

Provost's Symposium on Teaching

The Research and Practice of Teaching

Day Two – ILR Room 225

Time	Session	Abstract
1:00 p.m. - 2:30 p.m.	Session 1: Putting the pieces together: teaching mathematics with medieval Islamic tilings Speaker: Courtney Roby, Associate Professor in Classics	In the team-taught course, The Art of Math: Mathematical Traditions of Symmetry and Harmony, we look for ways to teach mathematics as a creative, culturally contextualized endeavor. In this session, we will discuss the use of historic tiling patterns from the medieval Islamic world to engage students in exploring concepts of proof, geometrical intuition, and the balance between theoretical exactness and pragmatic approximation.
	Session 2: A mathematical active-learning experience Speakers: Timothy Riley, Professor in Mathematics; Marie MacDonald, Lecturer in Mathematic	We will invite the symposium participants to engage in an active-learning mathematics activity.
	Session 3: Developing problem solving skills through guided activity sheets Speaker: Ashim Datta, Professor in Biological and Environmental Engineering	Helping a learner develop expert problem-solving skills is always a challenge. We first break down the problem-solving process into simpler but generic steps, usable even outside of one class. Guided activity sheets, expanding on these steps, provide a scaffold that makes the process less intimidating. These guided activities also decrease the chances of getting distracted and help learners stay focused by having a workflow. The worksheet questions are almost infinitely stretchable to address a diverse range of learner skills.
	Session 4: Using 3D animation software to teach mastery of anatomy and physiology Speaker: Darlene Campbell, Senior Lecturer in Biological Sciences	3D visualization anatomy technology was adapted to an autotutorial comparative physiology course. Using 3D Organon in individual tutoring and oral testing sessions, students were able to visualize and manipulate anatomical structures and connections as they learned and demonstrated their mastery of physiology. Additionally, teaching assistants gained experience in utilizing this technology in interactive settings.
2:30 p.m 2:45 p.m.		Coffee break and transition time





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Time	Session	Abstract
1:00 p.m. 2:30 p.m.	Session 1: Avatar-based group activities in virtual classrooms Speaker: Andrea Won, Assistant Professor in Communication	Explore protocols for connecting students in virtual environments to discuss class concepts in groups. This includes addressing accessibility accommodations and technical support with limited resources.
	Session 2: Using the online platform Perusall to engage students in pre-class readings Speaker: Felix Thoemmes, Associate Professor in Psychology; Human Development	Persuall is an online platform that allows students to annotate pre-class readings and discuss content with their peers and the instructor. Comments from students can be rated by an algorithm, and summary reports of common questions and misunderstandings can be com- piled automatically. As part of the Active Learning Initiative in the Psychology department, several instructors used Perusall in their courses. This talk introduces the software, and shares some insights that were gathered.
	Session 3: Creative learning with clicker questions Speaker: Ron Harris-Warrick, William T. Keeton Professor of Biological Sciences	Clicker questions are often used in science classes to test knowledge, but they can also be used to encourage creative thinking. I will discuss how a series of increasingly complex questions can lead to new understanding of novel concepts that were not taught in lecture.
	Session 4: Replication of previous studies during class Speaker: Connie Yuan, Professor in Communication; Global Development	In this exercise, students respond to the same prompts used in published studies. During the follow-up debriefing session, I ask students to report their reactions to the experiments before revealing the author's intentions. When findings from their class activities deviate from the published results, they discuss why they failed to replicate previous findings, along with the conceptual implications of their failed attempts.
2:30 p.m 2:45 p.m.		Coffee break and transition time





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Day Two – ILR Room 423

Time	Session	Abstract
1:00 p.m. 2:30 p.m.	Session 1: Avocados, strawberries and the Supreme Court: Why much of what you think you know about fruit is wrong Speaker: Marvin Pritts, Professor in the School of Integrative Plant Science	An important skill for botanists is to learn how to classify plant parts correctly. Accurate classifica- tion and naming help reveal underlying developmental and evolutionary relationships. Often these botanical terms become generalized over time and lose scientific meaning. This learning activity helps students understand why common terms for familiar fruits are often misleading, why scientists use a different approach to classification, and how disputes about what things are called sometime require a legal remedy.
	Session 2: Role playing exercises as a teaching tool for global/public health Speaker: Laura Harrington, Professor in Entomology	In this public health role-playing exercise, students are asked to consider different perspectives and competing demands surrounding a malaria drug trial in a vulnerable community in Thailand. Students apply their unique human perspective (social, cultural, etc.) and their knowledge of malaria, maternal mortality, HIV/AIDS, and medical ethics to the proposed scenario. Each student is assigned a role with a detailed description of their situation and motivations. Students only know the perspectives, status, and motivations of their own role, not others', and must act "in character" to discuss a malaria drug trial. The discussion is mediated by the instructor/TA. Students come out of their roles at the end of class to discuss several questions that probe and reinforce their understanding of the topic.
	Session 3: Interactive design critique icebreakers Speaker: Jeff Rzeszotarski, Assistant Professor in Information Science	In classes that combine programming and visual design skills, it can be challenging to push students to critique their work and develop a sensibility for design, especially in large classes. In this talk, I will demonstrate one technique I use to energize students at the start of a large class session and improve their critical eyes.
	Session 4: Active learning with statues on the Cornell campus Speaker: Verity Platt, Professor in Classics	An activity in my course, Statues and Public Life, took students out of the classroom one day and into their own public space. By leading them through questions applied to statues in the Arts Quad and Sage Chapel, a worksheet helped them to understand major concepts underpinning the course as a whole. This activity allowed them to discuss concepts they could apply to public monuments in other contexts in future sessions, as well as interact with each other and the wider campus community.
2:30 p.m 2:45 p.m.	Coffee break and transition time	





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Day Two – ILR Room 225

Time	Session	Abstract
2:45 p.m. - 4:00 p.m.	Session 1: Transformation of a required, undergrad lab course into a partially flipped, active learning course Speakers: Mark Campbell, John A. Mellowes Professor; Hadas Ritz, Senior Lecturer in Mechanical and Aerospace Engineering	System Dynamics has been the focus of two successive years of revisions as part of the Active Learning Initiative in Mechanical and Aerospace Engineering. Key aspects of the transformation are: (1) reorganizing the course material around four modules, each with its own lab, homeworks, and quintessential application, and (2) a "semi-flipped" classroom structure with student active work during two thirds of the lecture sessions. We describe the iterative process of transformation, with special emphasis on lessons we learned and how the course has developed in response to our experiences.
Session 2: Transforming the undergraduate neuroscience laboratory with an inexpensive, student-constructed, fluorescent microscopeFluorescence microscopy is a cru- undergraduate teaching laborator the principles of fluorescence, ne construct their own epifluorescent to identify synaptic structures, m This inexpensive microscope has neuroscience experience.Session 3: Supporting in-class programming activities at scaleThe best way to learn programmi rransformation talk, I share the le introductory programming cour spent practicing programming. T activities for 200+ students duri programming activities, providin coding issues on their own.	Fluorescence microscopy is a crucial technique in neuroscience, but it is rarely used in undergraduate teaching laboratories due to its expense. Here we introduce students to the principles of fluorescence, neural imaging, and image quantitation by enabling them to construct their own epifluorescence microscope. Students use these self-built microscopes to identify synaptic structures, measure neural activity, and detect neuropeptide secretion. This inexpensive microscope has the potential to revolutionize the undergraduate neuroscience experience.	
	Session 3: Supporting in-class programming activities at scale Speaker: Kyle Harms, Lecturer in Information Science	The best way to learn programming is to practice programming. But how can your students successfully practice programming during class, especially in large classes? In this course transformation talk, I share the lessons learned from flipping a large undergraduate introductory programming course (INFO 2300) where the majority of class time was spent practicing programming. This talk will discuss how to support in-class programming activities for 200+ students during a typical 50 minute "lecture." Topics include scaffolding programming activities, providing in-class TA support, and helping students troubleshoot coding issues on their own.
4:00 p.m 5:00 p.m.	Receptio	on: Celebrating 10 years of the Active Learning Initiative





Provost's Symposium on Teaching

Day Two – ILR Room 229

Time	Session	Abstract
2:45 p.m. - 4:00 p.m.	Session 1: Environment & Sustainability Capstone Courses: Developing shared resources to support active and engaged learning Speakers: Pete McIntyre, Associate Professor; Kira Treibergs, Postdoctoral Associate in Natural Resources and the Environment	Project-based capstone courses in Environment and Sustainability challenge students to collaborate with both peers and community partners to address real-world needs. Success in these courses can be enhanced by supporting instructors in managing teamwork among students, stakeholder engagement, and a product-oriented outcome. We will discuss how shared materials could catalyze the launch of new courses with these features, even when direct personnel support is not available. We will offer examples from the Lake Source Cooling Capstone course in Spring 2021, which engaged students with ecological, economic, energy, and public relations perspectives on a major Cornell sustainability initiative.
	Session 2: Implementing active learning in an introductory ecology course Speakers: Robert Howarth, David Atkinson Professor of Ecology and Environmental Biology; Justin St. Juliana, Senior Lecturer in Ecology and Evolutionary Biology	Over several semesters, we introduced active learning in an introductory ecology course with a series of incremental changes. In this talk, we will share what we found to be the greatest challenges and what we believe has been most successful about the changes.
	Session 3: Foundation, not afterthought: embedding science communication training within the undergraduate science curriculum Speaker: Mark Sarvary, Director of the Investigative Biology Teaching Laboratories	Undergraduates are no longer only consumers but producers of scientific information. Employees and postgraduate programs are showing an increasing interest in undergraduates with advanced communication and interpersonal skills. Science communication education should no longer be a postgraduate afterthought, but rather a foundation of undergraduate science education. Science communication training can help students understand the scientific process, become science literate, identify the role of science in society and shape their interdisciplinary views. In this talk, I discuss how I transformed my classes with the sup- port of a CTI Innovation Grant, to teach students science communication at the same time they learn the scientific process.
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2:45 p.m. - 4:00 p.m.	Session 1: Transforming a core biology course Speaker: Jeremy Searle, Professor in Ecology and Evolutionary Biology	Introduction to Evolutionary Biology and Diversity (BIOEE 1780) is a required course for all biology majors, intended for students in their first or second year, with a class size of about 300 per semester. Over the last 8 years we have transformed the course to a fully active learning format, with both in-person and online versions. I will particularly focus on what we did in the early stages of the transformation, and the gains we made highlighting the enhanced inclusivity.
	Session 2: Versatile engagement: Layering complex design challenges through multiple narratives of expression Speaker: Jennifer Birkeland, Assistant Professor in Landscape Architecture	Designers must be versatile when it comes to communicating their work. Through the teaching of multiple applications, students can become better storytellers and more accessible to those outside of the discipline. Engaging students in the classroom with new tools helps them build their skills and their voices as advocates for the future.
	Session 3: Transforming discussion sections and accompanying TA training and support Speaker: Vida Maralani, Associate Professor in Sociology	Sociology's Active Learning Initiative grant transformed both lectures and discussion sections. In this talk, I will share a road map of how we trained our TAs to design interactive discussion section activities and a shared lesson plan that was used by all TAs each week. Using this approach we developed a bank of course materials that instructors and new TAs continue to use and is updated each term.
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