Presenters and Abstracts:

Jesse Reich, National Learning Solutions Scientist, Sapling Learning (Friday)

21st Century Technology Infused Classrooms

Abstract: 100 years ago classrooms were revolutionized by textbooks and the speed with which information could be accessed. The same thing happened again a few decades ago as the internet allowed learners to access information at the click of a button for free. Today's students no longer struggle finding chemistry content; instead the limiting reagent in their progress appears to be applying content to problem solving. Many tools and approaches exist for professors to help students learn and to assess their progress. Here we discuss a variety of tools and investigate their efficacy.

Danae Quirk, University of Minnesota, Mankato (workshop Friday)

Building from Investment: Using the Flipped Classroom Model to Fuel Higher Level Learning

Abstract: Implementation of the "Flipped Classroom" instructional model coupled with various online learning resources drove student motivation and promoted accountability in this allied health chemistry course taught at Minnesota State University, Mankato. Once charged with specific learning goals, students obtained the requisite knowledge from online recordings (Tegrity) and interactive online activities (LearnSmart and SmartBook). Student engagement was enhanced by employing in-class active learning strategies. Student learning was regularly assessed using online homework (Connect) as well as in-class through the use of clickers, unit quizzes, and the ACS standardized exam.

George Kemper and Paul Orman, bhdp (Friday and Lab Walk-Through)

The Next Generation of Teaching Labs

Abstract: Student needs and learning styles are evolving, and teaching the resolution of real-world problems poses challenges to the traditional laboratory. Many institutions have not changed the traditional laboratory design, but can it be improved? This presentation will examine the forces driving the design of future of laboratory environments in the undergraduate experience and potential outcomes for future design consideration.

Doug Mulford, Emory University (Thursday)

ALEKS and the GCAT at Emory. Design and implementation

Abstract: This talk will focus on the use of ALEKS for a summer pre-test and remediation at Emory Universality in addition to implementation throughout the year. We have found ALEKS to be very effective at helping students be ready for college chemistry on day 1 regardless of their background training. In addition we have found the in-class implementation has fundamentally changed the course with student learning greatly increased even for the weakest students.

Michelle Driessen, University of Minnesota, Minneapolis

Meeting the Needs of Digital Natives (Friday)

Abstract: Our students are more digitally inclined than ever. This can be used to our advantage to make the learning process more transparent and flexible. Tips and ideas gathered from teaching a successful online introductory chemistry course and a reduced-seat-time blended general chemistry sequence will be discussed.

David Spurgeon, Director of Chemistry, McGraw-Hill (Thursday)

What if...? The Changing Face of Higher Ed Publishing

Abstract: The digital environment does more than provide a place to do homework. We explore ways to control college costs, reimagine the textbook, and provide an effective learning experience for students.

Haidy Kamel, Cuyahoga Community College, Cleveland, OH (Friday)

Addressing the Achievement Gap: Engaging Students in the Chemistry Classroom

Abstract: College classrooms exhibit a diverse student population with different academic backgrounds. One of the challenges in the chemistry classroom is the achievement gap between the highperforming and the academically struggling students. A variety of instructional strategies and classroom engaging practices are used to facilitate the academic success of all students. These include student-centered learning experiences such as in-class demonstrations, cartoons, games and more. The materials in this presentation come primarily from personal practices and academic articles.

Rajiv Narula , SUNY College of Technology at Canton (TBA)

Motivating a Diverse Group of Introductory Level Students in a Large Classroom

Abstract: Being an educator is not easy! One constantly struggles with a diverse group of students, some who are highly motivated, others who are not. The challenge is greater in a large introductory level course & the situation worsens if that course is Chemistry. How does one effectively teach facing these challenges? In my experience the best way is to connect to students the very first day. My first lecture incorporates effective techniques that I have learned in my own continuing education coursework. The results are phenomenal. My first lecture changes the "climate" of the classroom setting students up for success.

Luciana Aronne, Penn State Erie, The Behrend College (TBA)

Working with High School Students, The Pros and Cons

Abstract: For the past eight years there has been a pedagogical collaboration between the chemistry department at Penn State Erie- The Behrend College and Collegiate Academy, an urban college preparatory school in Erie, PA. The goal of this collaboration is to have students work with a faculty member on developing new laboratory experiments for the first year general chemistry laboratory curriculum sequence at Penn State Erie- The Behrend College. This talk will discuss the advantages and disadvantages of working with high school students in a college setting.

Dr. Zhihai Li, Department of Chemistry, Ball State University, Muncie, IN (TBA)

Effective Large Classroom Teaching at a Primarily Teaching Institution

Abstract: It is always a challenge to effectively teach in a large classroom at a primarily teaching institution, especially when you are a new faculty and teach students having very different background and pre-knowledge. In this presentation, we will discuss how to teach a university core course (General Chemistry) to more than one hundred students who come from different departments/majors and having different level of chemistry pre-knowledge and distinct cultural background using multiple approaches and strategies.

Regan Silvestri, Lorain County Community College (Friday)

Magical Science: Chemistry Magic Tricks Just for Fun! (workshop)

Abstract: Chemistry magic tricks are simply chemistry demonstrations cleverly performed, and are highly valuable for engaging and motivating students in the study of chemistry. Our agenda has been to adapt common chemistry demonstrations into presentations with clever twists, essentially turning them into magic tricks. This workshop will show how a science demonstration can be turned into a science magic trick simply by adapting the presentation. Science magic tricks provide a unique forum not only for expanding scientific knowledge, but moreover scientific interest. Our hope is that students will be engaged and motivated in the future study of chemistry.

Chris Bowers, Ohio Northern University (Friday)

High School Chemistry Teacher Workshop

Abstract: In June 2015 Ohio Northern University's Department of Chemistry and Biochemistry will hosted its 5^{th} annual High School Chemistry Teacher Workshop. The workshop is a weeklong residential workshop with a primary focus on laboratory activities and is held on ONU's campus. The participating teachers work with ONU faculty mentors to develop a personalized plan and set of goals related to participation in the workshop. This plan is developed prior to their attendance at the weeklong workshop to allow for maximum productivity during the lab portions of the program. The workshop program involves a mixture of various professional development activities including training on the use of probeware, lab exercise testing and development, discussions of laboratory safety, the challenges of teaching chemistry and the use of chemical demonstrations in the classroom. Each teacher receives one probeware unit for use at their school. In addition sets of probeware units are available to be rotated among the teacher participants during the following school year. The faculty mentors perform follow-up classroom visits to observe the implementation of lab exercises developed at the workshop.

Mark R. Watry, Franciscan University of Steubenville (Thursday)

Improving Scientific Thinking and Writing in the General Chemistry Laboratory

Abstract: We use many guided inquiry laboratory exercises and focus on making predictions (hypotheses) formulating molecular scale models, and reformulating the hypotheses and models as we collect data that test the initial hypotheses and models. The students keep a "formal" laboratory notebook. Almost every experiment requires the student to formulate a hypothesis that can be tested in the experiments we will perform. Questions at the end of each experiment suggest the items that should be included in a scientific discussion of the results. Over the course of the first semester we guide them through the process of keeping a good notebook and writing a complete report sans discussion. In the second semester we include discussions of the results and error analysis. Most experiments are conducted before the material comes up in lecture, and we see that the students are better prepared to benefit from the lecture. The students are also seen as better prepared for their subsequent science courses, whatever discipline they are in.

Jerry Mundell, Cleveland State University Anne O'Connor, Cleveland State University, Danae Quirk, University of Minnesota, Mankato (Thursday)

Open Forum: The Pros and Cons of Student Evaluations and Other Concerns

Abstract: Open discussion; Notes will be taken.

Anne O'Connor, Cleveland State University (Thursday)

Research Experience to Enhance Learning: REEL Chemistry Laboratory

Abstact: In contrast to traditional chemistry lab courses where students perform lab exercises and submit lab reports with a known outcome, the approach of the REEL method of lab teaching is to have students, work independently and collaboratively, develop, pursue and implement their own research projects. Since most of these students lack any sort of research background, guidance and instruction that include literature searches, instrument instruction, data acquisition, data analysis, and presentation of research results are provided for each of the projects. By the

end of the semester, each group of students present a poster of their research at a conference that exhibits both graduate and undergraduate research or at a regional American Chemical Society (ACS) meeting. The original research of students regarding such topics as arsenic and chromium content in wooden playground structures, tricolasan and phathalates in cosmetics, shampoos and other personal products, bioremediation of PAHs by plants and mushrooms, heavy metal concentrations in community gardens and brown field sites around the Cleveland area, lead concentrations in the vicinity of roadways, and the occurrence of polycyclic aromatic hydrocarbons (PAHs) in cooked foods, sealed coated parking lots, and motor oils as well as the toxicity of PAHs and heavy metals on plants and bacteria are presented. Instructing a REEL lab takes full commitment from both instructors and teaching assistants. Instead of a single traditional lab exercise each week, the activities of the REEL labs keep the instructor and two teaching assistants very busy. In the REEL labs, students quickly learn the importance of teamwork and collaboration. They develop critical and creative thinking that builds confidence as well as knowledge--all valuable skills in today's areas of research. Since these are original research ideas the students take ownership of their projects. In a traditional lab course the "experiments" are usually exercises with known outcomes. In REEL lab, since students are working on actual research projects, the outcomes are unknown. This provides the students with a sense of engagement, discovery and knowledge.

Anne O'Connor, Cleveland State University (Workshop Friday)

Tools of the Trade

Abstract: Workshop will focus on the production of instructional videos and other online support for students

Ghaffari Shahrokh, Ohio University (TBA)

Investigating the Relationship Between Student Performance and Average Time Spent on Chemistry Exams

Abstract: During an examination period, one can find students who take noticeably less time than average to complete the exam, as well as students who require more time than average to finish the exam. This study examined these two groups of students to answer the following:

1) Is the amount of time that a student spends taking an exam a habit?

2) Is there any correlation between examination scores and the length of time it took to complete the exam?

The results of the study answered both of the above questions. In response to the first question, of the students who took either more or less than the average examination time to complete their exam, twenty-five or higher percent were the same students each time. As these particular

students demonstrated a consistent pattern in how long it took them to finish from one exam period to the next, the results indicate that the time spent taking an exam is due to habit, where habit is defined as “A settled tendency or usual manner of behavior” (1). In response to the second question, the study shows that no significant and consistence correlation exists between examination score and the length of time it took to complete the exam.

Wine and Punch Social (Thursday 5 PM)

Time to relax and talk about teaching and other things