Problem-solving Examples with Narration for Students (PENS)

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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.

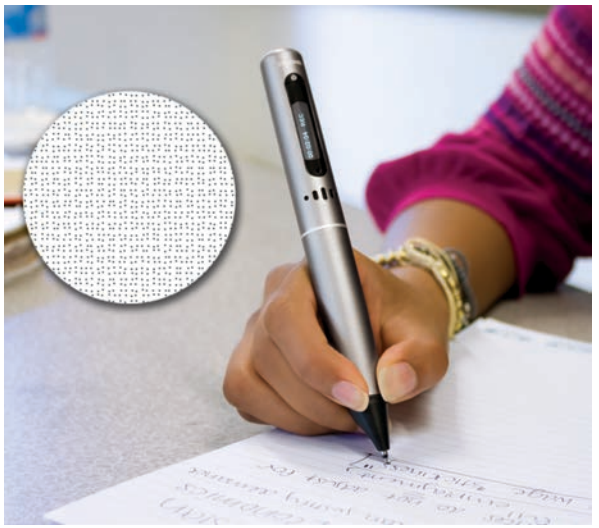
- Experiment with new technology (because that's fun)

Asynchronous assignments

- 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.

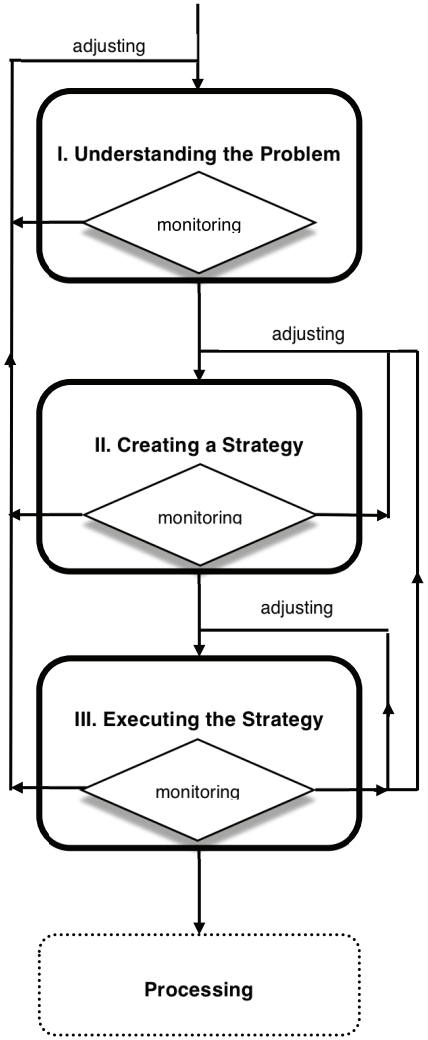
Technology

- 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)

- http://bit.ly/PENS-sample1
- http://bit.ly/PENS-sample2
- http://bit.ly/PENS-sample3
- http://bit.ly/PENS-sample4
- http://bit.ly/PENS-sample5

Student surveys

- Students completed a 60-item survey related to problem solving and overall course motivation and self-efficacy pre and post-instruction.
- In 2011, improvements were seen on the problem solving motivation, planning and adjusting clusters, but a deterioration was see 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), stop by Seaver Hall, or the LMU Physics Education Research website:
  - **http://myweb.lmu.edu/jphillips/PER**