

Abstract Submitted  
for the DFD13 Meeting of  
The American Physical Society

**Flippin' Fluid Mechanics – Using Online Technology to Enhance the In-Class Learning Experience** D.R. WEBSTER, D.M. MAJERICH, Georgia Tech — This study provides an empirical analysis of using online technologies and team problem solving sessions to shift an undergraduate fluid mechanics course from a traditional lecture format to a collaborative learning environment. Students were from two consecutive semesters of the same course taught by the same professor. One group used online technologies and solved problems in class and the other did not. Out of class, the treatment group watched 72 short (11 minutes, average) video lectures covering course topics and example problems being solved. Three times a week students worked in teams of two to solve problems on desktop whiteboard tablets while the instructor and graduate assistants provided “just-in-time” tutoring. The number of team problems assigned during the semester exceeded 100. Weekly online homework was assigned to reinforce topics. The WileyPlus online system generated unique problem parameters for each student. The control group received three-50 minute weekly lectures. Data include three midterms and a final exam. Regression results indicate that controlling for all of the entered variables, for every one more problem solving session the student attended, the final grade was raised by 0.327 points. Thus, if a student participated in all 25 of the team problem solving sessions, the final grade would have been 8.2 points higher, a difference of nearly a grade. Using online technologies and teamwork appeared to result in improved achievement, but more research is needed to support these findings.

D.R. Webster  
Georgia Tech

Date submitted: 24 Jul 2013

Electronic form version 1.4