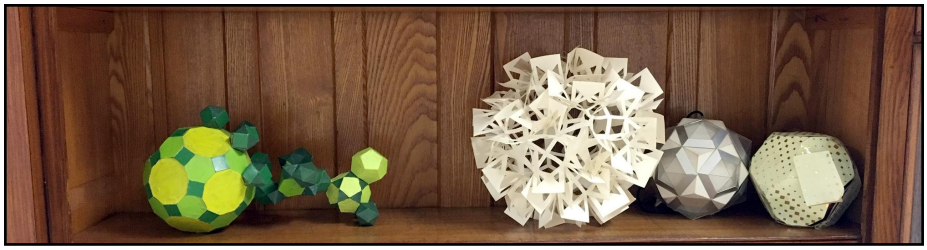

Teaching & Learning Miniconference

Department of Mathematics & Science

Friday, January 18th, 2019

Welcome to the first ever *Teaching & Learning Miniconference*! Thank you so much for participating today. It is our hope that by creating an informal, safe space where our faculty can share their teaching approaches, we can create a departmental culture that is focused on how to best meet the learning needs of our students. The only real guidelines for today's conference are to be curious and non-judgmental. What can we learn from how others teach? What do we have to offer that might help a colleague better foster student learning?

09:00 - 09:15 **Meet & greet, introduction**

09:15 - 09:30 Damon Chaky

Inviting students in: Surveys, prompts and resources to facilitate connection

In this presentation, I'll share a handful of techniques that I've been using to promote robust in-class discussions and greater engagement with course material. Specific techniques will include surveying student opinions and interests, devising writing prompts and low-stakes "no wrong answers" activities, providing clear organization of course materials around learning objectives/outcomes, and provision of feedback through the LMS. The presentation will conclude with a list of current library resources (e.g., "Teaching Naked Techniques" and "Small Teaching"--- both published in the last two years by Jossey-Bass) that provide additional thoughts on these techniques--- and many, many, others--- from a wide variety of STEM and non-STEM courses.

09:30 - 09:45 Peter Matt

Google Forms and Flubaroo Grader

Survey courses cover a wide range of material, making it difficult for students to know what is important. I use on-line quizzes as the basis for exams. This gives students advance notice of what I expect them to know and multiple opportunities to review the material. A third-party app called Flubaroo Grader automates quiz grading and distribution of results to students.

09:45 - 10:00 Eleonora Del Federico

X-Ray Fluorescence in Art

In this presentation I will show an example of a class activity that introduces through X-Ray Fluorescence concepts of electronic configuration and periodic table. Emphasis is made on the analysis of pigments, inks and paintings, but students are encouraged to bring their own objects and find out what they are made of. The advantages and limitations of the technique are a key point of discussion along with how to analyze the spectra and report scientific data.

10:00 - 10:15 Chris Jensen

Using adaptive multiple choice questions to turn testing into learning

Multiple choice questions are notoriously problematic as an educational tool. When students get the correct answer, it is hard to know whether that answer reflects true understanding. When students get the wrong answer, it is difficult to know "how close" students might have been to the correct answer. Despite these and other problems, multiple choice questions are also alluringly convenient to instructors and alluringly appealing to students. Is there a way to harness some of the benefits of multiple choice questions without

suffering from their many shortcomings? I will share how I use adaptive multiple choice questions as both a formative and summative assessment in my courses, and show how the adaptive format empowers the instructor to see where students are misunderstanding a concept and empowers students to improve their understanding simply by completing these multiple choice questions.

10:15 - 10:30 **Coffee break**

10:30 - 10:45 Mark Rosin

Experiential Physics Learning
Originating from the science-center sector in the 70s, hands-on learning or "making" has gained considerable traction as an inquiry-based method. This presentation will cover one simple light-based example of this practice made relevant to the interests of an art student.

10:45 - 11:00 Daniel Wright

Designing Spreadsheet Activities
I'll present on my continuing exploration of designing spreadsheet activities for practical math courses. The focus will be on a recent development of module in which students attempt to calculate what they might earn as a rideshare (i.e. Lyft, Uber, Via, Juno) driver, fitting into a larger attempt to offer a choice of activities that provide both useful skills and important insights that students can take directly into their adult lives.

11:00 - 11:15 Cindie Kehlet

The periodic table
In this presentation I will show the activity I do with the students on the first day of class in the course Chemistry of Pigments. Students are discovering the power of the periodic table through a guided activity and they will subsequently be able to predict physically and chemically properties for an element. They furthermore gain the understanding that the main group elements have predictably properties while the transition elements do not. We will return to the knowledge gained on the first day of class throughout the semester.

11:15 - 11:30 Helio Takai

Project based teaching
I will discuss a classroom format where students learn by executing projects. The course was offered at Stony Brook University for in-service and pre-service physics teachers, as well as advanced undergraduate students. I will discuss the positive aspects of the classroom format and how it could be implemented at an undergraduate level.

11:30 - 12:00 **Discussion & synthesis**
What do these presentations tell us about the state of teaching in our department?

We hope to keep the discussions generated by this miniconference going throughout the semester! Thank you so much for participating in this inaugural version of what we hope will become a tradition in our department.

- Helio Takai & Chris Jensen, organizers