An Overview of POGIL

Laura Trout, Lancaster, Pennsylvania
Lancaster Country Day School
The POGIL Project
Objectives and Outcomes

This session is designed for those with limited or no previous exposure to POGIL. Participants will:

• See a POGIL classroom in action
• Learn about POGIL pedagogy
• Learn about POGIL implementation at other schools
• Find out where they can find more information
The POGIL Project

• Launched by sequential National Science Foundation (2003-2012) and other grants
• Based on curricular work done by a variety of like-minded people in the mid-1990s
• Became a not-for-profit organization in 2010
• The mission of The POGIL Project is to connect and support educators from all disciplines interested in implementing, improving, and studying student-centered pedagogies and learning environments.
The POGIL Project

• The POGIL Project is run by:
  • A Board of Directors
  • A Director (Rick Moog, Franklin & Marshall College)
  • A Steering Committee of experienced practitioners (eight college and high school faculty)
  • Eight part-time and full-time staff in POGIL National Office (Lancaster, PA)
The POGIL Project

• Offers faculty development
  – More than 20 workshops each year for high school and college faculty
  – Institutes for workshop facilitators
• Actively involves almost 1,000 individuals each year
  – Workshop attendees, workshop facilitators, curriculum developers
• Has touched thousands of people
  – More than 1,000 people are implementing POGIL pedagogy across multiple disciplines
A POGIL Classroom
What is POGIL?

Process Oriented Guided Inquiry Learning
What is POGIL?

Process Oriented (Cooperative Learning):
Develop Key Process Skills

Process Oriented Guided Inquiry Learning
Process Skills

- Information Processing
- Critical Thinking
- Problem Solving
- Communication
- Teamwork
- Management
- Assessment
What is POGIL?

Guided Inquiry (Constructivism): Learning Cycle Activities

Process Oriented Guided Inquiry Learning
Learning Cycle Activities

- Orient
- Explore
- Invent
- Apply
- Close

induce

deduce
What is POGIL?

Process Oriented (Cooperative Learning): Develop Key Process Skills

Guided Inquiry (Constructivism): Learning Cycle Activities

Process Oriented Guided Inquiry Learning
POGIL Implementation

• Students work in groups
• Students construct knowledge
• Activities use the Learning Cycle paradigm
• Students teach, discuss and learn from other students
• Instructors facilitate learning
Model 1 - Atoms, Particles and Molecules

- **R**
  - 8 particles
  - atom
  - chemical bond

- **T & RSq & R**
  - 5 particles
  - molecule
  - atoms
  - chemical bond

- **?**
  - molecule

- **RSq**
  - molecule
  - atoms
  - chemical bond

- **Sq2**
  - molecule
  - chemical bond

- **?**

- **TSq2R**
  - chemical bond

- **SqR3 & TSq**
  - chemical bond
Whole Class Discussion

Incorporate reporting out of answers in a POGIL classroom.
Information Processing Model


Constructivist Model of Learning

• “Learning is not the transfer of material from the head of the teacher to the head of the learner intact, (but) the reconstruction of material in the mind of the learner.”

• “It is an idiosyncratic reconstruction of what the learner . . . thinks she understands, tempered by existing knowledge, beliefs, biases, and misunderstandings.”

What Students Say

HOW POGIL HELPS STUDENTS
Why Teachers Use POGIL
Analysis of Student Outcomes

Data on the use of POGIL in a variety of academic settings
• “Lecture”: F1990–S1994: n = 420

• Sections of approximately 24 students
• Same instructors
• Students randomly placed Fall semester and designate preference Spring semester (but not guaranteed to get their choice)
• Compare course grades (ABC’s vs. DFW’s)
General Chemistry at Franklin & Marshall College

Data from classrooms of Moog, Farrell, and Spencer


Chi-squared = 40.9; alpha < 0.005
Organic Chemistry 1 at a Large Public University

- Two sections--one lecture, one POGIL--taught at the same time
- Students randomly placed in sections
- Compare withdrawal rate and common exam scores
  - Final exam created solely by lecture instructor and administered to both groups
Organic Chemistry 1 at a Large Public University

Withdrawals & Common Final Exam Scores, Fall 2000

Lecture, $n = 109$
- Withdraw 47%
- A 12%
- B 19%
- C 16%
- D 5%
- F 1%

POGIL, $n = 75$
- B 32%
- C 31%
- D 15%
- Withdraw 12%
- A 9%
- F 1%

Chi squared = 19.1  Alpha < 0.005

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Organic Chemistry 2 Pre-Quiz at a Large Public University

• Classes of about 250
• Unannounced quiz given on first day of Organic 2 (written by a non-POGIL instructor)
• Students had taken Organic 1
  – With lecture (two different instructors)
  – With POGIL
Organic Chemistry 2 Pre-Quiz at a Large Public University

Organic 2 Pre-quiz Results (Lecture vs. POGIL Organic 1)

Now What?

The POGIL Project website

www.POGIL.org

• Event Calendar
• Implementation Guide
• Resources
Now What?

Flinn Scientific Website

- POGIL activities for chemistry and biology
- Sample activities
To complete a brief questionnaire about this webinar, and to generate your certificate of attendance, visit: 

To Download Resources: 
http://bit.ly/1gOBeyV

Questions?