

Interaction Effects of a PBL Pedagogy, a Flipped Classroom, and an Advanced Physical Space for Collaborative Learning

FOEE Theme: Delivery

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Background

- past 4 yrs: developed *flipped approach* by using on-line screen movies for delivery and hands-on small group labs (comp tools course)
- current: new *SCALE UP inspired classroom* available, plan to apply *flipped model* with screen movie delivery w/ *problem-based learning* in the new instructional environment
- target class: junior-level, engineering class in *sustainable systems modeling*

Edu Obj & Research Questions

- strengthened competencies for *life-long learning*
 - strengthened competencies for *collaborative problem solving*
 - strengthened competencies for *systems-level problem solving*
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- in the mix of delivery (flipped classroom), pedagogy (PBL), and learning space (SCALE UP inspired classroom):
 1. *which facets are synergistic?*
 2. *which are antagonistic?*

Learning Activities & Materials

- *course organization* built around a set of authentic modeling problems, each focused on a sustainable system
- *materials under development* focus on web-based screen movies for the basic concepts for each problem and for the use of the software (iTHINK)
- *course assessment* by authentic problems not seen before by students - two such assessments will be made, at the course mid-point and at the course end, and each will be an in-class exercise

Research Plan

- *research methodology*: mixed methods research focused on (a) objective outcomes data for quality of *deep problem solving*, (b) attitudinal survey data on student-perceived *self-efficacy for deep problem solving*, and (c) case studies of two selected student groups over the entire term
- *expected results*: by triangulation of the results from the three types of study data, we will gain insight into the ways the three specific factors (flipped classroom / PBL / SCALE UP inspired room) interact