

# Just in Time Teaching and Active Learner Classroom

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# What I'll Say

- Describe Just in Time Teaching (JITT)
- Define Active Learner Classroom
- Implementation

# Just in Time Teaching (JITT)

- Basically, in JITT, students respond electronically to “well-constructed” web assignments due shortly before class. The instructor reads the submissions *just in time* to adjust the classroom lesson to suit students’ needs. A feedback loop is formed between students and instructor
- JITT is a method of instruction in which the emphasis is placed on *student learning*, and not on teaching.
- Two main Goals are
  - maximize the efficacy of the classroom session, where human instructors are present.
  - structure the out-of-class time for maximum learning benefit.

# JITT—Feedback Loop

- Web assignments fall into three types
  - Student assignments in preparation for the classroom activity: Warm ups.
  - Enrichment pages. Short essays on practical, everyday applications of the course subject matter, with URLs to interesting material on the web. These essays can be an important motivating factor in introductory service courses, where students often doubt the current relevance the subject.
  - Stand alone instructional material, such as simulation programs and spreadsheet exercises.

# JITT—Feedback Loop

- Warm ups
  - These are short, web-based assignments based on a reading assignment, prompting the student to think about the upcoming lesson and answer a few simple questions prior to class. These questions, when fully discussed, often have complex answers. The students are expected to develop the answer as far as they can on their own.
  - Students complete the Warm up assignments before they receive any formal instruction on a particular topic.

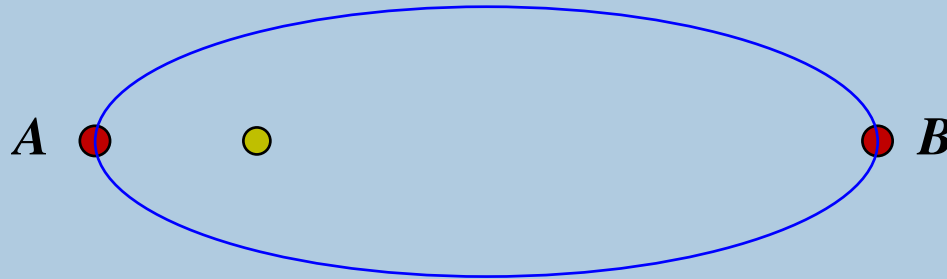
# JITT—Feedback Loop

- Questions on Warm Ups are informed by (physics) education research
  - Probing conceptual understanding
  - Building vocabulary
  - Modeling
  - Connecting concepts to equations
  - Understanding the scope of equations
- Always asked: Name two things that were unclear from the reading.

# JITT—Feedback Loop

- Student responses are received before class time. That day's activities are then modified based on responses.
- A reading quiz often begins a class session. This helps motivate students to read the material.

# JITT—Examples (Physics)



A planet's orbit around the sun is an ellipse. At points A and B how does the centripetal force exerted on the planet compare. How about the potential energies at the same points? Kinetic energies? How about the angular momenta?



# JITT—Examples (Ethics)

- What kind of community is the state?
- What are the two relationships that can't exist without each other? What arises from these necessary relationships?
- What method is used by Aristotle for this study?
- How and why does the state come into existence?
- How does Aristotle characterize a man without a state?
- Explain the meaning of the phrase, "the state exists by nature". What is the argument

# JITT—Examples (Psychology)

- A psychologist interested in political behavior measured the square footage of desks used by a sample of state governors and a sample of CEOs. She found that the average square footage of desks of governors was 45, with median of 36 and SD of 12.5 while the same statistics for the CEOs were 45, 44 and 6.2, respectively. Interpret these data about desk size for governors and CEOs for one who is not knowledgeable about statistics
- A blood test is taken and the levels of several different components are taken. For example the sodium, chloride, calcium, the LDL and HDL levels are measured. Which of the following blood components is considered to be most extreme for this sample? Why?
- Sodium=142 with  $M=140$  and  $SD=5$ , Chloride=113 with  $M=106$  and  $SD=6$ , Calcium=9.5 with  $M=9.2$  and  $SD=0.7$ , LDL=118 with  $M=85$  with  $SD=20$ , and HDL=79.6 with  $M=60$  and  $SD=10$ .

# JITT—Active Classroom

- The warm ups and reading quiz have prepped the student for the day's activities.
- The feedback from the warm ups and the “*two things I didn't understand*” question have prepped the instructor for the day's activities

# JITT—Active Classroom

- Active classroom sessions are intimately linked to warm ups.
- Classroom time use varies, but includes
  - Mini-lectures (10 min max) are often interspersed with demos
  - classroom discussion
  - worksheet exercises
- Feedback is continually solicited and regardless of classroom component, it's delivery and content are informed by an analysis of student responses

# JITT—Active Classroom

- Students work in groups of 3. Literature is mixed on whether groups should be scrambled from time to time during the quarter.
- Depending on student online responses, an activity follows. Each group discusses, debates, and reaches consensus. They are asked to summarize on a portable white board. This is shared with the entire class. I make an assessment on the fly.
- A mini-lecture usually follows in which the learning is re-presented. Problem areas (as assessed above) are especially emphasized. Feedback is immediate

# JITT—Active Classroom

- Process repeats. Typically different types of classroom activities occur in a single session, eg, worksheets, demos, two-minute problems, etc.
- Session ends with a recap mini-lecture of the learning that occurred that day, sometimes a minute paper is assigned.

# JITT--Implementation

- Use resources!
- Start slow, I started just by asking students to submit two things they did not understand about readings, then moved to active classroom
- You cannot cover as much material, but you can cover the important, fundamental content in such a way that students gain greater depth.
- Studies show improved DFW rates, improved performance on pre- post-tests assessment, and improved attitudes about science learning using JITT and active classroom pedagogies.

# JITT--Resources

- <http://www.elon.edu/docs/e-web/academics/teaching/tlconference/JiTT%20Handout%20-%20August%202012.pdf>
- <http://jittdl.physics.iupui.edu/jitt/>
- <http://web.mit.edu/jbelcher/www/PhysicsNewsLetter.pdf>