberg  
University of Utah  
Salt Lake City, Utah USA  
cfurse@ece.utah.edu

**Abstract**—The flipped classroom has gained tremendous recent popularity. This paper reports on a new faculty training program for helping and mentoring faculty to learn to teach with the flipped classroom. Several modules were piloted in 2013-2014, including active teaching, how to create video lectures, content selection for the flipped classroom, implementing flipped lectures, helping your students learn flipped, and assessing the flipped classroom. This program is available free online for interested faculty.

## I. INTRODUCTION

One of the most promising transformative trends in STEM education is the development of new hybrid courses that combine individualized online learning activities with group learning activities in the classroom. In the ‘Flipped Classroom’ the lectures and homework are ‘flipped’. Instead of lectures in class and homework out of class, students watch video lectures prior to class. The in class face-to-face (F2F) time is then used for active and engaged problem solving, usually working with peers, guided by the professor. [1][2] Examples in electromagnetics include Introduction to Electromagnetics [3] and Numerical EM [4], both initially flipped by Dr. Furse in 2007.

‘Flipping’ the lectures and homework has been shown to be much more effective than the traditional ‘sage on the stage’ lecture format for students, and faculty alike. [5][6] While most of the research on the flipped classroom has focused on enhanced student satisfaction and learning, this paper will focus on the effectiveness of a new program to support faculty who are transforming their teaching with this method.

## II. THE TEACH-FLIPPED TRAINING PROGRAM

This new faculty training program [7] is designed for the special needs of the flipped classroom instructor. The training program itself is modeled on the flipped classroom, with weekly online modules over the course of a 15 week semester. Modules cover pedagogical best practices including active learning, creating and using multimedia or video materials for faculty and their students, and preparing for/teaching 2 wks of a fully flipped classroom. For each module, faculty VIEW a video from a master teacher on that pedagogical subject (including video examples of how this is used in a real classroom), READ the relevant literature on the subject, TRY

the concept out in their own real classroom, REFLECT on their experience via an online blog/forum, and SHARE and comment on the experiences of others while receiving feedback on their experience from peers and experienced instructors. The entire program is available asynchronously online, to meet the challenging schedules of faculty. It is available with free, open access, available locally, nationally, and globally for use by individual faculty or by institutional faculty development centers.

This training program provides the ‘just in time’ information and support for faculty trying out a teaching method that is new to them. It is designed for the flipped classroom, but much of the material is relevant to a wider variety of hybrid and online courses. This training program is meant to help both early adopters and more traditional professors who may need additional support and encouragement to become comfortable and proficient trying new pedagogical approaches.

## III. CONCLUSION

An initial pilot of the Teach-Flipped Faculty Program was run in December 2013-March 2014. Several modules were piloted, including active teaching, how to create video lectures, content selection for the flipped classroom, implementing flipped lectures, helping your students learn flipped, and assessing the flipped classroom. Initial response was very good, and several faculty are preparing flipped course material for a variety of courses. This program is available free online for interested faculty.

## ACKNOWLEDGEMENT

The authors would like to thank the National Science Foundation for its generous support of this project through grant DUE-1245904. Additional support for this project was provided by the University of Utah and Salt Lake Community College.

## REFERENCES

- [1] C. Furse, ‘A Busy Professor’s Guide to Sanelly Flipping Your Classroom,’ 2013 IEEE AP-S International Symposium on Antennas and Propagation and 2012 USNC/CNC/URSI Meeting in Lake Buena Vista, FLA, July 7-12, 2013
- [2] C. Furse, Teaching without Lecturing, IEEE Antennas and Propagation Magazine, Vol 53. No. 5, Oct. 2011. pp. 176-179.
- [3] [www.ece.utah.edu/~ece3300](http://www.ece.utah.edu/~ece3300)
- [4] [www.ece.utah.edu/~ece6340](http://www.ece.utah.edu/~ece6340)

- [5] Sams, & Bergmann, J. (2012). How the flipped classroom is radically transforming learning. *The Daily Rift*. Available online at: <http://www.thedailyriff.com/articles/how-the-flipped-classroom-is-radically-transforming-learning-536.php>, April 15, 2012
- [6] Toto, R., and Nguyen, H. (2009). Flipping the work design in an industrial engineering course, Proceedings, 39<sup>th</sup> ASEE/IEEE Frontiers in Education Conference, NJ: Piscataway, IEEE Press
- [7] [www.Teach-Flip.utah.edu](http://www.Teach-Flip.utah.edu)