Chemistry Outlook

An Activity of
The Committee on Chemistry in the Two-Year Colleges
Division of Chemical Education
American Chemical Society

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Jason Jadin, Chair

INSIDE THIS ISSUE!
Vol. 2012 – Issue IV

Notes From The Chair

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Jason Jadin
Rochester Community and Technical College
Rochester, MN

I am writing my last "Notes from the Chair" article after attending the 2012 BCCE. It was the first BCCE that I have attended and I thoroughly enjoyed it. The conference began with Bassam Shakhashiri as plenary speaker. I enjoyed seeing him in person, since he first introduced me to the world of chemistry. Growing up in Wisconsin, I remember watching his chemical demonstration specials shown on the local PBS station. My sister and brother would laugh at me watching this 'silly' science show, but hey, it got me hooked. How did you get interested in chemistry? Was a childhood visit to a science museum, a chemistry lab kit received as a gift, or a great science teacher?

While I was always curious about how things worked, it wasn't until I was in high school that I really became interested in chemistry. I have to thank my high school chemistry, Mr. Flatten, for arousing my interest. He was a fun teacher, but our class could often get him off track by asking questions about how the football team would do that week (he was the JV coach) or asking how beer was made. The best thing about his teaching style was that he used a lot of chemical demonstrations in his lesson plans. To this day I still love watching chemical demonstrations. I don't know what it is - the colors, sounds, fire, etc. - but whatever it is I usually end up saying "wow that was pretty cool."

On one of those days when we got Mr. Flatten off-track, he mentioned that he took a short summer course on polymers at UW-Stevens

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Conference Calendar

2012-2013

198th CONFERENCE (Midwestern)
Sept. 21-22, 2012
Haper College
Palatine, IL
Contact: Dan Stanford
Email: dstanfor@harpercollege.edu

199th CONFERENCE (Western)
Nov. 9-10, 2012
Arizona Western College
Yuma, AZ
Contact: Scott Donnelly
Email: scott.donnelly@azwestern.edu

200th CONFERENCE (Southern)
April 5-6, 2013
Delgado Community College
New Orleans, LA
Contact: Tamika Duplessis
Email: tduple@dcc.edu

"Notes from the Chair" ...continued from page 1

Point. He also mentioned that he liked their chemistry department. I decided to check it out and ended up attending UWSP. It worked out that my general chemistry professors, Marv Lang and Don Showalter, also loved teaching through chemical demonstrations. They did at least one demonstration per week and tied the demonstration effortlessly into their lecture. The visual aspect made the lecture much easier to understand. They inspired me to become a chemistry instructor.

Now that I teach college chemistry, I have the opportunity to impact many lives. I don't have any wild visions of turning every student into a future chemistry major. I simply want to share my joy of teaching chemistry with them. Maybe twenty years from now they will remember my name and a "pretty cool" demonstration that I did.

As I close my final "Notes from the Chair", I would like to thank you for electing me and allowing me to serve in this capacity. I will serve three more years as Past Chair, with responsibilities as the Future Sites Coordinator, a position that will be vacated by Candice McCloskey-Campbell as she finishes out her term. I hope to maintain and build upon the excellent work that Candice has done with the conference schedule.

Thank you to all the members of the executive committee. Thank you to everyone who worked to make the conferences this year so successful. Thank you to all of you who entrusted the year to me and have read these "Notes from the Chair". I hope to see you at many more meetings in the future.

From the Editor:

This month we have a few different and interesting articles, with more to come next issue. First, Amy Jo Sanders introduces Olga Katkova from Western Nebraska CC to the 2YC$_3$. Olga describes her interesting path from Moscow to teaching in Nebraska on page 11.

A summary report on the Distance Learning Symposium at the 195th 2YC$_3$ Conf. at MiraCosta CC in March is presented on page 12, with the full report to be found on the 2yc3.org website! Interesting and important reading!

Finally, a very interesting note by Don Takehara of Taylor University in Indiana about using real-time telemetry and high altitude ballooning to engage and excite students. What Don has done is easily applicable to two-year colleges and even high schools. With the growing emphasis on reasearch in two-year colleges, this could be a fascinating way to get your students involved! See the article on page 14.

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American Chemical Society
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$2YC_3$ Membership Form

Please consider supporting the $2YC_3$ by becoming a member or renewing your membership. Annual dues are only **$25**.

There is no longer a special rate on joint membership with DivCHED. If you are interested in joining DivCHED, please go to http://www.divched.org/ and click the Membership link on the left.

I wish to: _____ Become a member of $2YC_3$
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I am a: _____ Two-Year College Teacher _____ Four-Year College Teacher
_____ High School Teacher _____ Other

Your Name: _____

Institution: _____

Address: _____
Street City, State 9-Digit Zip Code

Phone: _____ **Email:** _____

Current Member of: _____ ACS _____ DivCHED

Names of current members are posted on the $2YC_3$ website. The list includes names, institutional affiliation, and membership expiration date only. Email addresses and phone numbers are NOT listed. If you do NOT want your name listed, check here _____.

- **Secure electronic payments for membership dues now accepted. Select 'Membership Form' on the $2YC_3$ website to become a member.**
- **If paying by check, please send your check**, payable to $2YC_3$, for $25 to:
  Thomas Higgins, Harold Washington College, 30 E Lake St, Chicago, IL 60601

199th $2YC_3$ Conference

Conference Program

"Old Wine, New Flasks: Chemical Education in the 21st Century"

Arizona Western College
2020 South Avenue 8E, Yuma, Arizona
November 9-10, 2012

Program Chair: Scott Donnelly *scott.donnelly@azwestern.edu* 928 344 7590
Exhibits Coordinator: Francisco Villa *francisco.villa@azwestern.edu* 928 317 7080

Please note: The latest conference updates, registration and other information can be found at the $2YC_3$ website at: *http:2yc3.org/php/meetings.php*.

Friday, November 9, 2012

8:00 – 5:00 **Exhibits**
AS lobby (AS = Agricultural Science building)

8:00 – 9:00 **Registration, Refreshments, and Exhibits**
AS lobby

9:00 – 9:15 **College President's Welcome and Opening Remarks**
Glenn Mayle, President, Arizona Western College
3C Conference Center

9:15 – 10:15 **Keynote Address**
TBD
Peter Morse, Santa Monica City College, Santa, Monica, CA
3C Conference Center

10:15 – 10:45 **Refreshment Break and Exhibits**
AS lobby

10:45 – 11:25 **$2YC_3$ General Membership Meeting**
Jason Jadin,$2YC_3$ Chair, Rochester Community and Technical College, Rochester, MN
3C Conference Center

11:30 – 12:15 **Parallel Presentation Session**

A. TBD
AS-215

B. **TBD**
Francisco Villa, Northern Arizona University-Yuma, Yuma, AZ
AS-207

12:15 – 1:00 **Lunch Break and Exhibits**
3C Conference Center

1:00 – 2:35 **Workshop**
Resources for Excellence: Leveraging 2YC$_3$ and ACS Resources to Improve Student Learning and Faculty Effectiveness
Tom Higgins, Harold Washington College, Chicago, IL
Mary Leigh Poole, Holmes Community College, Goodman, MS

1:00 – 1:45 **Parallel Presentation Session**
A. **TBD**
Brad Bates, Chandler-Gilbert Community College, Gilbert, AZ
AS-215

B. TBD
AS-207

1:50 – 2:35 **Parallel Presentation Session**
A. **ACS: Partners in Supporting Excellence in Two-Year Colleges**
Amina El-Ashmawy, Collin College, McKinney, TX
AS-215

B. **NMR as a Quantitative Tool**
Donald Bouchard, Anasazi Instruments, Indianapolis, IN
AS-207

2:35 – 3:00 **Refreshment Break and Exhibits**
AS lobby

3:00 – 3:45 **Parallel Presentation Session**
A. TBD
AS-215

B. **TBD**
Paul Smolenyak, Yavapai College, Prescott, AZ
AS-207

3:50 – 4:35 **Parallel Presentation Session**
A. **An Open Discussion on Dual Enrollment in Chemistry**
Doug Sawyer, Scottsdale Community College, Scottsdale, AZ
AS-215

B. TBD
AS-207

5:00– 7:00 **Dinner Banquet and Address**
Strange Times on Planet Earth? Transformation of the Global Environment
Malcolm Hughes, University of Arizona, Tucson, AZ
3C Conference Center

Saturday, November 10, 2012

8:30 – 4:00 **Exhibits**
AS lobby

8:30 – 9:00 **Registration, Refreshments, and Exhibits**
AS lobby

9:00 – 10:00 **Opening Speaker**
TBD
Clemens Heske, University of Nevada Las Vegas and Karlsruhe Institute of Technology
3C Conference Center

10:00 – 10:30 **Refreshment Break and Exhibits**
AS lobby

10:30 – 11:15 **Parallel Presentation Session**

A. **TBD**
Tom Higgins, Harold Washington College, Chicago, IL
AS-215

B. **TBD**
Paul Haberstroh, Mohave Community College, Lake Havasu, AZ
AS-207

11:20 – 12:05 **Parallel Presentation Session**

A. **Teaching how we think instead of what we know**
Vicente Talanquer, University of Arizona, Tucson, AZ
AS-215

B. TBD
AS-207

12:05 – 1:00 **Lunch Break and Exhibits**
AS lobby

1:00 – 1:45 **Parallel Presentation Session**

A. **Chemical Relevancy in the Consumer World**
Scott Donnelly, Arizona Western College, Yuma, AZ
AS-215

B. TBD
AS-207

1:50 – 2:35 **Parallel Presentation Session**

A. TBD
AS-215

B. TBD
AS-207

2:35 – 3:00 **Refreshment Break and Exhibits**
AS lobby

3:00 – 3:45 **Parallel Presentation Session**

A. TBD
AS-215

B. TBD
AS-207

3:50 – 4:35 **Parallel Presentation Session**

A. TBD
AS-215

B. TBD
AS-207

Registration

Registration for faculty can be completed at the $2YC_3$ Meetings website: *www.2yc3.org/php/meetings.php*.

Registration for current and new exhibitors can be completed at the conference website: *www.2yc3.org/php/meetings.php*, click on Conference Website.

Lodging/Hotel Information

Special $2YC_3$ room rates are available at the following two hotels. Reservations must be made by October 25 to secure the conference room rate. Conference attendees are responsible for reserving and paying for their hotel room. The conference hotels provide complimentary on-site parking, breakfast, and airport shuttle service. If you encounter any problems with your reservation, contact Sara Gray directly at 1-928-783-7932.

Note: If you register through the hotel web site, you will be given the conference rate (tax = 11.4%) only if your check-in and check-out dates are within the range, Nov. 8 through Nov. 11 respectively. If your check-in or check-out date is different or falls outside this range, then call Sara Gray directly at 1-928-783-7932.

After entering your Check-In and Check-Out dates, No. of Rooms, and Guests/Room on the hotel website, go to Special Rates & Awards. Choose Group Code from the drop-down menu. Group Code = **AWCAWCA**

SpringHill Suites Marriott
1825 E. 18th Street, Yuma, Arizona 85365
Website: *www.marriott.com/yumsh*
Phone: 1-928-783-7853

Fairfield Inn Marriott
1801 S. Sunridge Dr. , Yuma, Arizona 85365
Website: *www.marriott.com/yumfi*
Phone: 1-928-345-180

Maps and Directions

Maps of the AWC campus and local dining establishments as well as directions from the airport to the conference hotels and to AWC are found on the conference website: *www.2yc3.org/php/meetings.php*, click on Conference Website.

Continued next page...

Rental Car Information

The two hotels are across the street from one another and located approximately 8 miles from the Arizona Western College (AWC) campus. A shuttle van operated by the hotels will be available for roundtrip transportation between AWC and the two hotels. But please be advised that the shuttle van has limited seating capacity (8 occupants) so you may have to wait (perhaps a long time) for a shuttle ride.

Rental car information is provided below should you want to potentially avoid having to wait for the shuttle van. The rental car agencies listed below are located at the east end of the passenger terminal, just opposite from the baggage claim area. The rental car "ready" parking lot is located just east of the passenger terminal. Below are the local and 800 numbers for your convenience.

Avis 1-928-726-5737 or 1-800-230-4898; *www.avis.com*
Budget 1-928-344-1822 or 1-800-527-0700; *www.budget.com*
Enterprise 1-928-726-9923 or 1-800-261-7331; *www.enterprise.com*
Hertz 1-928-726-5160 or 1-800-654-3131; *www.hertz.com*

Air Transportation

The Yuma International Airport has two commercial airlines providing service to and from Los Angeles International Airport (LAX) and Phoenix Sky Harbor (PHX). United Airlines (*www.united.com*) services LAX. U.S. Airways (*www.usairways.com*) services PHX.

Local Attractions and Things to Do

A video showing area highlights will be uploaded to the $2YC_3$ website. Stay tuned!

A comprehensive visitor's guide to the Yuma area can be downloaded at *www.visityuma.com*.

Also, the Yuma area has a myriad number of hiking trails. A local hiking guide can be downloaded at *http://virgil.azwestern.edu/~gjm/YumaTrails/YumaTrails.pdf*.

Family fun can be had at Waylon's Water World *(www.facebook.com/WaylonsWaterWorld*).

What's Happening in My Area?
News From the Regional Advisory Boards (RABs)

Midwestern RAB
Amy Jo Sanders, Chair

Greetings from the very dry Midwest! I am very much looking forward to seeing you at the 189th Conference at Harper College in IL. Dan Stanford and his committee have been working diligently to make this another successful $2YC_3$ event. Please encourage your colleagues to present or attend.

At this time I would like to inform you that, due to some extra duties I have accepted for $2YC_3$ and ACS, I will not be serving as the Midwestern RAB Chair for the next term. I would like to take this time to publicly thank my dedicated and driven board members. It has been a great pleasure to be able to serve in this position for the past 6 years. I would like to personally invite members of the Midwestern region to consider volunteering for this position. Please send your letter of intention to Jason Jadin at *Chair@2yc3.org*. I am also available to discuss the position or answer any questions you may have.

Editor's Note: This month Amy would like to introduce Olga Katkova from Western Nebraska CC. Please see the article about Olga in this newsletter entitled: "From Russia, With Love...and CHEMISTRY!" on page 11.

200th $2YC_3$ Conference
Call for Papers

Balancing the Instructional Equation: Tradition vs. Technology

April 5-6, 2013
Delgado Community College
615 City Park Avenue
New Orleans, LA 70119

We are currently looking for colleagues who would like to contribute to our program by giving a presentation, leading a workshop, or participating in panel discussions. We strongly encourage topics related to our theme "Balancing the Instructional Equation: Tradition vs. Technology" as well as other areas to give us a diverse program.

Please note: Latest conference updates will be available on the $2YC_3$ website as they become available.

Contact Program Chair:
Tamika Duplessis *tduple@dcc.edu*

You Can Be a Part of $2YC_3$

An Invitation for Submissions to the Chemistry Outlook

From the Editor: I would like to invite any and all members of $2YC_3$ to consider submitting interesting and relevant articles, commentary, announcements, job postings or photographs for inclusion into the Chemistry Outlook. *Do you have an interesting and relevant story to tell about your past $2YC_3$ experiences?* Do you have an interesting classroom activity you'd like to share? How about a demonstration or a teaching technique that you think works especially well? In the past we have published conference commentary, "It Works for Me", photographs of students excelling at presentations and workshop announcements.

I would ask that submissions be fairly short so that we can include more in the newsletter. Submissions may be published on an editorial appropriateness and space-available basis, and should by typed in Times New Roman font, single-spaced, 12-pt. I look forward to hearing from you!

Deadlines for submissions for 2013:

Issue I (due out mid-Jan 2013): December 15, 2012
Issue II (due out mid-April 2013): March 15, 2013
Issue III (due out mid-July/August 2013): June 15, 2013
Issue IV (due out Sept 2013): July 15, 2013

Call for applications for the office of *Newsletter Editor* of $2YC_3$ for the 3-year term 2013-2015

Application for Newsletter Editor for 2013-2015 must include:

A. Pertinent personal data such as name, college, job title, address, etc.
B. A brief statement of pertinent qualifications, signed by the nominee.
C. A statement indicating a willingness to serve, signed by the nominee.
D. A statement of support from an appropriate person in the applicant's school.

To be eligible to be nominated an individual must:

1. be a two-year college chemistry teacher
2. have been a dues paying member of $2YC_3$ a minimum of three years prior to nomination
3. be a member of DivCHED
4. have experience with or willingness to learn the basics of Adobe InDesign and Adobe Photoshop
5. be able to meet quarterly publishing deadlines of approximately mid-late February/March, June, July and December each year.

For more information on the Newsletter Editor duties and responsibilities, and benefits of being a COCTYC member, please contact the current editor, Jim Schneider, at ***newsletter@2yc3.org***.

-Applications must be received by the Chair no later than OCTOBER 1, 2012.
-The COCTYC will serve as a nominating/screening committee to generate a slate of candidates.
-Each $2YC_3$ member shall vote for one nominee per office and the candidate who receives the greater number of votes shall be declared elected.
-Ballots must be received by the Chair postmarked no later than 12/31/2012.

Call for applications for the office of *Chair-Elect* of $2YC_3$ for the year 2014

Application for Chair-Elect for 2014 must include:

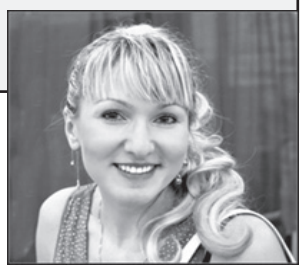
A. Pertinent personal data such as name, college, job title, address, etc.
B. A brief statement of pertinent qualifications, signed by the nominee.
C. A statement indicating a willingness to serve, signed by the nominee.
D. A statement of support from an appropriate person in the applicant's school.

To be eligible to be nominated an individual must:

1. be a two-year college chemistry teacher
2. have been a dues paying member of $2YC_3$ a minimum of three years prior to nomination
3. be a member of DivCHED
4. have demonstrated leadership and organizational ability by serving as Chair or Co-Chair for a conference and in one or more of the following capacities:
    a. served three years on the COCTYC.
    b. served as Program Chair, Local Arrangements Chair, or Exhibits Chair for a $2YC_3$ Conference.
    c. chaired a sub-committee of the COCTYC.
    d. contributed within the past three years two or more ways such as:
        -acted as local industrial sponsor coordinator,
        -chaired a conference section,
        -presented a paper at a conference,
        -moderated a panel at a conference,
        -other ways an individual has contributed

-Applications must be received by the Chair no later than OCTOBER 1, 2012.
-The COCTYC will serve as a nominating/screening committee to generate a slate of candidates.
-Each $2YC_3$ member shall vote for one nominee per office and the candidate who receives the greater number of votes shall be declared elected.
-Ballots must be received by the Chair postmarked no later than 12/31/2012.

From Russia, With Love...and CHEMISTRY!



My name is Olga Katkova. I am originally from Moscow, Russia where I grew up as the only child in a small family. Living in the world's most expensive city with the metropolitan population approaching 22 million, you do not always have a choice but to stay at your parents' tiny studio apartment. Yet that was my life in Russia. However, I was blessed with a childhood full of sports and hobbies, and my parents have always been my best friends.

Once I graduated from high school, I was determined to continue my education but I was not sure as to what I wanted to do. In the 1990s, business administration and affiliated sectors were the most appealing and fastest growing fields, and that determined my choice of the college. Four years later, in 1997, I graduated with a Bachelor's Degree in Marketing and started working for a pharmaceutical company. However, five months into my working experience I realized that I wanted to study chemistry and work in this professional field. And so, I entered one of the leading chemistry schools in Russia, the Mendeleev University in Moscow.

I successfully completed my studies in 2003 and was offered the opportunity to continue my education in the USA, that being enrolling in the graduate program in organic chemistry at Bowling Green State University, Ohio. Only the best students at my University received such an offer, so I proudly accepted it as recognition of my scholarly achievements.

I have to admit that it was hard for me at the beginning to cope with the graduate program while also struggling with my English. The classes were tough -- I was taking quantum chemistry and spectroscopy – and I had to study every single day. But for me, study involved not just reading books but, before that, translating almost every single word from lecture notes, articles and course books. And of course, I also had to memorize all the new words and terms.

I would lie if I said I never thought of quitting. I did. But my dear dad kept encouraging me; he used to say that one day my hard work would pay off. He was so right. The knowledge and experience that I gained as a Teaching Assistant at BGSU has proven extremely valuable, especially once I realized that a teaching career is what I want to do in my life.

For the last 7 years, I have been working as a Chemistry Instructor at Western Nebraska Community College, and I love everything about my job. Established in September 1926, Western Nebraska Community College is an extension of the University of Nebraska in Scottsbluff, Nebraska. Today, the College serves 12.5 counties in the Nebraska Panhandle offering credit and noncredit courses on its three campuses -- in Scottsbluff, Alliance, and Sidney -- and at various sites throughout Nebraska and neighboring communities. WNCC works closely with its donor communities to ensure that course offerings meet the educational needs of the students and employers in the area. This summer, we are remodeling the WNCC science department. It is a huge undertaking and we all are excited to see the final results.

I feel blessed to be a part of the WNCC family. Yes, here we are a family and I have learned the full extent of the togetherness that we share when I was going through a battle with bone cancer in 2006-2007. I underwent 13 months of aggressive chemotherapy but have never stopped teaching. The support from my students and colleagues kept me going even when the times were really tough. The end of the chemotherapy was not the end of my battle with cancer, however. When trying to save my leg, I endured 3 years on crutches and went through numerous surgeries. I believe that my survival made me a better teacher because it opened my heart to compassion and love and helped me understand other people better.

I love my job, and the most amazing part of it is my students. Many of them have full time jobs, busy schedules, families, kids and so on. All of them have amazing life stories. They are brave and determined when pursuing their dreams. I respect and admire every single of them and I have learned a lot from them. I believe that we are all teachers and students for each other. I believe that I am able to help students learn difficult concepts of Chemistry by patiently guiding them through the learning process. I understand that students at a Community College may have limited background in science, and I am willing to devote my career in sharing my knowledge with these students.

Distance Learning – the Final Teaching Frontier? A Symposium with Experienced Chemical Educators in Distance Learning – A Summary Report

Lance Lund, Anoka-Ramsey Community College, Coon Rapids, MN; Kathleen Carrigan, Portland Community College, Portland, OR; Bernadette Harkness, Delta College, University Center, MI

Abstract:
"Innovations in teaching chemistry" certainly describes the efforts applied to distance learning in undergraduate chemistry courses. This report summarizes the information shared at the distance learning symposium presented at the 195th $2YC_3$ conference at MiraCosta Community College in March 2012. This symposium consisted of two presentations and one panel discussion with chemical educators sharing their experiences and ideas regarding assessment, best practices, technology tools, and delivery methods of hands-on lab experiences. The sessions highlighted two different modalities for offering hands-on experiences for laboratory activities so that educators could decide for themselves their own preference for offering distance learning chemistry labs. The panel discussion allowed for presenters and participants to discuss further aspects and challenges of chemistry courses presented for distance learning. A full report and appendix of supplementary material can be found in the $2YC_3$ archives at ***http://2yc3.org***, or directly at this link:
http://www.2yc3.org/Archives/195/Full%20Report%20for%20Distance%20Learning%20Symposium%20195th%202YC3.pdf

Introduction:
Chemistry has followed other academic disciplines into the distance learning environment and with the breakneck advances in technology and new web tools, increases in online chemistry course offerings have followed. For those new to online teaching there can be a steep technological and pedagogical learning curve since the face-to-face (f2f) teaching and learning process differs greatly in an online format. The generally asynchronous nature of distance learning must provide for alternative methods of presenting materials for student engagement, communication and assessment while maintaining the checks that support academic honesty. Moreover, a laboratory component is an integral part of the learning process and the American Chemical Society (ACS) advocates for hands-on laboratory learning experiences over computer-simulated activities[1].

Online Lectures:
Learning chemistry content in an online format serves the student by allowing them to access the material at a time of their choice and to absorb it at their own pace. The greatest difference for online classes is to incorporate and maintain the communication and engagement in learning that occurs in the f2f classroom. Traditional textbook readings and problems through online homework systems were assigned and short video recordings for difficult lecture topics and worked out solutions were also available for the students to see and hear the logic of chemistry problem solving. Camtasia and Camtasia Relay software were used to produce videos. The use of virtual office hours or synchronous online help sessions was important for students to ask questions and gain feedback. This was especially effective when student attendance was a requirement for a certain number of sessions. Adobe Connect and Collaborate were two web conferencing tools that were used to facilitate this activity.

Assessment:
Since most assessments were given online, including homework as well as quizzes and semester exams, one of the main concerns is the integrity of the assessment process. A suggestion to encourage academic honesty occurred through syllabus quizzes reflecting integrity statements by students. For example, prior to taking any online quizzes or exams, students were required to achieve 100% grade on a one-time syllabus quiz where they are obligated to type in word-for-word statements from the syllabus like "I will use only permitted materials…." etc. As well, short but doable time limits for online quizzes or tests could be used to severely restrict use of outside materials. Using creative quiz questions that would not be searchable also helped to keep students honest. For example, questions like "if chocolate with symbol **Ch** was similar to calcium, what would the chemical formula for chocolate nitrate be?" was used instead of conventional naming questions. Another strong recommendation was that acceptable proctors administer a paper final exam. As well, the final exam grade was compared to the average of the semester tests. If the final exam grade was ~20% or more lower than the average of the semester exams, then the student may be required to retake the online semester exams in a proctored setting. Finally, a passing grade on the final exam was another gateway for successful completion of the course.

Hands-on Lab experience:
As part of the complete distance learning course and to follow ACS recommendations for a hands-on laboratory component[1], the presenters each gave different means to deliver the laboratory activities. One option was the use of an in-house developed lab kit with a core set of chemical lab equipment, with additional items to be purchased by the student. The other option was a commercial lab kit complete with all items. For both, the safety, affordability, and learning outcomes were considered so that the student would have as much of an equivalent learning experience as possible as in the on-campus laboratory.

Safety is a primary concern since the inherent supervision by the instructor is not available. Both presenters had mandatory safety lectures/videos and quizzes with high minimum scores as an entry for access to the lab exercises. The commercial lab kit manufacturer offers its own safety video and assumed liability of any effects from its lab kit. Other safety videos are also internet-accessible.

In-House Lab kit:
Lance Lund, with the help of chemistry stockroom personnel, presented an in-house prepared lab kit, which included a list of durable items (returnable equipment such as a digital balance, temperature probe, etc) and consumable items (chemicals used then discarded) that would be included for student purchase. The list also included general grocery store items that the student would provide. To keep costs to the student down, the kits were sold for a $75 purchase price and if returned with the durable equipment intact, the student would receive a $50 refund. Liability was not addressed in this development but no issues were reported. Examples of laboratory exercises that could be carried out with the in-house kit are listed in the full report but represent typical introductory exercises to explore graphing, density, thermochemistry, and stoichiometry.

Commercial Lab kit:
Kathy Carrigan presented her experiences of developing a hands-on lab experience in collaboration with a commercial lab kit vendor, Hands-On Labs Inc. (*http://www.labpaq.com/*). While at a higher cost (~$200) the custom lab kits contained all items including standard glassware and equipment. The commercial lab kit was non-returnable but the vendor also assumed liability of its product and has reported no safety issues with this product. The kit activities demonstrated how density/measurement, synthesis of esters, caloric content of food and the extraction of DNA could be carried out by a student with a home lab kit. A schedule of lab exercises for general and organic biochemistry and introductory chemistry courses is found in the Appendix of the full report.

Successful Practices for Distance Learning Lab Exercises
Suggestions included: weekly lab assignments with generous but firm due dates, allowing 1 or 2 lab assignments to be dropped, giving videos as pre-lab lectures or setting up instructional online sessions to promote communication and answer safety questions, encourage collaboration among students and require unique lab reports that included photo or video evidence (with date stamps) of student work.

Transitioning from On-campus to On-line: Tips for success
1) Start early (~6-9 months) and have entire course materials prepared before start of the class. Research LMS features or software for online delivery, video technology or resources, and attend distance learning workshops for new teaching/learning techniques.
2) Establish support for instructor from mentors, instructional designers, distance learning support personnel and online resources. Use student beta testers for feedback and modifications. Establish support for students so that they know where to seek help from distance learning support personnel and online resources.
3) Allow for extra student response time and establish clear guidelines including response times for feedback. Use synchronous online help sessions for problem solving and immediate feedback activities.
4) Use tables to show unit cancellations for dimensional analysis solutions as shown in the full article online.

Acknowledgements:
The authors wish to acknowledge and thank the ACS Office of Two-Year Colleges for travel funds to support this symposium. In addition, many thanks go to the co-panelists Carmela Byrnes and Jim Julius from MiraCosta Community College for their participation as well as the $2YC_3$ organizers from MiraCosta Community College. Lastly but not least the help of the student volunteers particularly Russell Kellogg, for the hands-on demonstration is gratefully acknowledged.

Reference:
1. ACS position statement: Importance of Hands-On Laboratory Activities - see pg. 13 of the *ACS Guidelines for Chemistry in Two-Year Colleges* at http://www.acs.org/2YGuidelines.

High Altitude Ballooning with Real-Time Sensors for Engaging Students

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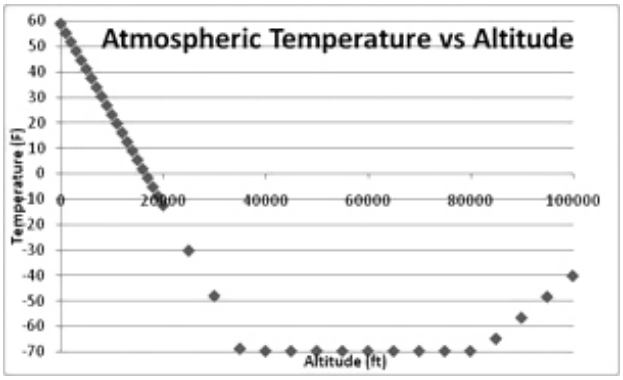
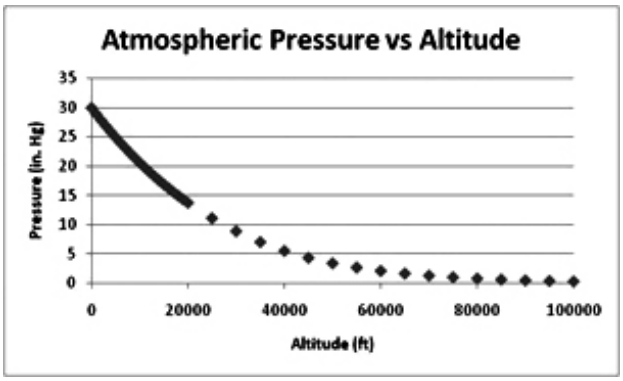
High Altitude Balloon with Student Experiments in Pods

Watching the experiment made with your own hands launched by a High Altitude Balloon and receiving data in real time as it ascends into near space - this is the thrill that Taylor University undergraduates have experienced over the last ten years. The launch, though, is only part of the excitement. Students are engaged in the full scientific method of formulating a hypothesis, developing and performing an experiment to test the hypothesis, analyzing the data, drawing conclusions, and reporting their findings. Since the experiments are original and balloon launches are unpredictable, students learn about the real-world obstacles that are overcome through flexibility, inquisitiveness, innovativeness, and persistence. Quantitative assessment shows statistically and practically significant gains in student intrinsic motivation, valuing science, application knowledge, metacognitive processes, cognitive skills, and content knowledge. The assessment included an instrument (pretest and posttest taken by the students) that was tested for reliability and validity. A One-Way ANOVA Repeated Measures was used to assess the changes from pretest to posttest.[1,2,3]

Salton Sea from Balloon at 85,000 ft with UC San Diego Aerospace Engineering

Taylor University's High Altitude Research Platform (HARP), with sensors that stream data in real time, uses a high altitude balloon to send student experiments 20 miles into the stratosphere. The balloon is tracked and recovered after it bursts and descends to earth. At maximum (near space) altitude, the blackness of space is visible along with the earth's curvature, thin layer of atmosphere, and features below. Temperatures to -60°C, and pressures to 0.01 atm are obtained along with high UV, high cosmic radiation, and widely varying humidity. Sensors sending data to earth every few seconds include temperature, pressure, altitude, humidity, UV, IR, CO_2, visible light, Geiger counter, and video cameras. Examples of topics used in chemistry courses include freezing point depression, ideal gas law, greenhouse gases, and UV radiation. Taylor University has experience implementing HARP into undergraduate general education chemistry classes and high school AP chemistry classes which should be





transferable to 2-yr colleges. Besides chemistry, HARP can be used in other STEM courses such as astronomy, meteorology, physics, engineering, mathematics, biology, earth science, computer science, etc.

Over the last 5 years, 70+ universities were trained to implement HARP into their undergraduate courses. StratoStar Systems, LLC was started up to provide turnkey balloon systems so faculty can focus on teaching course content while spending minimal time with the mechanics of the balloon launch and data acquisition. This could be achieved by institutions purchasing their own balloon system or by having experienced universities do the balloon launches. Currently, there are many universities implementing High Altitude Ballooning into their classroom as evidenced by the annual Academic High Altitude Conference that had fifty participants and over 30 papers and presentations this past June. Taylor University, with the help of a NSF grant, continues to help higher education institutions implement HARP into their courses. HARP has also shown to uniquely engage K-12 students. Effort is underway to extend HARP to high schools, middle schools, and elementary schools.

Please contact Don Takehara (*dntakehara@taylor.edu*, 765-998-4606) if you would like more information. A presentation on HARP will be given at the 198th $2YC_3$ Conference on September 21 at Harper College in Palatine, Illinois.

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[1] Steve Snyder, Bethany Smith, Rachel Tomasik, "Problem-Based Learning Using HARP Instruction," 117th ASEE Annual Conference and Exposition, 2011.

[2] Donald Takehara, Steven Snyder, Travis Booth, Elise Romines, Bethany Smith and Rachel Tomasik, "Developing High Altitude Balloon Curriculum for Undergraduate Courses – NSF Grant Impact and Example in General Education Chemistry," Paper and Presentation at the 2nd Academic High Altitude Conference, Iowa State University, June 22-24, 2011.

[3] Don Takehara, Jeff Dailey, Sue Gavin, Steve Snyder, Bethany Smith and Jason Krueger, "High Altitude Ballooning in High School Science Classes," Paper and Presentation at the 3rd Academic High Altitude Conference, Trevecca University, June 27-29, 2012.

Applications Are Being Accepted for The Dorothy and Moses Passer Education Fund Sept. 1, 2012 Deadline!

This Fund was established by a generous donation of Dorothy and Moses Passer. Moses (Mike) Passer was for many years the head of the ACS Education Division. The Fund provides grants for teachers at two- and four-year colleges or universities that do not have any advanced degree programs in the chemical sciences. The awards support continuing education activities that must be directly related to the applicant's teaching and must take them away from their campus. The applicant must be a full time faculty member at his or her institution. The applications are reviewed by a committee.

There is no application form but the application must include a description of the proposed activity and how it relates to his/her teaching with dates, locations, titles and contacts; a brief description of the applicants institution and department; a short curriculum vita; an itemized estimate of expenses, amount of aid requested and sources of all supplemental funds. No support will be given for general attendance at national, regional or local ACS meetings or for any sabbatical support.

Closing dates are three times each year: **January 1**, **April 1**, and **September 1**. All applications must be received electronically. For further information or inquiries contact Sue Nurrenberg. Email: **nurrenbe@purdue.edu**.

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