Faculty profile

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Incorporating Process Oriented Guided Inquiry Learning (POGIL) into your teaching

POGIL (Process Oriented Guided Inquiry Learning) was developed by education researchers as a strategy to teach chemistry more effectively. What is POGIL, and does it only work in Chemistry classes?

POGIL (https://pogil.org/) is a group-learning instructional strategy grounded in research on how students learn. It was originally developed for general chemistry courses, but today, it is implemented in a range of subjects, such as anatomy and physiology, chemistry, psychology, math, and computer science.

The term "Process Oriented" means students will learn by *participating in an activity* related to the topic. "Guided Inquiry" means rather than providing students information about a topic, faculty facilitate small group activities where *students discover the information themselves*. Faculty work with students to create an effective team learning environment and guide students in the process of learning, helping them develop skills that allow them to generate new information.

For example, a POGIL activity on experimental design in psychology might consist of having groups of students examine data from an experiment on the effects of caffeine and mindful meditation on performance on a cognitive task. Students could work together to respond to prompts about what the data indicate about the main effects that caffeine and meditation have on performance, individually. They could also use the data to describe how caffeine and meditation interact to affect performance. Students could then apply what they have learned about experimental and control groups, main effects, and interaction effects to

design their own experiment (see the sample POGIL activity at the end of this profile for more information).

POGIL activities have a few core characteristics:

- Students are expected to work collaboratively, generally in groups of 3 or 4 with assigned roles (ex: recorder, manager, reporter. etc.).

- Students work on the activity during class time.

- Instructor serves predominantly as a facilitator of student learning (creating and monitoring groups, answering questions, etc.).

For professors in other disciplines who would like to use this practice, how do you know it's working?

The biggest "aha moment" is realizing where student misconceptions occur. As soon as you hear the discussions, you realize what they understand, or where the models they are applying are not the most appropriate and will not achieve the desired objective. The activities also provide information on student stumbling blocks, (e.g., a large number of students get question #4 wrong) and then you can address the concept, and work through the problem immediately. There is a huge amount of power in meeting the students where they are and providing immediate feedback to facilitate progress.

What advice do you have for other instructors who are interested in doing something similar?

The POGIL model helps instructors focus on what is learned, rather than what is covered. It is an active learning model where students apply the content knowledge, while receiving real-time guidance from peers and instructors.

I have found that POGIL is more effective in person. Since we've been back on campus, the method has yielded discussions that help me identify gaps in student understanding and ultimately improve student learning. Instructors new to POGIL may want to start by including just one activity, and then they can refine their activity design and begin to add more activities.

CET Tips: Sample POGIL Activity

Here is an example of a POGIL activity, which consists of a detailed activity description, prompts for students, instructions on when to check in with the instructor, and an instructor answer key.

To use POGIL in your course, consider modelling an example POGIL activity with the whole class.

- Look through and select POGIL curricular materials in various disciplines. (https://pogil.org/curricular-materials).

- Introduce the activity

- Put students into working groups (with assigned roles)

- Share the POGIL activity worksheet with students (if applicable)

- Monitor the student groups and answer questions that come up during the activity

- Collect each group's work for a graded activity

Kendra Walther teaches in the Information Technology Program at the Viterbi School of Engineering. Kendra is passionate about teaching and is constantly trying to find more ways to help her students understand the principles of programming.