Who needs test tubes? Chemistry students devise a new learning tool

IU Northwest students recognized by website Mathematica for their creative use of mathematics software to demonstrate concepts in chemistry

A common depiction of a chemistry classroom might include students in lab coats and goggles, surrounded by beakers, balances and Bunsen burners. But in today’s technological learning environment, chemistry is also taking students into labs lined with computers in addition to test tubes.

That’s where seven students of Nelson DeLeon, Ph.D., associate dean for Arts and Sciences and chair of the Department of Chemistry, Physics and Astronomy at Indiana University Northwest, created an interactive learning tool that has earned accolades and a permanent place on the Mathematica website under what is known as the “Wolfram Demonstration Project.”

As part of his Physical Chemistry (C361) course in Fall 2012, DeLeon challenged his students to learn Mathematica -- software that enables researchers to solve and illustrate complex mathematical manipulations -- and apply it to a chemistry-related problem.

After completing some homework assignments to help them learn their way around the software, the students decided to use it to create a visual tool to help beginning chemistry students understand a basic chemistry concept known as “limiting reagents.” The students built a computer model that users can manipulate to help them visualize the effects of a limiting reagent during the formation of a product, such as water formed from hydrogen and oxygen, given varying amounts of reactants.

Sameera Raziuddin, a senior chemistry and pre-med student, said the group wanted to develop something that students could interact with in order to supplement their lessons in limiting reagents.

“If you don’t understand that in basic chemistry,” she said, “it is really hard to build on that. We wanted to show something that beginning students can use to understand.”

The students submitted their project, “Limiting Reagent for the Reaction of Hydrogen and Oxygen to Form Water,” to Mathematica’s website, continued on following page
where it will reside permanently. It appears that their project tapped into previously uncharted territory, DeLeon said, as the inventory of demonstrations on the site is heavy on physics and mathematical concepts, but had nothing pertaining to the application of Mathematica to chemistry concepts.

“The students’ project is the first one,” DeLeon said, “and this resource is something that is used across the country by students all the way up to the highest caliber of researchers.”

“The Wolfram Mathematica program itself is cutting edge....For us to use it in a way to help introductory chemistry students use this complex system in an easy way is noteworthy.”

-Nick Miljevic, Senior Chemistry Student

DeLeon said that learning applications like Mathematica is fast becoming a necessity as applications like it join mainstream science. That’s a good trend for many reasons, he said. Programs like Mathematica help take the mathematical tedium out of projects and let creativity flow more freely. Also, he said, such applications can take the edge off of chemistry for students who aren’t as strong in math.

Nick Miljevic, a senior chemistry major, said this project served as his first exposure to computer programming.

“The Wolfram Mathematica program itself is cutting edge,” Miljevic said. “It is probably one of the newest mathematical engines where you can plug in formulas or functions and get outputs. For us to use it in a way to help introductory chemistry students use this complex system in an easy way is noteworthy.”

Senior David Dimitroff said the Mathematica project was an exciting opportunity for the students to unite as a class and pool their strengths to achieve the published product.

“From idea generation to programming to the final visual touches, our success would not have been possible without the effort of the entire team,” he said. “We are all proud of the work and hope that it will benefit chemistry students who are learning about limiting reagents. We also hope that the project reflects well the mission of IU Northwest to advance knowledge and learning through scholarly work and research.”

The students in Physical Chemistry (C361), who now can include their published research on their resumes, are: David Dimitroff; Christopher Hilbrich; Igbal Michael, Nicholas Miljevic; Nabeela Mohideen; Sameera Raziuddin; and Kelly Stanley.
Medical students honor cadavers at memorial service

The IU School of Medicine - Northwest hosted a memorial service in January in honor and recognition of the six anatomical donors who selflessly gifted their bodies to scientific learning. In this program, family members of the donors were invited to an annual memorial service, coordinated by the first-year medical students, which provides student doctors, faculty and staff the opportunity to express their thanks for the gifts of the donors.

Above: Donors who served in the military received proper honors from MSIII Cadets Andrew Laud and Christopher Staff of the IU Northwest ROTC, also pictured at bottom left.

Top left: Lucyna Drozd-Nurek, Ph.D., William A. Scales, and Michelle Hynes participated in the service.

Left center: Medical student Neil Shah honors a donor.

Bottom left: Laud and Staff prepare an American Flag to present to a donor’s family.

Below: The Rev. James Wetzstein of Valparaiso University conducted the service along with Ernest Talarico, Ph.D., IUSM-NW associate professor of medical education and course director of human gross anatomy and embryology.
In the late 1980s, just prior to the tumultuous times that dismantled Yugoslavia, Zoran Kilibarda, Ph.D., and his wife, Vesna Kilibarda, Ph.D., were young scholars at the University of Montenegro. Now both associate professors at Indiana University Northwest, the couple in 1987 moved to the United States on a Fulbright Scholarship received by Vesna, a mathematician. The life journey that commenced with that prestigious trip to the U.S. has now come full circle, with Zoran returning home after 30 years on a Fulbright Scholarship of his own.

During the Spring 2013 semester, Zoran will teach Introduction to Geology and Geomorphology at the University of Montenegro and will conduct carbonate research for the Montenegro Geological Survey.

Established in 1946 under legislation introduced by then-Senator J. William Fulbright of Arkansas, the Fulbright Scholarship is one of the most prestigious academic honors worldwide. It is an educational exchange program sponsored by the U.S. Government that began as a way to foster understanding between the people of the U.S. and that of other countries.

For the Kilibardas, Zoran’s appointment holds greater significance than just a nod to his academic distinction. The opportunity is also a chance to give back to his native community -- to assist in an academic reconstruction of sorts. War and unrest had resulted in an exodus of bright minds from many European countries as residents escaped the crashing economies, Zoran explained.

“I feel obliged. Why not help these young people get a little more and maybe open the door for some of them to come to the States?” - Zoran Kilibarda, Ph.D.

Humble beginnings

When the Kilibardas first moved to the U.S. and Vesna began her academic pursuits at the University of Nebraska, Zoran manufactured windows, stocked a grocery store and even delivered pizzas during those lean times, as both tried to find their way in a new country with two young children.

A geographer with his own scholarly ideas, Zoran wanted to learn. Not yet a graduate student, he asked a professor if he could attend classes, anyway. The language barrier made it difficult to learn, but he persevered and caught up quickly. He even volunteered in a couple of research labs on campus.

“They accepted me with very low scholarship but I didn’t mind,” he said. “I would rather be in school.”

Finally, in 1990, Zoran was formally accepted into the University of Nebraska’s graduate school, where he studied geology. Both Kilibardas earned their doctorates in Nebraska and they had intended to return home. Meanwhile, the unrest in their home country had escalated and they quickly realized that “the country was falling apart.”

“We were both getting our Ph.Ds at the peak of war and unrest,” Zoran remembered. “We knew there was no way we could go back.”

By the time the war ended, Zoran said, their children were ready to begin college and had forgotten their native language. Returning to Europe for their children’s education would have been difficult, so the family stayed. Hence, a bright future in American academia was born and flourished.

The family spent five years in Alaska before settling in Northwest Indiana and beginning their careers at IU Northwest in 1999.

In 2004, the Kilibardas finally returned to visit their families, but their desire to return home permanently had waned as their careers solidified at IU Northwest.

In 2011, the Kilibardas tested the idea of returning home to teach by participating in an Austrian program that sought to bring native scholars back for one week per semester. During that summer, both Zoran and Vesna conducted short seminars at their native university.

He said the experience was rewarding and that the students there had impressed him.

“I feel obliged. Why not help these young people get a little more and maybe open the door for some of them to come to the States?” Zoran said. “I want to share my experience and tell them that if you are going to work, the doors are open.”

Vesna has flexibility in where she chooses to reside during Zoran’s appointment, since she will teach online courses at IU Northwest from whatever desk she happens to occupy. Zoran will return in time to teach during the Summer II session in 2013.
Indiana University Northwest recently announced the university’s new Chancellor’s Professorship, a special academic honor that will be given to two senior faculty colleagues in its inaugural year.

Professor of English George Bodmer and Professor of Fine Arts David Klamen will begin their appointments on January 1. They will hold the rank of Chancellor’s Professor throughout their careers at IU Northwest.

The Chancellor’s Professorship is intended to recognize senior faculty colleagues who have achieved the rank of professor and consistently demonstrate “highly meritorious performance in all areas of faculty work: teaching, research or creative activity, and service.”

“Their careers and commitments at IU Northwest clearly place them in the exclusive company that the titled rank of Chancellor’s Professor defines, and set a challenging standard for future nominees,” said Chancellor William J. Lowe in announcing the honors.

Lowe elected not to choose between the two finalist nominees, Bodmer and Klamen, but decided to recognize both longtime IU Northwest faculty members.

“Based on their applications, it is very difficult to make a meaningful distinction between the two candidates,” he said. “They both have made comparable contributions in their respective fields, both have very strong records and reputations in teaching and student growth, both cross disciplinary boundaries to achieve high levels of integration and integrity as creative teacher-scholars and both have exercised the requisite leadership among faculty colleagues, in service to IU Northwest and the quality of our students’ academic experience. Both candidates have devoted their academic careers to IU Northwest and are outstanding representatives of our fine faculty. It says something about the depth of faculty talent and commitment at our campus that we have two such teacher-scholars among us.”

Bodmer joined the university in 1982 and has taught professional writing, American literature, and children’s and adolescent literature in the English Department. Most of his research has been in the field of children’s literature, specifically on illustrated texts. This academic interest is matched with his work as a printmaker, and he frequently exhibits in Chicago, where his work is currently on display in two shows.

Bodmer has been active in the field of children’s literature, having co-edited one of the major journals in the field, The Lion and the Unicorn, published by Johns Hopkins University, as well as presenting papers here and in England on illustrated texts. He has also published articles on artists such as Maurice Sendak, Walter Crane and Bruno Munari.

Klamen joined IU Northwest in 1985, embarking on twin careers as exhibiting artist and teacher of drawing, painting, fundamental studio, and art theory. He also serves as Associate Dean in the College of Arts and Sciences and as the Chair of the Departments of Fine Arts and Performing Arts.

Klamen is an accomplished international artist and is represented by Richard Gray Gallery in New York and Chicago, and Mark Moore Gallery in Los Angeles. His artworks are exhibited in the collections of the Metropolitan Museum of Art, New York; the Los Angeles Museum of Contemporary Art; and the Museum of Contemporary Art, Chicago; among others.

“I am thrilled and honored to have been named Chancellor’s Professor,” Klamen said. “It is an exciting time both for me and in many ways for IU Northwest. The campus has demonstrated a strong and consistent commitment to growing and promoting academic excellence on campus, and I’m thrilled to be a part of it.”

The idea for the Chancellor’s Professorship originated with Executive Vice Chancellor for Academic Affairs David Malik and was heartily endorsed by the Faculty Organization.

Lowe said that the demanding requirements for the Chancellor’s Professorship program are intended to identify and recognize faculty colleagues who “contribute in concrete, demonstrable ways to the development of IU Northwest as an academic community of exceptional quality and integrity, as well as their disciplines, through the creation and application of knowledge.”
Indiana University Northwest students have a number of resources available to them through the university’s OneStart system, such as the ability to view their latest grades and unofficial transcript, keep up with their financial aid tasks, and even chart their courses for upcoming semesters.

Students who enrolled at IU Northwest in Fall 2010 or since now have another tool at their fingertips to help them track their academic progress in greater detail. Effective immediately, those students who log into their OneStart accounts can begin using tools under the tab, “My Academics and Grades.” These tools include: “View My Advisement Report” and “What if Advisement Report.”

In “View My Advisement Report” students who have enrolled since Fall 2010 can see how their courses, transfer credits, tests and other special credits apply toward the academic requirements of their major. In “What if Advisement Report” they can choose scenarios and evaluate how their current classes fit into an alternate plan of study.

“Though face-to-face meetings with an academic advisor remain an invaluable asset, the new tools in OneStart provide 24/7 access to information not previously available unless a student had an advising appointment,” said Mary Beth Mitchell, the research analyst/programmer who programmed the tool for each of the degree programs. “These tools essentially enable students to run their own degree audits without having to make an appointment with their academic advisors.”

However, Mitchell said it would be beneficial for students to see their advisors first for initial instruction on how to use the online degree audit tool.

The online degree audit is a kind of virtual checklist, Mitchell said, but the bonus is that it can be altered to help the student imagine and plan for various academic scenarios. A student can simulate a program of study and compare how the requirements for various degrees match up with courses already taken.

“You may be thinking of changing your major and wonder how that change would affect your progress,” Mitchell said. “You can use this component to request a simulated, or ‘what if,’ advisement report based on an alternate program of study.”

To do this, first create a career scenario, then a program scenario, and, optionally, add courses from the online catalog. Next, submit the request and then review the online audit to consider how the classes fit into your simulated degree program.

The features are now available for all undergraduate degrees and will soon be available for minors, certificates and graduate degrees.

Deciphering transfer credits is a bit trickier, Mitchell said, and learning how they transfer into a particular major may still require the help of an advisor who would have to input the credit.

For training on how to use the OneStart tools to manage your degree progress, contact your academic advisor.

IU NORTHWEST IN THE NEWS

Indiana University Northwest appears in the news on a daily basis. For a recap of some of those news stories featuring IU Northwest faculty, staff, students, and academic programs, please visit the media coverage section of the Office of Marketing and Communications’ web pages, accessible here.

FACULTY & STAFF UPDATE

Please welcome the following individuals who recently joined the IU Northwest campus:

- Sheila Trzcinka, School of Education, Special Education Instructor
- Lawrence Brewerton, Psychology, Adjunct Faculty Member
- Susan Woods, Radiologic Sciences, Adjunct Faculty Member
  - Karen Warner, Social Work, Visiting Lecturer
- Dawn Samson, SPEA, Graduate Program/Outreach
ALUMNI SPOTLIGHT

Business school alumna carves career niche

Stephanie Pierce is her own boss, and has a firm hold on a unique market

Indiana University Northwest alumna Stephanie Pierce took a winding road through college, and ended up on a career path almost as unique as her journey to her degree.

Then a single mother who had returned to school after a hiatus, the Valparaiso resident worked full-time while taking classes and raising children. Working her schedule around all that, she admits, was “pretty interesting.”

At first, Pierce set her sights on pre-pharmacy but quickly realized that wasn’t the right path for her and swiftly changed course. A positive experience in an economics class steered her in another direction and she wound up as a business major, graduating in 2009 with a Bachelor of Science in Financial Information Systems.

For the next 18 months, Pierce pondered her future while staying at home with her sons and step-son, who are now 16, 11 and 5.

“When I was staying at home with kids … I got to the point where I thought I couldn’t do anything,” she said. “Here I was, at home all the time. It kind of makes you think that you are never going to do anything again, but it wasn’t the case at all.”

She kept her head up and, eventually, her business savvy and networking paid off. When Pierce did rejoin the workforce, she expected to sit behind a desk and work for someone else. “But it turned out much better than that,” she said.

A family friend who was looking to retire began talking to Pierce about taking over his rather unusual practice. This coincided nicely with her fresh business education. Pierce now owns that business, called Human Resource Solutions, Inc., QDRO Services. As the sole proprietor, Pierce works with divorce attorneys to prepare Qualified Domestic Relations Orders (QDRO) for their clients.

When it comes to separating the finances of divorced couples, things can get pretty sticky. A plethora of rules, regulations and federal laws muddy the waters when it comes to dividing pensions, 401K plans and the like when couples get divorced.

That’s where Pierce comes in. She is well-versed in all of the rules and writes the orders, under the direction of an attorney, that will dictate how and when the parties will get their fair share, and in what amounts.

When it comes to making sure that no stone remains unturned in the business of allocating what clients are legally entitled to, it appears that Pierce is the only game in town. There are only a handful of companies that provide this service to attorneys in the U.S., she said.

Pierce, who resides in Valparaiso with her sons and husband, Christopher, is looking toward law school and plans to grow her business, something for which she believes her IU Northwest business education has prepared her well.

Looking back on her own journey, Pierce offered some advice to current students.

“I can do anything I put my mind to and so can you. Your limitations are what you make them. … If you think that you can, well, you probably can.”

-Stephanie Pierce
Retirees Honored

The colleagues and families of retiring staff and faculty members gathered on campus recently to recount fond memories and show appreciation for the three individuals who are leaving the campus and beginning a new chapter in their lives.

The retiring individuals honored at the reception included: William Buckley, Ph.D.; Juan (John) Gonzalez; and Linda Rooda, Ph.D., RN. Buckley, Professor of English, joined the Northwest campus in 1982. Gonzalez joined the campus in 1991. Rooda began at IU Northwest in 1972 and during her 40 years of service, she served as the Dean of the School of Nursing as well as Chair of the Faculty Organization. Buckley was not present at the reception.

Read the full story here.

Shop with a Cop

In preparation for the holiday season, local children from Gary participated in the ‘Shop with a Cop’ program alongside officers from the IU Police Department – Northwest. The children shopped for toys at a local Wal-Mart, with IUPD-NW Officers Melvin Blakely and Ricardo Garcia, and Chief of Police Patricia Nowak. Officer Michael Trueblood helped to organize the event.

Pictured: Michael Aguilar (right) and Jada Appling (center), with Officer Ricardo Garcia (left), Chief Patricia Nowak and Officer Melvin Blakely (second from right).

Online Poll

Share your IU Northwest pride with the region by participating in Northwest Indiana Business Quarterly’s ‘The Best in Business’ online poll that is open through February 28, 2013.

Categories for which you could consider casting an ‘IU Northwest’ vote include:
- Best university to attain an MBA
- Best university for a technology degree
- Best university online degree program

Vote Now
Coronary Artery Disease (CAD) occurs when plaque builds up in the arteries that supply blood to the heart (called coronary arteries). Plaque is made up of cholesterol deposits, which can accumulate in your arteries. When this happens, your arteries can narrow over time. This process is called atherosclerosis.

Plaque buildup can cause angina, the most common symptom of CAD. This condition causes chest pain because the heart muscle doesn’t get enough blood. Over time, CAD can weaken the heart muscle. This may lead to heart failure, a serious condition where the heart can’t pump blood the way that it should.

For some people, the first sign of CAD is a heart attack. A heart attack occurs when plaque totally blocks an artery carrying blood to the heart, or when plaque deposit breaks off and clots coronary artery. Cells in the heart muscle that do not receive enough oxygen-carrying blood begin to die. The more time that passes without treatment to restore blood flow, the greater the damage to the heart.

Health and Wellness Column

Gail Zacok, IU Northwest Campus Health and Wellness Center

- Every year, about 935,000 Americans have a heart attack.
- About 15 percent of people who have a heart attack will die from it.
- Almost half of sudden cardiac deaths happen outside of a hospital.

Heart Attack Signs:

- Uncomfortable pressure, squeezing, fullness or pain in the center of your chest.
- Pain or discomfort in one or both arms, the back, neck, jaw or stomach.
- Shortness of breath with or without chest discomfort.
- Breaking out in a cold sweat, nausea or lightheadedness.

If you have any of these signs, don’t wait more than five minutes before calling for help. Call 9-1-1 and get to a hospital right away.

Reduce your Risk:

- Schedule an appointment with your healthcare provider to learn your personal risk for heart disease.
- Quit smoking. Just one year after quitting, you’ll cut your risk of CAD by 50 percent.
- Start an exercise program. Walking 30 minutes a day can lower your risk for heart attack and stroke.
- Modify your diet:
  - Limit unhealthy fats and cholesterol
  - Eat more vegetables and fruits
  - Select whole grains
  - Reduce your salt intake
  - Control your portion size

Sources:
Centers for Disease Control and Prevention’s Division for Heart Disease and Stroke Prevention
American Heart Association
National Heart, Lung, and Blood Institute

Upcoming Events

Click on the BOLD title for a link to more information.

Various dates in February
Black History Month Activities
Feb. 5 - 6
Town Hall Meetings
Topics: Campus Green Space and Budget Briefing
Tues. Feb. 5, 9-10 a.m.
Wed. Feb. 6, 1-2:30 p.m.
Anderson Lib/Conf.Ctr, 105

Feb. 13
Darwin Day
Feb. 20
“No Child” Performance
Feb. 23
Science Olympiad
Feb. 24
College Goal Sunday
Feb. 27 - 28
Grad Fair
March 6
One Book…
One Campus…
One Community reading initiative
Author Wes Moore visit to campus
Please congratulate Tin-Chin Lin, Ph.D., associate professor of economics, whose paper entitled “A Differencing-Data Study of Student Absenteeism and Performance Progress” has been accepted for publication in the Empirical Economics Letters. He was also informed that his paper entitled “Modeling a Married Couple’s Reciprocal Relationship” has been accepted for publication in the Theoretical Economics Letters. Both journal are refereed journals and are indexed by the Journal of Economics Literature.

Congratulations to Erin Argyilan, Ph.D., associate professor and chair of the Department of Geosciences, who is listed among the contributing authors in a paper, “A Sault-outlet-referenced mid- to late-Holocene paleohydrograph for Lake Superior constructed from strand-plains of beach ridges,” which appeared in the November issue of the Canadian Journal of Earth Sciences. The article was named an “Editors’ Choice” selection by the journal.

Professor Emeritus of History James Lane, Ph.D. was awarded in December with the Indiana Historical Society’s (IHS) 2012 Dorothy Riker Hoosier Historian Award. The award is presented to a historian who has made distinguished contributions to the field of historical scholarship and/or the affairs and activities of IHS. Lane has dedicated decades to researching, teaching and publicizing the unique history of the Calumet Region. While Lane retired from the classroom in 2007, he is still ever-present on the Northwest campus as co-director of the IU Northwest Calumet Regional Archives.

“So you want to be a scientist ...”

Representatives of IU Northwest and IU School of Medicine-Northwest visited Kathryn Hedges’ Health Science class at Lew Wallace STEM Academy in Gary recently as part of the American Physiological Society’s PhUn (Physiology Understanding) Week.

Tatiana Kostrominova, Ph.D., and Nancy Mangini, Ph.D., told the class about their very different paths to becoming research scientists and faculty at the medical school. Okechukwu Valentine Nwogbo, M.D., gave his perspective on becoming a medical doctor and the importance of being both a researcher and clinician in delivering good health care.

Biology/pre-med student Miracle Anokwute engaged the students in an activity showing how it is that we are all scientists in everyday life. The visit concluded with the students performing an experiment using eggs to show how our brains are protected by our skull and cerebrospinal fluid, and with a discussion about how this relates to the problem of chronic traumatic encephalopathy (CTE) in athletes.