PROGRAM OF 2018 ANNUAL MEETING PRESENTATIONS

Course Transformation Case Studies
Friday, September 21st 9:00-10:10
Burge Union

Case Study 1 (Forum B)

Trestle @ UTSA

JoAnn Browning and Timothy Yuen, University of Texas San Antonio

In response to the calls for improving student success in engineering, TRESTLE @ UTSA implemented an embedded expert model that pairs faculty and doctoral students from the College of Education and Human Development (COEHD) with faculty in the College of Engineering (COE) to transform course designs and teaching practices to increase student engagement and success. This presentation will discuss UTSA's implementation of the embedded expert's model and the impact of the course transformations in terms of student and instructor outcomes.

Case Study 2 (Forum A)

The impact of classroom transformation on DFW rates for first-time freshmen and underrepresented groups in introductory geology courses

Jennifer Roberts, University of Kansas

We transformed two large-enrollment introductory geoscience courses (160-270 & 60-190 students) at the University of Kansas into active-learning classrooms, and systematically analyzed student achievement data over a 10-year period. One course is required for majors in geology as well as majors in petroleum and architectural engineering, and also serves as a natural science distribution requirement for undergraduate bachelor degrees. The other course serves as a natural-science distribution requirement for undergraduate bachelor degrees. In both courses, there were measurable but not statistically significant (<95% confidence) improvements in overall student performance in the transformed course when compared to all student performances in the untransformed course, as judged by overall decreases in %DFW (percentage of students in the course earning D or F grade, or Withdrawal). In the majors course, however, there were significant decreases in %DFW in female students (-9.5% decrease) and also—though not statistically significant—students from underrepresented-minority groups (-5.6% decrease). During the 10-year study, female students remained ~30% of the class, while underrepresented-minority student enrollment increased from 10.8% to 17.1%, consistent with institutional undergraduate enrollment trends. In the non-majors course, %DFW for first-time freshman decreased by 7.6%. In sum, our data further support previous studies that demonstrate a narrowing in student performance gaps with active-learning practices for at-risk and underrepresented populations.

Case Study 3 (Forum C)

Successes and lessons learned in transforming a physics capstone laboratory course

Bei Cai, Queen's University

We recently transformed our physics capstone laboratory course at Queen's University. Before transformation, students did confirmation inquiry activities where they followed instructions given in the lab manuals to confirm known experimental results. We found that student engagement and lab skill improvement were lacking. We changed these prescribed experiments to guided inquiry activities where students had to design their own experimental procedures. Students appreciated the opportunities for practicing and improving their design and problem solving skills. We were also happy to see that in general they performed better and acquired deeper learning compared to students in previous years. However, it was challenging to get the team of 3 instructors (2 senior research-focused Canada Research Chairs and a new hire) all on board with these changes. We also fell into some of the common teaching pitfalls including poor course organization, lack of prompt feedback to students' work, and unclear expectations for some assessments. This case study should provide a rich conversation in faculty buy-in, student buy-in, and strategies in avoiding teaching pitfalls.

Poster Session
Friday, September 21st 11:00 – 12:00
Burge Union Forum C

*Group A presenters: please be at your posters from 11:00-11:20

*Group B presenters: please be at your posters from 11:40-12:00

Transformative practices in engineering education ***(A)***
Robin Nelson *and* ***Stephanie Garcia****, University of Texas San Antonio*

Study habits that set the bar: Identifying the study methods of high-performing students ***(B)***
Miriam Martin*, University of California Davis*

Impact of Embedded Teaching and Learning Fellows at Queen's University ***(A)***
Bei Cai*,* ***Deena Salem****, and* ***Stacey Zhao****, Queen's University*

Active learning in an introductory computer science course for non-majors ***(B)***
Meghan Allen*, University of British Columbia*

How do we improve grades without lowering the standards? ***(A)***
Sarah Legresley Rush*, University of Kansas*

Supporting teaching autonomy in the New Faculty Workshop ***(B)***
Stephanie Chasteen*, University of Colorado Boulder*

Development and initial assessment of a new student-centered upper division human physiology course ***(A)***
***Natalia Caporale**, University of California Davis*

Peer mentoring for all: Investigating the feasibility of a curricular-embedded peer mentoring structure ***(B)***
*Molly McVey, **Caroline Bennett**, William Collins, Remy Lequesne, Carl Luchies, Sara Wilson, Elaina Sutley, Matt Fadden, and Chris Melgares, The University of Kansas*

The Bay View Alliance ***(A)***
***Mary Huber** and **Pat Hutchings**, Bay View Alliance*

Creating Online Interactive Instructional Modules for Mechanics of Materials ***(B)***
*[1]**Lin Liu**, [2]John Liu, [1]Carl Luchies, [1]Meagan Patterson: [1]University of Kansas, [2]University of St. Thomas*

Faculty Responses to the Teaching Practices Survey Based on Time Spent Lecturing ***(A)***
***Gülnur Birol**, Adriana Briseño-Garzón, Andrea Han, UBC*

An International Study of Teaching Practices in Higher Education ***(B)***
***Gülnur Birol**, Adriana Briseño-Garzón, Andrea Han, Simon Bates, UBC*

The Graduate Student Fellows Program: A Unique Opportunity for Professional Development in Evidence-Based Teaching Practices ***(A)***
***Matt Smith**, Aaron Koop, **Dani Chapa** and **Kathryn Vaggalis**, University of Kansas*

Deepening Student Learning in Modeling Dynamics ***(B)***
***Carl Luchies** and Aaron Koop, University of Kansas*

Insights from Institutional Data on the Impacts of Transforming Intro Biology ***(A)***
***Mark Mort**, **Jenny Archibald**, Trevor Rivers, Jenny Weighorst*

Metacognitive activities integration in the classroom from skills to content and expert thinking ***(B)***
***Cheryl Pinzone**, University of Colorado Boulder*

Learning Objective Outcomes in an Introductory Engineering Flipped Course – EECS 140/141 ***(A)***
*David Johnson and **Molly McVey**, University of Kansas*

Functional Functions: Transfer of Math Proficiency in Physics and Chemistry ***(B)***
*Grotmeyer, Elizabeth, **Jennifer Delgado**, Sarah Rush, Drew Vartia and Chris Fischer, University of Kansas*

Overcoming Bottlenecks in a Computer Security Course ***(A)***
Apu Kapadia, *Indiana University Bloomington*

Difficulties in Applying Principles in an Animal Behavior and Neuroscience Course ***(B)***
*Laura Hurley, Ph.D. and Kayleigh Hood (**presented by Middendorf and Rehrey**), Indiana University Bloomington*

Lunch Speaker
Friday, September 21st 12:00-1:30
Burge Union Forum C

Traveling with TRESTLE: Strategies for Strengthening Your Work in Course Transformation

Presenters: Mary Huber and Pat Hutchings, Bay View Alliance

In this lunch-time session, Mary Huber and Pat Hutchings—drawing from their case studies of TRESTLE departments--will share four strategies for advancing and building on course transformation efforts in your various disciplinary and institutional settings. Discussion at tables will invite your reflections and additions. The session will conclude with a look at what it will take to support and sustain this work going forward—a central theme of the afternoon's meetings and discussions.

Workshop
Friday, September 21st 2:00-3:15
Burge Union Forum C

Presenter: Warren Code, University of British Columbia

Title: Sustaining Change

Workshop Description: The goal of this workshop is to identify sustainability strategies at two levels: 1) those that will help individuals or teams on campuses sustain and continue to improve the changes they've designed and implemented in their classes to date, and 2) those that will help individuals or teams on campuses continue the change efforts in their departments (post funding) more broadly. Participants will work together to develop and share strategies for fostering continuous improvement of courses and for sustaining campus or department momentum towards transformed STEM teaching/course design.

Demonstrations
Friday, September 29th 4:15-5:15
Slawson Hall (Earth, Energy, Environment Center)

Round 1 (4:15-4:45)

Using projectile launchers to teach uncertainty and modeling
Jennifer Delgado, University of Kansas

Zybooks: A web-based textbook replacement
Sandy Irani, University of California Irvine

Investigative labs & argument-driven reports in Studio Physics
Kathleen Foote, University of British Columbia

Developing and implementing a case study on mapping, complementation and epistasis appropriate for an undergraduate genetics course
Robert Ward, University of Kansas

Privacy management on mobile devices
Sameer Patil, University of Indiana Bloomington

Round 2 (4:45-5:15)

Shuffle Up
Rebecca Machen, University of Colorado Boulder

Lessons learned from offering a choice project in a large organic chemistry class
Jackie Stewart, University of British Columbia

Incorporating hands-on activities for deeper and engaged learning
Elaina Sutley, University of Kansas

Beyond the Jeopardy PowerPoint: An exam review game for TAs (or instructors) that maximizes student participation.
Adrienne Williams, University of California Irvine

What makes a productive team?
Derek Reamon, University of Colorado Boulder

Mini-Workshops
Saturday, September 30th 8:30-10:45
Burge Union

Mini-Workshop Round 1 Options

1. **Title:** Getting around student pushback & passiveness in active learning classrooms

Presenter: Stephanie Chasteen, University of Colorado Boulder (Forum A)

Abstract: Are you using interactive techniques in your classroom, and are worried about student engagement? Do students complain about the active learning components of your class, or are reluctant to talk to their peers during activities? This interactive workshop will explore ways to help your students get the most out of interactive techniques, through addressing pushback and creating a positive learning environment. We will analyze the problem in your class, and discuss concrete strategies to address it.

2. **Title:** Thoughtful teaching assignments for long term sustainability

Presenters: Mark Mort, Trevor Rivers, Jenny Archibald, and Chris Haufler (Forum B)

Abstract: This mini-workshop will explore ways to achieve sustainability in course transformation through deliberate, thoughtful teaching assignments. Examples of how establishing teaching teams has promoted the wide scale adoption of active teaching practices and sustainable results will be discussed from the perspectives of a department chair, a tenured faculty member, and an assistant teaching professor. Examples of how teaching teams can effectively implement active learning in large enrollment classrooms will be provided.

3. **Title:** Representing your teaching contributions for evaluation context

Presenters: Andrea Greenhoot and Doug Ward, University of Kansas (Forum C)

Abstract: TRESTLE participants are investing substantial time and energy into improving their courses and their students' learning, and it will be important to make those efforts visible to others. This workshop will focus on how instructors can represent the intellectual work in their teaching, along with the impact on students' learning, for promotion and tenure, merit reviews, and other evaluation contexts. The conversation will be organized around a multi-dimensional framework for documenting and evaluating teaching that the session facilitators are exploring through an NSF-funded project. The overall goal is for participants to identify ways to more comprehensively document and represent their teaching practice so that contributions to educational improvement can be better documented, recognized, rewarded, and eventually, institutionalized. **This workshop will be offered in both Round 1 and Round 2*

Mini-Workshop Round 2 Options

1. **Title:** Facilitating Student Teams

Presenters: Caroline Bennett and Molly McVey, University of Kansas (Forum A)

Abstract: This interactive workshop will focus on exploring best practices for facilitating student teams in coursework. Topics will include team formation, development, and ensuring good group functionality and dynamics. Two engineering courses, *CE 562: Design of Steel Structures* (a fourth year civil engineering course) and *ME 320: Dynamics* (a second year mechanical engineering course), will be used as case studies with which to highlight, in particular, the importance of team development and the need for immediate feedback and accountability. The facilitators will draw upon the experiences of the participants, and will facilitate exploration of how participants' use of student teams in their courses can be further leveraged for student success.

2. **Title:** What theories underlie your teaching and course design?

Presenters: Joan Middendorf and George Rehrey, Indiana University (Forum B)

Abstract:
Different educational theories are used for different purposes and can be complementary. Theories of difficulty, such as threshold concepts, bottlenecks, tacit knowledge, or inert knowledge concern the hurdles of content. They foreground what aspects prove consistently troublesome and describe the problem to be solved. Theories of pedagogy, on the other hand, such as Decoding the Disciplines, organize the teaching-learning process to improve results by using strategies likely to foster learning (Perkins, 2008). In order for it to have an influence on student learning, a theory of difficulty requires a theory of pedagogy. Educators build models to test their theories. In this workshop, participants will work individually and in small groups to discover the theories underlying their own course transformation work.