



Welcome!

The University at Albany's *Institute for Teaching, Learning and Academic Leadership* provides programs of professional enhancement to the faculty and instructional staff. The Institute focuses on three areas:

- Promoting teaching effectiveness and innovation, both in the classroom and online
- Facilitating academic paths to success in teaching, research, service and leadership
- Supporting instructional development and career preparedness for graduate student instructors

Events

3.13

Dynamic Classroom Teaching
Time: 3-4:30 p.m.
Standish Room (Science Library)

3.21

Teaching Portfolios for GTA's
Time: 3-4:30 p.m.
Standish Room (Science Library)

4.20

A Simple Plan
to Foster Critical Thinking
and Independent Learning
Time: 3-4:30 p.m.
Standish Room (Science Library)

Reservations and Information

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Why teach them what they already know?

The compelling case for Just-in-Time Teaching

A few years ago a professor of physics at a big Midwestern university realized he was spending too much time in lectures covering things that students already knew. The problem was, he could not be sure of what students knew until they took the test—and then it was too late. Also, what students did not know varied from class to class. The professor concluded that he needed more timely information about his students' learning so he could adjust his teaching, but collecting that information had to be manageable even with 200 students.

Daring to Be Different

In the spirit of experimentation he tried a counter-intuitive intervention: he placed some short assessments of student learning at the beginning of that week's unit, rather than where they were usually found...at the end. For many of his colleagues this was perplexing ("You're going to test them before they know anything?"). Unconventional as it was, this inversion had multiple positive effects on students, and Just-in-Time Teaching was born.

Just-In-Time Teaching means that students experience less clutter of untimely information in the classroom.

The term "Just-in-Time" comes from manufacturing, where components arrive at the factory at the exact moment of need and not before. In this way a company reduces overhead, labor and storage cost at the work site. For our physics professor (whose name is Gregor Novak, currently at the U.S. Air Force Academy), Just-In-Time meant that his students experienced less clutter of untimely information in the classroom. Novak identified three goals for his Just-in-Time approach:

1. To maximize the efficacy of the classroom session, where human instructors are present.
2. To structure the out-of-class time for maximum learning benefit.
3. To create and sustain team spirit (student-student and student-teacher). (Novak, G., www.jitt.org)

"Warm-Ups" Drive the Learning

The Just-in-Time approach starts with "Warm-ups," which are short pre-class exercises of 2-4 questions based on an assigned reading. Students submit answers electronically (via e-mail or WebCT) no less than 2 hours before class. These short assignments carry a few points of credit, graded pass-fail, with credit for a reasonable effort, so that even a large batch can be scored in a few minutes. Student collaboration is neither promoted nor discouraged.

The class meeting focuses on the things that tripped students, and skips those things that everyone mastered easily.

While a Warm-up resembles a typical reading quiz, it differs in two important ways: first, it occurs outside the classroom; and second, it focuses on conceptual understanding rather than on recollection. The displacement outside the classroom is advantageous for teaching and learning. For one, the instructor can measure preparedness frequently without using valuable class time. For another, since the instructor can assess comprehension before the class meeting, she can focus class time on the things that tripped students, and skip those things that everyone mastered easily.

Warm-up Design is Key

To be effective the questions cannot be answerable by looking up details in the reading. Instead, each question requires students to extract a concept to explain or apply. Here are examples taken from Physics, Classics, and Economics:

- How would you use the idea of "inertia" (as described in the reading) to explain X (X being a phenomenon not presented in the reading)?
- "Based on the author's use of the word "entelechy" in the 3rd paragraph on page 73, give an example of this concept from your own observation.
- Apply "elasticity of demand" to a product or service sold in your neighborhood, and explain why the term fits your example.

(continued on page 2)

The Warm-up can also include a more advanced “riddle” that is based directly on concepts in the given course material, but asks students to function at the level of hypothesis. Students are not graded just on correctness of response, but rather on the quality of their “best guess.” Those guesses provide insight to the instructor on how deeply students understand the concepts. For students, the genuine intellectual challenge coupled with lack of pressure to “get the right answer” makes the exercise entertaining as well as instructive.

A New Role for the Instructor

About two hours before class the instructor checks the designated e-mail folder or website to review students’ Warm-up responses. She skims for patterns of success or struggle. With practice, she can review 100-200 responses in just a few minutes, and select a few attempts to show overhead in class to start discussion. This sampling will include

Because students drive the learning, they are more likely to have a proprietary interest in what happens.

two or three interesting “close but not exact” responses and perhaps one or two “excellent” responses. For concepts that appear more difficult for students, she will collect several “good try” responses and use these as an entry into class discussion.

Once in class the instructor briefly reports to students on what they mastered, then uses

Gains in class time can be used to target students’ skill in transferring concepts, analyzing problems, and evaluating data.

the selected student answers to solicit analysis from the students themselves, or to guide her comments about problem areas. Because the classroom activity is now driven by the students, themselves, they become more likely to have a proprietary interest in what happens.

Student-Driven Learning

Now that students are partners with the instructor rather than reluctant followers, they are more disposed to self-direction and self-sufficiency. Since the Just-in-Time approach greatly reduces the need to cover content in class, the gains in class time can be used to target students’ skill in transferring concepts, analyzing problems, and evaluating data. Novak comments that “Exactly how the classroom time is spent depends on a variety of issues such as class size, classroom facilities, and student and instructor personalities. Mini-lectures (10 min max) are often interspersed with demos, classroom discussion, worksheet exercises, and even hands-on mini-labs. Regardless, the common key is that the classroom component, whether interactive lecture or student activities, is informed by an analysis of various student responses” (www.jitt.org).

An Important By-Product

An unexpected consequence of Professor Novak’s original experiment is the dramatically increased level of student enthusiasm generated by the new structure of the class.

This appears to be true whether the Warm-ups count toward the students’ grades or not. On the one hand, the process helps average-performing students discover the need to study the readings before class so as to better master the concepts. Without the Warm-up, they will most likely remain unaware of how far their reading comprehension falls short of the mark. On the other hand, advanced students find it interesting to attend class to confirm their understanding and to see if their “best guess” at the puzzle might be accurate. In both cases, students discover an incentive to come to class better prepared and more engaged, resulting in a learning environment that is inherently more dynamic and productive.

Detailed information about JITT can be found at www.JITT.org. There are low-tech applications as well as high-tech applications, but all are built upon the shared principle that students will engage in self-directed learning when the opportunity for effective, non-punitive feedback is an integral part of the learning process.

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The Institute’s Services Include:

- Support for course and activity design
- Support for curriculum innovation
- Campus workshops and consultations on teaching and learning
- Facilitated conversations on demand by departments and programs
- Teaching feedback services
- Conversations and seminars on Faculty Leadership



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