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About the CTEI

The Center for Teaching Excellence and Innovation partners with faculty, postdocs, and graduate students to extend instructional impact by connecting innovative teaching strategies and instructional technologies

CENTER for
TEACHING
EXCELLENCE &
INNOVATION



Bring on the Collaboration!

Rebecca Pearlman, Senior Lecturer, Department of Biology

The Issue

Getting students to participate in class discussions is a common challenge. Every instructor has faced the dreaded silence after posing a question. Active learning activities can stimulate student engagement, but they can be difficult to implement in classrooms that were designed for lectures — fixed seating inhibits opportunities for collaborative exercises such as group work and discussion.



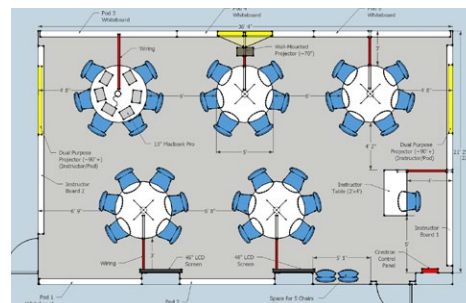
Why does it matter

Research has shown that active learning strategies can improve students' retention of content taught in class¹. A variety of teaching methods — such as peer-instruction, discussion groups, and collaborative problem solving — can foster greater student engagement. Each of these methods requires students to connect, share information, and discuss possible solutions to posed problems, anticipating real life workplace situations.

Faculty who want to implement active learning strategies may find it challenging to manage in a space designed for lecture-based instruction. In the last decade, universities have introduced classrooms to address this challenge. Typically known as studio or collaborative learning classrooms (CLCs), such spaces often have round, movable tables for group work, ample whiteboard space, and large display screens for each group. This learning environment has a positive effect on students' engagement; it alters their roles in the classroom from passive recipients of knowledge to active participants in their own learning.

Approach

At a *National Academies Summer Institutes on Undergraduate Education* last summer, several Hopkins colleagues and I participated



in group work in a space designed for collaboration. We were impressed by the power of that learning experience. Shortly after the workshop, we learned that the Provost's Gateway Sciences Initiative would be underwriting the conversion of a traditional learning space (Krieger 309) into a collaborative learning classroom. I decided to offer my Biology Workshop course in the new CLC in the fall semester of 2012.

The course was designed as a guest lecture series with some meetings set aside for group discussions. Although we continued to offer the guest lectures in a large hall, we moved to the CLC for the group discussions and were delighted to take advantage of the features of this new space. During a typical class, I provided a 5 to 10 minute overview of the day's lesson plan, often using the instructor projectors to play a video or podcast highlighting a current event or controversial topic in biology. For the majority of the class time (30 minutes), students worked in groups using their own laptops to conduct research, discuss potential answers to questions, create charts and other graphics, and post content to the course Blackboard

¹ Michael Prince. *Does Active Learning Work? A Review of the Research*. *Journal of Engineering Education*, 2004.

site. For ten minutes at the end of class, groups took turns presenting their work to the entire class, using the instructor's projectors to display their work.

The room's design allows students to work comfortably in groups, using tools ideal for collaboration. Each group has a whiteboard adjacent to its table where students can jot down notes or conceptualize and work out problems. Students can easily project their individual laptop screens for viewing by the whole class. In addition, the instructor has control over two large screens, which is helpful when presenting materials to the entire class or sharing a group's display with the class. The room's layout facilitates instructor visits to each group while they work, something that is difficult in a lecture hall.



Results

One of the nicest things about teaching in the new CLC was that students seemed to know what was expected of them from the moment they entered the room. Students immediately sensed that this would not be a typical lecture. Moreover, the students responded positively as they engaged in the discussions and participated in their groups, producing a higher caliber of work than I experienced in this course previously.

Students were amazingly "on task" during group work, which speaks to their high level of engagement and enthusiasm. They clearly felt a strong sense of responsibility for their group's performance, particularly when presenting their findings to the class.

In comparison to previous iterations of this course, the students' grades were in the same range; however, the level of engagement was much higher and it was a significantly more enjoyable teaching experience. I know that the students appreciated the active learning aspect of the course because when I presented



in lecture format for more than 15 minutes, I could see them squirming in their seats. They couldn't wait to get started on group work. It has been a challenge to limit my introduction to just a few minutes, and then post supporting material for the students to explore during class with their groups.

Because this class had more discussion and collaborative work than when I previously taught the course, I found that it helped to prepare learning objectives for each session. This kept the focus in place during class and ensured that the group work would meet the goal for the day. It also helped set the students' expectations for what they needed to accomplish and learn for tests.

Other Thoughts

A number of faculty have taught in the new CLC since its creation, ranging from the departments of Chemistry, French, Physics, Mathematics, to Civil Engineering. The room is flexible enough for a number of uses and can support classes from any discipline. The way I conducted my course for instance, is similar to the teaching approach for humanities courses in which class discussions are standard. Although the students in my Biology Workshop did not often use the whiteboards, other classes used them frequently.

There are many methods for generating effective group assignments in class. I found that when my 35 students first entered the CLC, the room's layout clearly suggested that they would be working together at the round tables, which seat seven. They gravitated naturally to self-defined groups around the tables. This proved to be an effective way of forming lasting and productive groups for this class. Other instructors may wish to randomly assign groups or to purposefully break and re-form groups throughout the course.

Additional Resources

- A helpful book about effective ways to teach undergraduate science courses: Jo Handelsman, Sahar Miller, Christine Pfund. *Scientific Teaching*. W. H. Freeman, 2006
- Strategies for group work in class: http://www.cer.jhu.edu/ii/InnovInstruct-BP_MakingGroupProjectsWork.pdf
- To learn more about Krieger 309 and the variety of courses that use it, contact the CER: cteij@jhu.edu

Author's Background



*Rebecca Pearlman,
Senior Lecturer, Department of Biology*

Rebecca Pearlman received a PhD in Biology from the University of Wisconsin. She has over fifteen years of teaching experience ranging from small laboratory courses at a two-year college to large lecture courses at Hopkins. She is delighted to be a lecturer in the Biology Department working with amazing colleagues who are dedicated to improving the undergraduate experience. Her past collaborations with the CTEI include work on creating videos of laboratory techniques and piloting in-class voting and course management systems.