

The POGIL Inquirer

In The Spotlight

Susan Shadle

Boise State University

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Dear Friends,

From The POGIL Project Director



Thank you for a fantastic 2015. Throughout the year, our POGIL community facilitated 37 workshops to train new practitioners and provide additional support for those of you who are more experienced. We conducted our 13th POGIL National Meeting and made significant progress toward our five-year strategic plan. We published seven new collections of classroom materials, with more in the pipeline. And, thanks to you, we had a marvelous fundraising season, exceeding our fundraising goals by more than \$2,000 to help provide even more educational experiences for teachers.

Not to be outdone, 2016 is already off to an auspicious start. On January 9, our Google CS4HS Community of Practice met at Haverford College for its second in-person workshop, and on the weekend of January 16 in Myrtle Beach, S.C., 17 teachers participated in a well-received POGIL facilitator workshop.

We also hope that you'll join us for learning, inspiration and community support during one of our five POGIL regional workshops this summer. They fill up quickly, so please check our website at www.pogil.org for location and registration information. Finally, I look forward to seeing many of you during the POGIL National Meeting in June.

Thanks for all you do on behalf of The POGIL Project and for continuing to champion POGIL for our teachers and students. The door is always open in our office—please call or email us any time!

Richard B. Moog

Upcoming POGIL Events

- | | |
|---------|--|
| Feb. 16 | Teaching with your Mouth Closed: Facilitating Student Collaborative Learning |
| Feb. 18 | Intro Workshop — Florida Gulf Coast University |
| Mar. 18 | Intro Workshop — Albany (CA) High School |
| Mar. 28 | Round Lake High School |
| Apr. 14 | Intro Workshop — Virginia Military Institute |
| Apr. 18 | Intro Workshop — Omaha Public Schools |

For more information on upcoming POGIL workshops, visit www.pogil.org

*The POGIL Inquirer is a publication of The POGIL Project, a 501(c)3 corporation.
The POGIL Project • Box 3003 • Lancaster, PA 17604-3003
Rick Moog, Director Marcy Dubroff, Editor Mitchell Winter, Intern*



Ask The Mole

Q: Are you looking for formative feedback to improve an existing activity?

A: The *activity feedback* process is for authors who wish to receive formative feedback on one or more POGIL activities that they have written. Authors can receive formative feedback from experienced POGIL practitioners in order to revise and improve the quality of submitted activities. Using the Content Rubric Feedback Form, feedback about content learning objectives, the learning-cycle structure, and the clarity and flow of the activity will be given. In addition, using the Process Skills Feedback Form, feedback on the process-skills goals and the cooperative structure of the activity will be given. To receive feedback, authors should submit one activity at a time to Sarah Rathmell: sarah.rathmell@pogil.org. This submission should contain the student activity and any accompanying handouts, an answer key for the activity, a classroom implementation plan if appropriate, and the Activity Submission Form. Before submitting an activity for feedback, authors often find it very helpful to check their activity using the Elements of a Typical Classroom, Activity and Author Guidelines for Developing Activities. Our goal is to give authors and reviewers realistic deadlines, between submitting activities and receiving feedback. We aim for a turnaround rate of approximately 4-6 weeks - subject to change, depending on reviewer commitments and availability.

Read more here: <https://pogil.org/resources/writing-submitting-pogil-activities>

If you have any questions regarding inquiry learning, POGIL materials, or any POGIL-related knowledge, email us at marcy.dubroff@pogil.org



Where in the World is the POGIL Water Bottle?

From humble origins in Lancaster, PA, (713 College Avenue, right) POGIL has grown and expanded across the United States and around the world.

We're asking you to send us a picture of your POGIL water bottle wherever you may be to show the POGIL community the wide-ranging scope of our unique pedagogy (and our really cool bottle). Let's see how many places we can reach.

At right, the POGIL water bottle frames beautiful Myrtle Beach, SC at the onset of our facilitator training workshop this past January.

Send your photo or video of your water bottle to Marcy Dubroff at marcy.dubroff@pogil.org



Susan Shadle Named Idaho Professor of the Year



Boise State chemistry professor Susan Shadle has been named the 2015 Idaho Professor of the Year by the Carnegie Foundation for the Advancement of Teaching and the Council for Advancement and Support of Education.

Shadle, who is director of the university's Center for Teaching and Learning, is one of 35 state winners and four national winners who will be honored today in a reception in Washington, D.C. She is the 10th honoree from Boise State.

"I am delighted to see Professor Shadle receive this recognition," said Martin Schimpf, Boise State provost and vice president for academic affairs. "She not only is an outstanding teacher-scholar herself but a leader in the development of modern pedagogy and the promotion of faculty excellence in teaching, generally."

Shadle's classes often are cited as "favorites" among chemistry majors, due in large part to her efforts to engage students in active learning. While students admit her courses are not easy, they appreciate her efforts to ensure that all students learn important course concepts.

"As long as I have known her, Dr. Shadle has been dedicated to helping students reach their academic and professional aspirations," wrote student and former teaching assistant Stephen Broyles. "No matter how busy she is, she always has time for students."

To enhance learning in large-enrollment courses, Shadle places students in a classroom "neighborhood" of 25 students with an upper-division peer mentor. Within each neighborhood, students work in small teams on carefully crafted guided inquiry activities designed to get them to think about the world as a chemist.

"To successfully implement this in a classroom with 220 students is a truly remarkable achievement," wrote colleague Don Warner in a nomination letter. "Susan not only prepares the daily activities, but she also recruits, trains, and coordinates a small army of undergraduate teaching assistants who are needed to help facilitate the small group activities."

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Shadle, Continued from page 3

Shadle is passionate about teaching and learning. While most of her students will not go on to become chemistry majors, she believes anyone can learn chemistry and she wants them all to leave her class with the necessary tools to consider the air they breathe, the furniture they sit on, and other ‘real life’ examples from the perspective of a chemist – at the atomic and molecular levels.

Shadle has taught at the university since 1996 and helped establish the Center for Teaching and Learning in 2006. The center strives to support, promote and enhance teaching effectiveness and to facilitate engagement in student learning through a variety of innovative teaching techniques. Shadle agreed to take the helm only after negotiating that she could continue teaching both general chemistry and selected upper division courses.

“I care about student success and I care about their learning,” she said. “It would feel awkward to me not to be on the ground myself. Teaching can be really hard, and if the work around effective teaching and learning is not grounded in reality, I could forget that.”

She said that the Center for Teaching and Learning has allowed her to expand her notion of which students are ‘her’ students, expanding the “puzzle and challenge of teaching and student learning” to a university-wide activity.

Shadle is honored to receive the Professor of the Year award, which she believes helps recognize the importance of teaching.

“We don’t often enough take time to talk about teaching at the university level,” she said. “You don’t need an award to stimulate that kind of dialogue, but an award helps us all see that teaching and learning are worth talking about. Anything that creates an opening in which conversations about teaching and learning can happen is a good thing.”

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By Kathleen Tuck, originally published November 19, 2015

<http://news.boisestate.edu/update/2015/11/19/susan-shadle-named-idaho-professor-of-the-year/>

Thank you for an amazing 2015 POGIL Pledge Week!

Thank you to our wonderful POGIL community for your generous support during POGIL Pledge Week, the Extraordinary Give and our Annual Appeal! You contributed a total of \$52,544, topping our campaign goals by more than \$2500! We are thrilled that 132 of you have donated before, and 31 of you are now Sustaining Partners (donors for the past three years or more). And, a warm welcome to our 45 new donors!

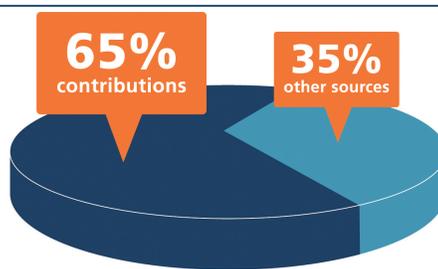
What do you make possible? A teacher from one of our recent workshops said it best: “Students gain deep knowledge and understanding when they are provided with opportunities to build and construct their understanding. POGIL activities are carefully designed so that an instructor can help students

achieve the desired level of understanding.”

Because of the incredible support of our POGIL community during

COST OF POGIL WORKSHOPS

Nearly 2/3 of the cost of POGIL professional development experiences is funded by your contributions.



events like POGIL Pledge Week, The POGIL Project has conducted more than 160 teacher workshops, trained over 4300 teachers, and impacted more than 100,000 students since 2012. Thanks so you, we’re looking forward to reaching even more teachers and students in the coming year!

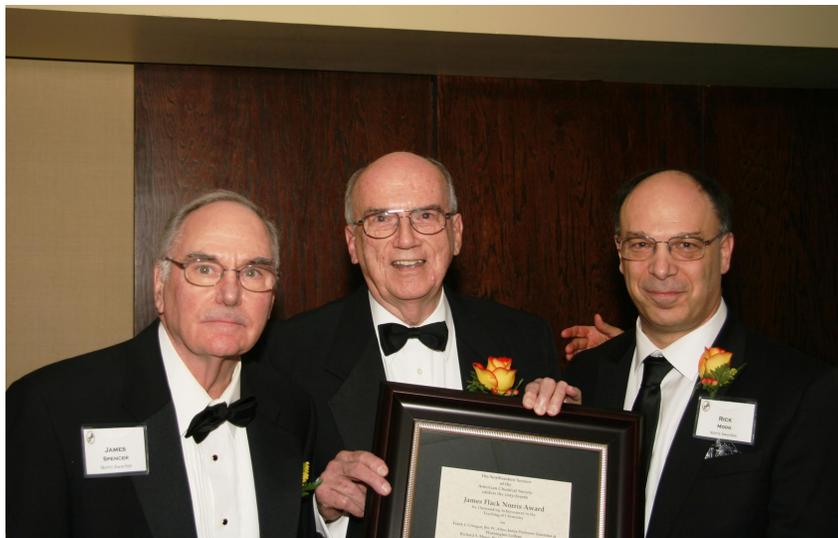
We’d also like to send a special thank you to all of the teachers and students who volunteered to appear in our videos this year! Everyone did a wonderful job and truly inspired us all.

And, if you missed the POGIL Pledge Week videos, please visit <http://www.pogil.org/donate> to enjoy all five and get to know some of the other teachers and students in our extraordinary POGIL community.

Thank you again to everyone for your support. As we say here at The POGIL Project, learning is not a solitary task...and neither is changing it. We couldn’t do it without you!



POGIL Trio Receives James Flack Norris Award



From left to right: James Spencer, Frank J. Creegan, and Rick Moog. Photo credit: James Phillips

Congratulations to **Frank J. Creegan**, the **W. Alton Jones Professor Emeritus at Washington College**; **Rick Moog**, Professor of Chemistry at **Franklin & Marshall College**; and **James Spencer**, the **William G. and Elizabeth R. Simeral Professor Emeritus at Franklin & Marshall College**, who received the **2015 James Flack Norris Award for Outstanding Achievement in the Teaching of Chemistry** from the Northeastern Section of the American Chemical Society (NESACS). This honor is awarded to teachers of chemistry

at any level whose efforts have had a wide-ranging effect on chemical education.

The trio received their award in Boston, MA on November 12, 2015. The award was presented by **Patricia Mabrouk, Professor of Chemistry and Chemical Biology at Northeastern University**. Chris Bauer (University of New Hampshire), a veteran POGIL practitioner and colleague of the trio, introduced the POGIL recipients, who then presented a brief overview of POGIL, and in true Project fashion, had all of the dinner attendees complete a POGIL activity.

Their citation reads, “You receive this award in recognition of your role in developing, implementing, and disseminating the Process Oriented Guided Inquiry Learning approach known as POGIL. Grounded in modern cognitive science and the sociology of learning, POGIL puts learning squarely in the hands and minds of the learner providing when needed support and guidance – an approach that you have modeled in creating a world-wide non-profit organization committed to developing professional educators, curriculum developers and leaders in the chemical education field – quite literally an army of POGIL collaborators through regional and national workshops, symposia, and conferences affording professional development opportunities for both beginners as well as advanced practitioners. As a result of your truly collaborative nature and your commitment to your students, young and old, it is no surprise that POGIL has been implemented at the high school level (chemistry and biology), and that materials have been developed for both classroom and laboratory in all the chemical disciplines including physical chemistry, biochemistry, analytical chemistry, and organic chemistry, and that it is crossing academic disciplines into biology, mathematics, economics and physics. It is fitting, therefore, that the Northeastern Section of the American Chemical Society recognizes your contributions to chemical education with the 2015 James Flack Norris Award for Outstanding Achievement in the Teaching of Chemistry.”

Great Start for Google Computer Science for HS (CS4HS) Grant

After their initial three-day POGIL workshop last summer, the high school computer science teachers participating in the Google CS4HS Community of Practice have been testing new POGIL-CSP (Computer Science Principles) activities in their classrooms and providing valuable feedback for the authors.

The group has also been meeting monthly on Google Hangout to share their experiences, ask questions, and offer community support. On January 9, 2016, the CS4HS teachers attended their mid-year workshop at Haverford College, facilitated by Clif Kussmaul and Tammy Pirmann. Topics included: refining POGIL facilitation skills, AP[®] Computer Science, and writing POGIL activities. The project wraps up this summer with a final POGIL workshop.

Google CS4HS is funded by a grant from the Google Education and University Relations Fund of TIDES Foundation.



To **Laura Lavine** of Washington State University for being selected as the winner of the university's R.M. Wade Award for Excellence in Teacher.

To **Stephen Prilliman**, chemistry professor and department chair at Oklahoma City University — Stephen won the school's Outstanding Faculty Award which celebrates outstanding performance in all areas of academic pursuit and acknowledges special achievement in the endeavor of teaching.



2016 POGIL Regional Coordinators

North Central (IA, IL, IN, MI, MN, SD, ND, NE, OH, WI)
Kristin Plessel, University of Wisconsin-Rock County
(kristin.plessel@uwc.edu)

Northeast Region
(CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT, WV)
Steve Gravelle, St. Vincent College
(sgravelle@stvincent.edu)

Northwest (AK, ID, MT, OR, WA)
Laura Lavine, Washington State University
(lavine@wsu.edu)

Southwest (AZ, CA, CO, HI, NM, NV, UT, WY)
Matt Horn, Utah Valley University
(hornma@uvu.edu)

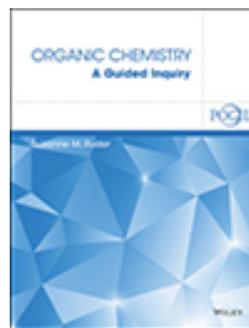
South Central (AR, KS, LA, MO, OK, TX)
Gina Frey, Washington U. in St. Louis
(gfrey@wustl.edu/)

Southeast (AL, FL, GA, KY, NC, MS, SC, TN, VA)
Rob Whitnell, Guilford College
(rwhitnel@guilford.edu)

Please contact any of the Coordinators if you have any questions about events or workshops in your region.

New POGIL Publication

Organic Chemistry: A Guided Inquiry



Ruder, Suzanne
M. Lancaster, PA: The POGIL Project; New Jersey: Wiley, 2015. ISBN: 978-1-119-234690-9

These Organic Chemistry activities cover most of the important concepts for a two-semester organic chemistry sequence. The activities are grouped into organic 1 and organic 2, although that might vary from class to class depending on what concepts are covered in each semester.

Registration is now open for POGIL's Summer 2016 Regional Workshops

If you are a high school or college/university teacher and want to enhance your professional development, these workshops are for you! At each workshop location, you will learn about POGIL's philosophy and methodology. You will also learn about different facilitation techniques and have opportunities to write and review activities, as well as attend informative poster and plenary sessions.

Whether you are new to guided inquiry learning, an advanced POGIL practitioner, or somewhere in between, these workshops will provide a wealth of opportunities to gain new insights, grow professionally, and take home tangible skills.

Introductory Track: No prior experience or workshop attendance required. Experience POGIL methodology and learn to facilitate POGIL activities.

Intermediate Track: Previous attendance of at least 3-hour POGIL workshop required. Improve facilitation skills and be introduced to POGIL activity structure.

Advanced Track: Previous attendance at a 3-day POGIL Regional Workshop required. Improve facilitation skills. Write and receive feedback on POGIL activities and/or develop a Scholarship of Teaching and Learning project.

New in 2016 – Lab Track: Designed for those who are interested in learning how to implement guided inquiry into STEM laboratory courses. Conduct actual experiments from the student's perspective. Discuss the unique benefits and challenges of using guided inquiry for teaching lab classes. Begin writing guided inquiry experiments.

Registration Information

The workshop fee is \$399, which includes registration, materials, three lunches, and two dinners. On-campus housing for two nights is available for an additional \$150 and includes two accompanying breakfasts. Go to pogil.org to register for any of these workshops.

Workshops with Introductory and Intermediate tracks:

Southwest Region: Santa Clara University (Santa Clara, CA), June 28-30

Southeast Region: Davidson College (Davidson, NC), July 12-14 - ***Lab track also available**

Workshops with Introductory, Intermediate and Advanced tracks:

Northeast Region: Simmons College (Boston, MA), June 27-29 - ***Lab track also available**

Central Region: Washington University in St. Louis (St. Louis, MO), July 18-20

Northwest Region: University of Puget Sound (Tacoma, WA), July 18-20

Spots are available on a first-come, first-served basis. For more information, visit our website or contact Julie Boldizar (julie.boldizar@pogil.org) or Ellen Harpel (ellen.harpel@pogil.org)

POGIL Published Works

The Effect of POGIL on Academic Performance and Academic Confidence

S. De Gale, L.N. Boisselle. *Science Education International* (2015), 26(1), p. 56-61

ABSTRACT: POGIL (Process Oriented Guided Inquiry Learning) is a collaborative learning technique that employs guided inquiry within a cyclic system of exploration, concept invention, and application. This action research explores students' academic performance on a unit of organic chemistry work taught using POGIL, in addition to the effect of POGIL on their academic confidence. The academic performance was measured using a summative assessment at the end of the study whilst academic confidence was measured using a pre- and post-test questionnaire. A qualitative comparison to the previous term's academic scores suggested a varied academic performance, whilst test of significance indicated an improved level of academic confidence among the students involved. It is hoped that this study will serve as a platform for the use of more student-centered pedagogies in chemistry at the institution at which it was enacted, and education at large.

Using POGIL Activities to Teach CS Principles to Diverse Students

Helen H. Hu. *Proceedings of the 46th ACM Technical Symposium on Computer Science Education* (SIGCSE '15)

ABSTRACT: As part of the new AAC&U TIDES initiative (TIDES: Teaching to Increase Diversity and Equity in STEM), Westminster College has created a new computer science course for non-majors and paired it with a biology course as a first-year Learning Community. The new CS0 course relies heavily on culturally sensitive POGIL articles to be welcoming to all students, shifting to a more equitable, multicultural approach to CS curriculum and instruction. Process Oriented Guided Inquiry Learning (POGIL) is a student-centered learning approach that 1) assigns students to work in self-managed *learning teams*, 2) on specially designed *guided inquiry* materials, 3) while the instructor facilitates development of *process skills*. By requiring students to derive CS concepts for themselves while working together in learning teams, POGIL activities allow diverse student voices to be heard. They also provide a framework for instructors to act as "guides on the side" rather than "sage on the stage" for a large portion of class time. These CS Principles POGIL activities are among the first POGIL activities in any discipline to be deliberately designed to be culturally sensitive. In Fall 2015, CS instructors at four partner institutions will adopt these POGIL activities in their CS0 courses.

Another Successful Facilitator Training Workshop



The POGIL Facilitator Training Workshop returned to beautiful Myrtle Beach, SC this past January, with veteran facilitators Suzanne Ruder, Andy Bressette and Patrick Brown leading the workshop. Participants included: Joyce Easter, Belinda Edwards, Angie Etwiler, Stoney Jackson, Brian Johnson, Melinda Kalainoff, Anna Klein, Susanne Lewis, Beth Mentis, Susan Morgan, Chris Moros, Ruthanne Paradise, Brian Ruhmann, Jeffrey Spencer, Elizabeth Straszynski, Craig Teague and Gary Washington.

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POGIL Published Works

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The Use of POGIL Teaching Strategy Increases Student Learning of Basic Pharmacology Concepts

Robert Soltis *The FASEB Journal* (2015), 29(1) Supplement 687.28

ABSTRACT: Process-oriented guided inquiry learning (POGIL) is an active learning, team-based teaching strategy that has been used in college chemistry courses to promote deeper understanding and develop higher-order thinking skills. The use and evaluation of the POGIL strategy in pharmacology courses has not been reported. Our hypothesis is the use of the POGIL strategy will increase student overall exam performance, specifically exam questions requiring higher level thinking skills. Data were collected over a three-year period from a first professional year pharmacy course. In 2011, content was presented using a lecture-based format and then, in 2012 and 2013 the same content was covered using the POGIL strategy. Comparisons included overall performance on exams and on questions sets classified as requiring either lower order thinking skills (knowledge, comprehension) or higher order thinking skills (application, analysis). Statistical comparisons made using one way analysis of variance. Data are reported as means + standard errors. Overall exam scores improved significantly when moving from a lecture-based course (80.0%+0.8) in 2011 (N=112) to using the POGIL strategy (84.0%+0.8 and 83.2%+0.8) in 2012 (N=111) and 2013 (N=111), respectively ($p < 0.01$). On those questions classified as requiring higher order thinking skills, student performance significantly increased from 75.8%+1.0 in 2011 to 83.1%+1.1 and 82.5%+1.2 in 2012 and 2013 when the POGIL strategy was used ($p < 0.01$). Performance on lower order thinking skills was unchanged (92.0%+0.9, 91.6%+1.0, and 91.3%+1.1 $p = 0.70$). The use of POGIL teaching strategy increased student performance on questions requiring higher order thinking skills, suggesting the strategy is effective in promoting deeper learning and problem solving skills.

During POGIL Implementation the Professor Still Makes a Difference.

Daubenmire, Patrick L.; Bunce, Diane M.; Draus, Carolyn; Frazier, Meredith; Gessel, Austin; Van Opstal, Mary T. *Journal of College Science Teaching* (2015), 44(5), p. 72-81

ABSTRACT: One common notion is that all classrooms using Process Oriented Guided Inquiry Learning (POGIL) are the same. Though POGIL has essential components, this research found that students' conceptual achievement, a classroom outcome, can be differentially affected by professors' style of POGIL implementation. Audio/ video recordings of student groups interacting during POGIL classes were analyzed, and these interactions were coded and characterized using two methods of coding. One involved phases and bridges of student interactions and the other examined student's patterns of argumentation based on the Toulmin model of argumentation. As a result, differences in student outcomes between POGIL sections are explained as being influenced by nuanced ways professors interacted with groups during classroom instruction.

Special Session: Perspectives on Adopting and Facilitating Guided Inquiry Learning

Helen H. Hu, Clifton Kussmaul, Deepa, Muralidhar, Kristine Nagel *SIGCSE* (2015)

SUMMARY: POGIL (Process Oriented Guided Inquiry Learning) is based on the principle that students learn more when they construct their own understanding. Instead of attending lecture, student teams work through POGIL activities to discover concepts on their own, while instructors circulate and facilitate learning. Students learn the material better, and this constructivist approach also teaches them important process skills, including critical thinking, team work, and leadership. In this special session, SIGCSE attendees will experience a POGIL activity for themselves, learn about the structure of POGIL activities (through a POGIL meta-activity), and hear perspectives from teachers who recently adopted POGIL activities available at <http://cspogil.org>. We will share classroom-tested guided inquiry activities and discuss how POGIL can transform CD classes at all levels, from high school to graduate-level classes, from small schools to large universities.

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POGIL Published Works

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Can Group Scenario Exercises in Fundamental Nursing Using Process Oriented Guided-Inquiry Learning (POGIL) Affect National Test Scores

Maureen, C. Roller

“In nursing, due to the complex nature of its curricula, innovative pedagogy should be explored to present this complex material. Published reports on the POGIL method of delivering science courses have documented success of students. For example, a study of 200 undergraduate students investigated whether POGIL use affects grades, retention, self-efficacy, attitude and learning environment in a first semester chemistry course. Grades have some positive results in the POGIL group versus the control (non-participant group). Retention rates varied, however emotional satisfaction and attitude toward chemistry was lower in the control population. Overall the POGIL approach had minimal impact on the results. No difference was revealed in self-efficacy between groups. The most positive result was the attitude toward learning environments of the POGIL students (Case, Pakhira & Stains, 2013). Undergraduate biomechanics courses traditionally were taught by lab and lecture method. Students reported that lectures were not engaging and learning was not enhanced. POGIL (N=64) and traditional instruction methods (N=52) were compared. Quiz, tests and course grades were reported to be higher in the POGIL group (Simonson & Shadle, 2013). Much of the research is centered on chemistry and other science courses. Studies have not included nursing courses utilizing the POGIL method. Although it is a useful strategy, POGIL has not been effectively documented in nursing courses. Therefore, the aim of this study was to evaluate if POGIL group scenario exercises improve test scores in a fundamental nursing course.”

Share the Love

Hi POGIL Friends! Share the love with POGIL as you shop for Valentine gifts on Amazon Smile!! Be sure to choose The POGIL Project as your charity using this link: smile.amazon.com

Planning to shop at Amazon.com for Valentine's Day? Spread the love even farther when you make your purchase through Smile.Amazon.com!

For each eligible purchase, Amazon Smile will donate 0.5% of the purchase price to The POGIL Project. Thanks SO much!

XOXO



Looking to Book a Workshop?

- If you would like to bring a POGIL workshop to your area, please get in touch with us! We are interested in teaching more instructors about POGIL at both the high school and post-secondary levels and want to help them make their classrooms and laboratories more student-centered.

Please visit our website and submit an event request at <https://pogil.org/contact/enter-request> or email Marcy Dubroff at marcy.dubroff@pogil.org.



Send us your news!

We'd love to feature your news, your grant, or your video on the POGIL website and in the POGIL newsletter. Send news to Marcy Dubroff at mdubroff@pogil.org

Get all the latest POGIL news by following us on Twitter or Facebook! Sign up to get our @POGIL tweets at [twitter.com](https://twitter.com/POGIL).

POGIL

The POGIL Inquirer

The POGIL Project

Box 3003

Lancaster, PA 17603