

Faculty Inspiration & Goal of PFL

Inspiration

-I was motivated by Dee Silverthorn's colloquium. She gives her students assignments on the material prior to class.

- I thought of taking the learning goals for the lecture and create prepare to learn activities.

Goal

-To ensure that the learning goals were addressed in the course

-To have students work with the basic concepts via the PFL activity at home so that lecture could be used to go in depth with material in lecture

Example PFL At Home Activity

Prepare to learn for February 3, 2009 (Chapter 5)

1. Determine the direction in which net diffusion of non-polar molecules will travel in a solution.
2. Recognize the concept of equilibrium as it applies to two compartments separated by a permeable barrier, one filled with a high concentration solution and one with a low concentration of solution.
3. Explain why channels are necessary cell structures for polar molecules to diffuse across the plasma membrane.
4. Become familiar with the concept of electrochemical gradients and be able to identify the two factors that determine diffusion of ions across a membrane.
5. Define the terms passive diffusion, facilitated diffusion, and active transport based on cellular energy requirements.
6. Define the following terms: Phagocytosis, endocytosis, exocytosis, osmolarity, resting membrane potential, carrier mediated transport

Example PFL Clicker Question (In-Class Portion)

Which of the following would increase the net rate of diffusion of an uncharged solute across a cell membrane?

- a) An increase in the electrical gradient
- b) An increase in membrane thickness
- c) An increase in the chemical gradient
- d) An increase in molecular weight of the solute
- e) A decrease in the temperature

Organization of PFL Activity

1. PFL Activity Uploaded to CU Learn Prior to Lecture

2. At Home Portion: Students answer PFL activity
(guided reading of text with questions)
Frequency:

3. In Class Portion: Graded Clicker Questions
related to at home PFL activity
Number of Clicker Questions:

Exam Results: Sp '08 vs Sp '09

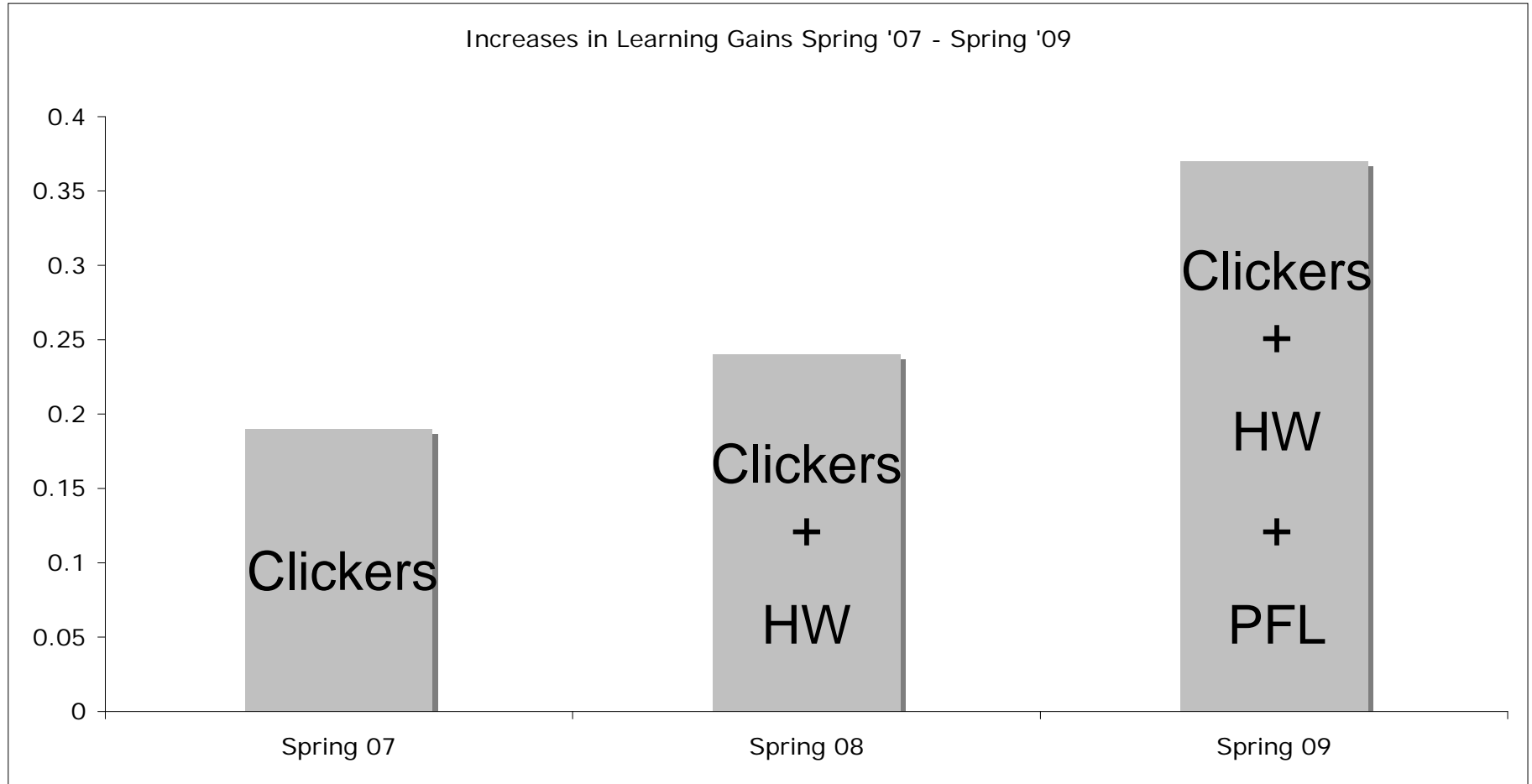
	Spring '08	Spring '09	
Exam 1			
Total (percent correct)	78	80	
Exam 2			
Total	76.3	76.1	
Same Q	76.9	79.1	
Different Q	73.4	63.1	← New questions at higher Blooms Level: application
Exam 3			
Total	80.8	76.7	
Same Q	80.2	77.4	
Different Q	80.9	74.9	

75 question multiple choice exams

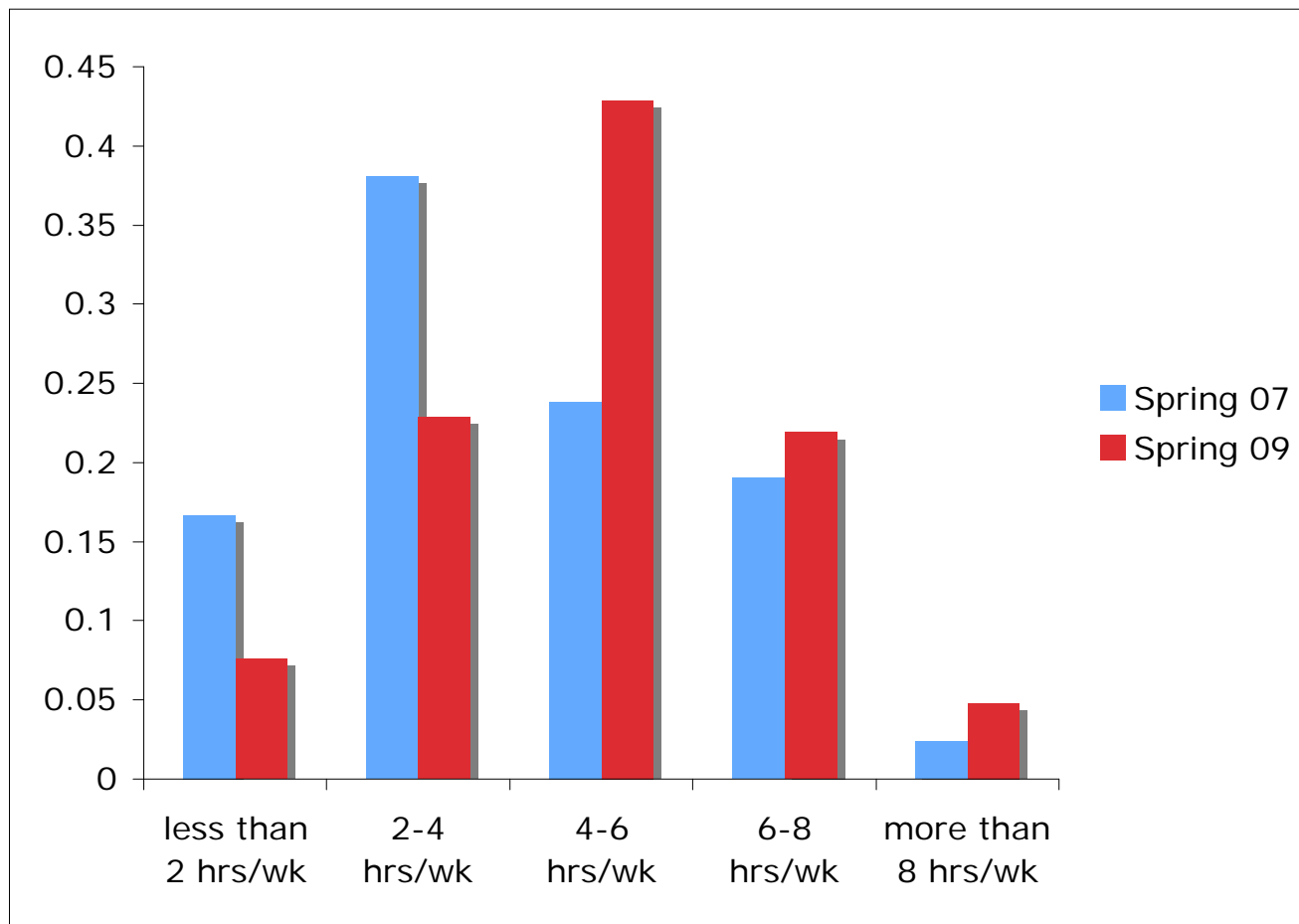
Same Q between Spring 08 - Spring 09 = 80% of exam

Different Q between Spring 08-Spring 09 = 20% Exam

Pre-Post Assessment Learning Gains



Students Spent Two More Hours/Week compared to previous semesters

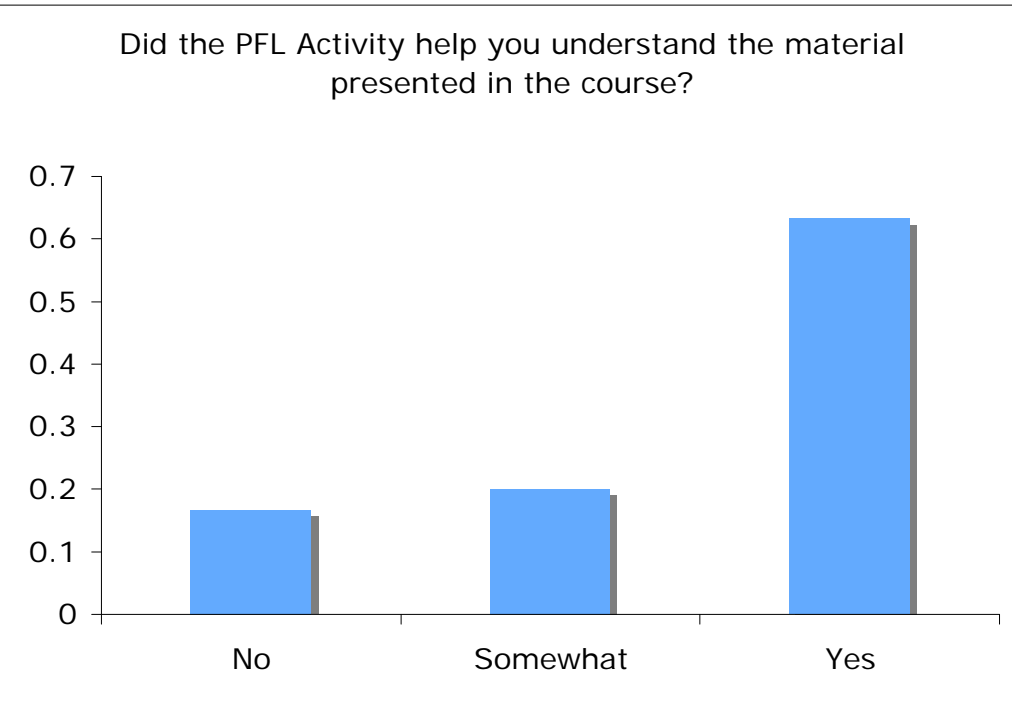


Representative Comments from Students

No: “I think it is more useful to read the book after lecture to reinforce the knowledge once you have a good understanding about it rather than reading it and not understanding as much. “

Yes: “It helped because you had a running start on the material, you were already in 1st gear coming to class instead of starting neutral and then getting in gear.”

Yes: “Having already looked at and read the material (in order to answer the PFL questions), lecture was a review of the information, meaning I was able to better consolidate the info in my brain the 2nd time through”



Conclusions & Discussion

The addition of Prepared For Learning to IPHY 3470 allowed students more **guided practice** with material.

Possible Mechanisms:

- Allowed students more opportunities to consolidate the material/concepts.
- Allowed students to create questions prior to lecture so that they were cued in during lecture.

Evidence:

- Increase in weekly time spent on course.
- Increase in learning gains in Spring '09.
- Positive student attitudes and feedback on PFL activity.