

Final Report for
Diverse Approaches to Active Learning
Centre College

January Haile, january.haile@centre.edu, 859-238-5880
Jennifer Muzyka, jennifer.muzyka@centre.edu, 859-238-5413
Jason Neiser, jason.neiser@centre.edu, 859-238-6036

May 2010 - December 2010
\$8,000

The original goal of our project was to encourage our colleagues to investigate and explore some active learning pedagogies with which they may not already be familiar. To this end, we laid plans for three workshops. The first would be a day-long affair hosted on-campus, with a follow-up workshop hosted electronically. The third event was originally slated to be a webinar on Just-in-Time Teaching (JiTT) led by an off-site expert. In the end, we decided to focus our energies on in-person, on-campus workshops and dropped the idea of the JiTT electronic workshop (JiTT had already been described to the Centre community in another forum recently).

On Tuesday August 17, we hosted the first workshop on Centre's campus. The morning session featured presentations on two approaches to active learning from seasoned practitioners of their respective methods. First, Kenneth Heller and Qing Xu, physicists from the University of Minnesota, discussed collaborative group problem solving using context-rich problems. Megan Hoffman (biology, Berea College) and Julie Lively (biochemistry, Sewanee) followed with a demonstration of Process-Oriented Guided-Inquiry Learning (POGIL). In the afternoon session, participants chose one of the two methods to investigate further. For the remainder of the day, the speakers and participants engaged in more detailed conversations about how to implement these pedagogies for their specific courses. Twenty-six participants, mostly Centre College faculty members, attended the workshop. We also had attendees from other academic institutions in the region, including Danville High School (1), Eastern Kentucky University (3) and University of Kentucky (1). Several academic disciplines were represented: biology, chemistry, history, math, physics, political science, and psychology.

In October, we hosted two follow-up workshops. We had originally planned for these workshops to meet electronically. Since one of our workshop leaders (Megan Hoffman) is in central Kentucky, we decided to host these meetings in person instead. On Monday October 18, seven individuals (all Centre College faculty members) met at Centre College to discuss issues related to implementing these active learning approaches. On Saturday October 30, three individuals (representing UK, Berea, and Centre) met in Lexington and discussed assessment and effectiveness of active learning approaches. Several other individuals indicated interest in attending but were unable to do so due to scheduling conflicts.

To further encourage the development and use of the pedagogies, a recommended reading list for each of the techniques was compiled and attendees were offered copies of books they selected for further study. Dr. Heller provides a free online text describing group problem solving and context-rich problems, and several participants took advantage of the book offer to learn more about POGIL and JiTT. 14 participants requested additional materials. Of the 28 books requested, eight POGIL books, either the handbook or activity books were requested by the participants. In addition, three Teaching Physics books, two Scientific Teaching books, and 15 JiTT texts were chosen.

We are scheduled to give a presentation titled Active Learning Pedagogies as part of Centre's Pedagogy Luncheon series on Thursday, February 24. As part of our presentation, three workshop participants will give short presentations describing the changes they have instituted as a result of the workshops. We will also submit a summary article for the summer edition of Centre's Pedagogy Newsletter. When we submit the article for the pedagogy newsletter, we will also send copies for consideration in the Palladian and for the files in the ACS grants office.

Making the transition to these active learning pedagogies often requires fundamental changes to how time is spent in the classroom. Space constraints and fixed seating arrangements can also hinder implementation of these active methods. New classroom spaces (indeed—a fully renovated building) have lowered some of these barriers to implementation, but the purchase of three sets of “huddle boards” (portable white boards around which small groups of students can gather, work, and display answers) have also made the practice of these methods easier.

Most of the Centre faculty members who attended the workshop are members of Division III, representing disciplines in science and math. The participants in the follow-up workshops were chemists, physicists, and mathematicians. These figures suggest that the impact of the workshop was the strongest on faculty members in math and science, which probably reflects the fact that the workshop leaders were all scientists and these pedagogical approaches have been most heavily developed in scientific disciplines. It should be noted that we did search unsuccessfully for one POGIL leader outside of the sciences. As a participant, it is clearly easier to relate to a speaker from a familiar academic discipline. We recognize that had we found a qualified speaker from a non-STEM discipline, the workshop appeal would have been broader. Nevertheless, the fact that several colleagues requested books for further study, and more than a few instructors besides the organizers have made use of these techniques in their classes speaks to the impression this grant has made on Centre's campus. While we were hopeful for a larger impact in the non-STEM disciplines, our local results are still quite gratifying.

Brief Summary for ACS Faculty Renewal website

January Haile, Jennifer Muzyka, and Jason Neiser of Centre College organized a series of workshops to highlight and teach the implementation of two particular active learning pedagogies. The first workshop in August 2010 introduced participants to cooperative group problem solving using context-rich problems, and to process-oriented guided-

inquiry learning (POGIL). The morning session featured a presentation by Ken Heller and Qing Xu, physicists at the University of Minnesota, who have studied the use and efficacy of group problem solving. Presenting the POGIL method were Megan Hoffman, a biologist at Berea College, and Julie Lively, a biochemist at the University of the South. In the afternoon session, participants chose one of the two methods to investigate in greater detail. During the fall term, two smaller follow-up sessions were held that allowed participants to discuss their implementations of the teaching methods.