

Asynchronous Group Problem Solving

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Overview

- Students use Livescribe smartpens to record and share think-alouds. The second part of the assignments asks students to offer feedback to each other that focuses on the problem solving process.
- We are in the earliest stages of this project both in our development of materials and analysis of preliminary data.



Motivation

- Improve students' problem solving skills
- Create cohesion among assigned student groups.
- Encourage students to collaborate on problems outside of class.
- Experiment with new technology (because that's fun)

Description of course and students

- Physics for the life sciences.
- First semester course covers classical mechanics and some fluids and thermo.
- Two sections, with approx. 30 students each

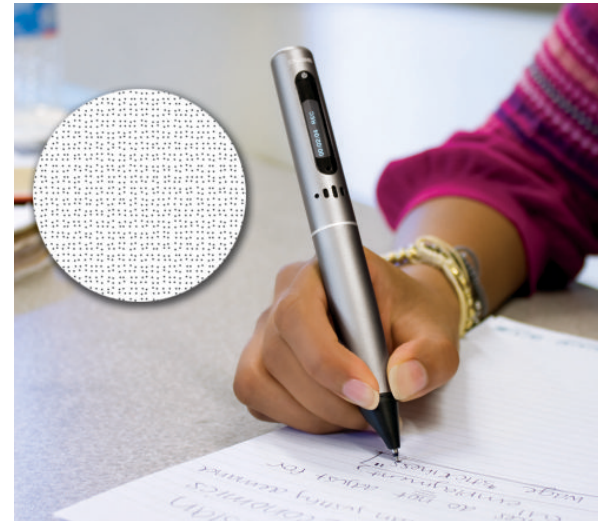
- Average pre-instruction scores:
 - $FCI = 8.0 \pm 4.0$
 - “Lawson Test” = $71 \pm 16\%$

Asynchronous assignments

- One for each of the five units
- Students were asked articulate their thinking while solving the questions
- Questions were generally *problems* for the students
- After solving the problem, students gave their groupmates feedback on the uploaded solutions
- Students received credit for the assignment if they completed both portions of the assignment.

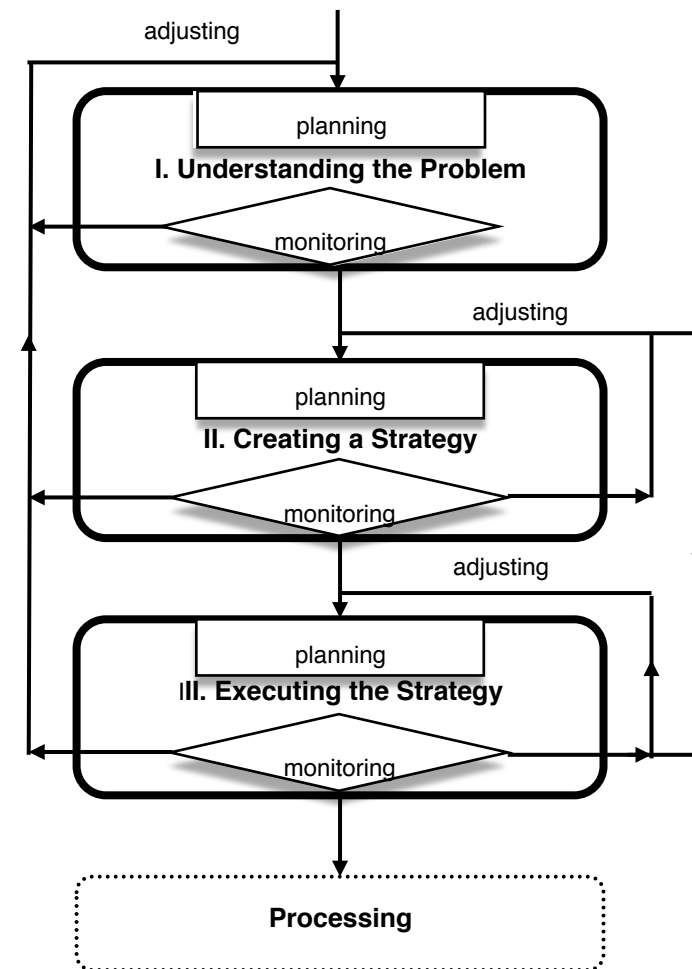
Technology

- Recordings were made with Livescribe smartpens
- Students then upload their recordings to the course website
- In the feedback segment, students filled out online forms for their groupmates and selves.



Problem solving feedback

- Our model of problem solving was inspired by Polya and Schoenfeld.
- For each part of the problem solving process, students reviewed how well the recorder planned, monitored and adjusted their thinking



Sample pencasts (recordings)

Student surveys

- Students completed a 60-item survey related to problem solving and overall course motivation and self-efficacy pre and post-instruction.
- Improvements were seen on the problem solving motivation, planning and adjusting clusters, but a deterioration was seen in the monitoring cluster.
 - **Planning**
 - I find that I'm most successful at solving word problems if I quickly jump in and start working with some equations.

Observations and plans

- Livescribe pens make the recording, sharing and analysis of think-alouds easier to do.
- Research students have yet to analyze the survey results, think-alouds, feedback and in-class tests.
- We want to improve the instruction and training for making think-alouds and providing feedback.
- We are in the process of collecting and cataloging recordings for physics, mathematics and chemistry.

Thanks

- If you would like more information about this work, please email me (jphillips@lmu.edu). You can also visit the LMU PER website
 - <http://myweb.lmu.edu/jphillips/PER>
- The SoCal section of AAPT will have its Spring meeting at CSU- San Marcos April 21.
 - <http://www.scaapt.org>