

Abstract Submitted
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Flippin' Fluid Mechanics – Quasi-experimental Pre-test and Post-test Comparison Using Two Groups D.R. WEBSTER, D.M. MAJERICH, J. LUO, Georgia Tech — A flipped classroom approach has been implemented in an undergraduate fluid mechanics course. Students watch short on-line videos before class, participate in active in-class problem solving (in dyads), and complete individualized on-line quizzes weekly. In-class activities are designed to achieve a trifecta of: 1. developing problem solving skills, 2. learning subject content, and 3. developing inquiry skills. The instructor and assistants provide critical “just-in-time tutoring” during the in-class problem solving sessions. Comparisons are made with a simultaneous section offered in a traditional mode by a different instructor. Regression analysis was used to control for differences among students and to quantify the effect of the flipped fluid mechanics course. The dependent variable was the students' combined final examination and post-concept inventory scores and the independent variables were pre-concept inventory score, gender, major, course section, and (incoming) GPA. The R-square equaled 0.45 indicating that the included variables explain 45% of the variation in the dependent variable. The regression results indicated that if the student took the flipped fluid mechanics course, the dependent variable (i.e., combined final exam and post-concept inventory scores) was raised by 7.25 points. Interestingly, the comparison group reported significantly more often that their course emphasized memorization than did the flipped classroom group.

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