Thompson Center for Learning & Teaching

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Faculty focus

Highlighting innovation in teaching at UM-Flint

Hybrid Spaces:
The Active Learning Classroom

by David Linden

Dr. Chris Pearson notes that, "as far back as the 1980s "the Physics community has been ahead of the curve in education research." Pearson himself recalls participating in innovative group work as a University of Minnesota graduate student in 1989. Fast forward to 2015 and the UM-Flint Professor and Department Chair once again finds himself on Physics' frontline, equipping future generations of the Physics community through the Zick Active Learning Classroom.

Made possible by a generous 2010 pledge from UM-Flint alum David G. Zick and his wife, Francine, the renovated classroom was completed in 2011 and officially dedicated in October of 2012. The first of its kind at UM-Flint, the room is modeled after North Carolina State's original SCALE-UP active learning classrooms. Only two other universities in Michigan have similar spaces.

A departure from isolating sit-and-listen lecture halls, the classroom is designed for face-to-face interaction between students and increased instructor-student interaction. Students sit at tables in groups of 5, with networked computer monitors positioned at the end of each table. The smaller environment reduces the distance between learner and the "up-front" screen, enabling students to work collectively on the day's problems projected through the monitor.

But here UM-Flint's version of the state-of-the art facility departs a touch further from the active learning prototype. Computer monitors in the Zick Classroom sit atop mobile red tool chests. The familiar mechanic-style hubs house various tools of the science trades, signaling the capacity for hands-on experiments in addition to conversation and computer work. A glance around the room at the remaining shelves and tables reveal the space to be a hybrid of sorts, consolidating lecture, discussion, and laboratory into one educational experience.

When asked if and how the classroom has met expectations, Pearson responds without hesitation, "Yes, absolutely. The benefits for both teacher and learner are clearly evident."

From a teaching perspective, the active learning atmosphere fosters one-to-one dialogue with students as they solve Physics problems in real-time. An initial teacher benefit of this interaction is getting to know each student as an individual. Pearson notes that he has "knowledge of student names by the second week of class—that has value for both student and instructor." Apart from the personal connection component, the active learning classroom affords a marked shift in the teaching task. "The instructor's role has

changed from a conveyor of information to a facilitator of knowledge," Pearson asserts. To the communication components Pearson attaches a third teaching benefit, flexibility. The lecture/lab combination carries a lengthier class time (over two hours), granting opportunity to cover more territory with a lesser sense of urgency.

Pearson's own class time is roughly structured in 20-minute increments, including a combination of group activities, Q&A-driven conversation, and quizzing, all aimed to reinforce learnings of the session's material. Pearson has high expectations that his students arrive to class having read the text and prepared to work. In return, he strives for strategic and seamless transitions, but is appreciative of the opportunity to "make adjustments on the fly." "Sometimes it's a balancing act," he quips unapologetically. Pearson fully expects, and readily accepts, that different students enter his class and each session at different points on the learning continuum. "Learning is a process," he stresses, "so students need permission to be wrong along the way because we have to start with what the students do and don't know."

Accordingly, Pearson is equally intentional with student groupings. With student interaction a core active learning initiative, he's attentive to his classes' group dynamics. Based on observed personality styles, group interaction, and assessment (exam) results, Pearson rearranges groups after each major assessment (every 3-4 weeks). This strategy can be met with some initial consternation by students who have an aversion to group work, but Pearson assures student success remains his motive. Regrouping is a means to "combat ruts" he

emphasizes. Students "can't hide or be distracted; they have to interact." Pearson is convinced his grouping approach distributes "equity" to his students, allotting each student opportunity for group contribution and success.

The strategy, combined with the active learning model, is working. Pearson proudly presents data documenting the early academic returns of the Zick investment. Highlighting findings from PHY 143—UM-Flint's first semester of the algebra-based physics sequence, results reveal the percentage of students receiving a passing grade in PHY 143 has increased from just over 65% to 80% with the Zick classroom. Additionally, PHY 143 student GPAs have increased by two tenths.

Pearson is quick to mention the quantitative data above doesn't tell the full story. Many PHY 143 students are not majoring in Physics, but Health Science. These students have "no desire for the course," admits Pearson, "but it's required as part of their major." Pearson explains that this requirement only magnifies the classroom's success. Historically, attrition has been heavy with the Health Science population in PHY 143, but the Zick classroom has translated into success even

for this non-Physics bunch. Beyond numbers, Pearson claims there is likewise "anecdotal evidence" for the active learning impact. Suggesting that students readily see the benefit themselves, a common question among Physics students is "Why don't we have this for other classes?"

Questions like this are of equal interest to the work and research of the TCLT. Pearson suggests the answer to the question is not so cut and dried. Considering the numbers of students to move through PHY 143 (@ 250) and PHY 243 (@125) in an academic year, along with the number of professors who teach those courses (6), having additional active learning classrooms naturally would benefit. But even if additional gifts like the Zicks' become available, there are other considerations. "Eventually space becomes an issue," says Pearson. "There are only so many places to put things on a campus; [the Zick Classroom] happened to be an ideal situation because a classroom and laboratory were already side-by-side. We removed a wall to create one larger room."

For now, any adaptations or additions Pearson envisions are limited to the existing active learning space. Pearson would be content to upgrade the tables in the current classroom. In the future, Pearson envisions larger monitors that could retract into the toolboxes, to increase visibility and enhance group work when the monitors aren't in use.

Still, Pearson remains certain that active learning is central to the future of academia, and Physics in particular: "There are a wealth of learning styles," he maintains, "but group spaces have proven to be most effective."

The teachers and students of the Zick Active Learning Classroom are keeping UM-Flint at the fore.

Note:

This article was developed prior to Dr. Pearson's appointment as Interim Associate Dean.

Written by ***David Linden***

Dave is the TCLT's current Graduate Student Research Assistant and a tutor in the university's Marian E. Wright Writing Center. He is working toward an MA in English with a concentration in Composition and Rhetoric. He aspires to teach writing and/or serve as a staff writer at the university level.

Physics & Astronomy at UM-Flint

The mission of the physics programs and faculty, including integrated programs within CAS, is to prepare students to succeed in their chosen careers after graduation from the University of Michigan-Flint. Recognizing that students will elect many career paths, ranging from elementary teaching, to industry, to graduate education, and others, the department believes its mission is to help students gain a knowledge foundation based upon fundamental principles of classical and modern physics. This foundation stresses the creative application of physics principles to solving newly posed problems and creative thinking. Students should develop the ability to apply these principles to real problems ranging from the very practical for the future elementary teacher, to the mathematical and abstract for the future graduate student. Students should improve in their ability to abstract a problem to its essentials, design and develop experiments to test hypothesis, and correctly interpret the results of an experiment.

Physics Program
207 MSB
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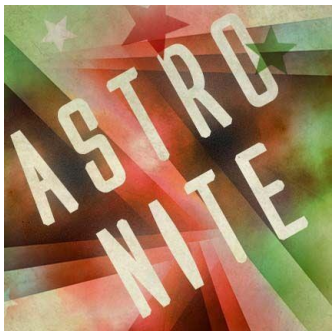
Murchie Science Building Open House

Saturday, October 24, 2015
1:30-3:30 pm
Register to attend: www.umflint.edu/chemistry/msb-open-house

Prospective and current students, and their families, are invited to join the faculty of Murchie Science Building for an open house on Saturday, October 24. Visitors can tour our newly updated classrooms, lab space, and equipment, meet with department members, talk to current program students, and have their questions about the sciences at UM-Flint answered!

The event will include representatives from Biology, Chemistry & Biochemistry, Computer Science & Information Systems, Earth & Resource Science, Engineering, Mathematics, and Physics & Astronomy.

Astro Nite



Saturday, October 24, 2015
7:00—10:00 pm
Longway Planetarium

AstroNite is a family-oriented event, presented in an "open house" style every spring and fall. It is a free and fun way for all ages to celebrate astronomy. Activities explore rainbow forensics, planetary science, telescopes and other instruments, stars, cosmology, and more through hands-on learning, games, and crafts.

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Search "Flint Physics Department Gifts" or enter program code 305256.