PER Seminar

AAPT/PERC debrief

Monday
August 31, 2009

Dong-Hai Nguyen

My interested topics:

- Marzano's new taxonomy of educational objectives

- ACCESS – a problem-solving protocol based on cognitive processes

- Use of non-traditional (diverse) problems

- Revisit study of Chi related to categorization of introductory physics problems

- Effect on student performance of different pedagogical methods

- Topics related lecture demonstrations

- Course reform in introductory physics

Relevant to research:

- Support multiple representation through dynamics representation in physics models.

- Use of eye-tracker to track student attention on provided data.

Chris Nakamura AAPT/PERC Debrief

Interesting:

David Maloney:

Research on Problem-Solving: Problems and Exercises differ. Expert-novice question: Are experts and novices both solving problems? Or is the expert doing an exercise while the novice solves a problem?

Charles Henderson & Denise Harper:

Reflected on their solutions to problems from Reif & Allen's paper on expert-novice problem solving. Both provide interesting portrayals of expert difficulties.

Important for me:

Many (e.g. Doug Brown) people talked about computer modeling & video data acquisition/analysis. Often argued that the learning curve was not a big issue, but I didn't see data either way. I want to look into the literature to see if there is research on how long it takes students to learn to use new computer tools, how much it impacts cognitive load, and how they feel about doing so.

SYTIL

- Teaching by Cycling at CWRU and YSU (DF08)
  - In one semester – go through all material of course three times (more in-depth each time)
  - Why and Challenges, but no data on benefits
- Writing for TPT (BD01)
  - Demographics on who is published
  - Do's (and Don'ts)
  - Stress on the importance of the 1st paragraph

Mojgan –AAPT Summer 2009

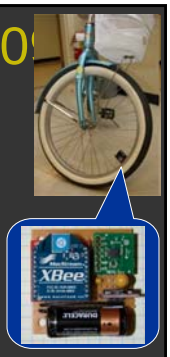
Andrew Heckler/ Pre-test and Post test

- Students' knowledge changes over quarter of week
- Response curves structures
- Peaks/Decay/Minimum
- Model changes cognitively and mathematically
- Learning/Forget/Inference
- Inference B&E field instruction
- Half upper and lower students

Andrea diSsesa- Causality in Pieces

- Cold glass and room temperature
- Things should balance out
- Balance out=big deal Degree of imbalance/activation
- Agency (freaking out, work harder) *higher agency*
- Close to equilibrium (calm down) *lower agency*
- Causal chaining/ Causal interpolation

Nasser - AAPT Summ. Mtg. 200



- Interesting Talk
  - XBee RF Module (with A/D converter)
  - Cheap (few $), Wireless (Range ~100 m),
  - Using a 3-axis accelerometer board the XBee Module can be used to meas. Position, Vel. & Accel.
  - Links
    - http://phys.csuchico.edu:16080/ayars/XBee/Welcome.html
    - ftp://ftp1.digi.com/support/documentation/90000866_C.pdf
- Info. relevant to the PMI Project
  - Consult with & involve faculty in Advanced Labs to ….
    1. Get advice & their expectations for Research Assistants
    2. Bring their expertise – to keep the Adv. Labs Innovative & Modern
  - Students do NOT learn much when doing cook-book experiments, so students should be encouraged to explore and modify experiments accordingly
  - What happens to Students performance between the Pre- and Post-Test?

Nasser Juma

Jackie

- Related to research (it's interesting, too?)
  - In discussion: Check post-test scores after removing Q's that led to difference
  - Lasry: Studied different ways to use Peer Instruction and found testing yields gains (we use many tests!)
  - Qualitative Analysis Workshop
    - Can express qualitative data in many forms, including graphs
    - Group video watching
    - Recommended book: Lincoln and Guba, *Naturalistic Inquiry*

AAPT Reflection- Carmichael

Interesting

-Creation of set for Big Bang Theory

-Schwartz and transfer

-Not allowing time to learn deep structure destroys transfer
-Learn deep structure then direction instruction is okay

Relevant

- Methods in Cognitive Science Seminar

-Intro to various methods (eye-tracking, brain imaging etc.)
-Tool to inform us about cognition.
-Would like to use advantages of CPR in my research

PER: Open ended, real setting, longer studies, real physics tasks, hard to show cause/effect

CPR: clinical labs, short (~1hr), "toy tasks," pinpoint cause

- Adam Smith/Jose Mestre Eye Tracking Study

-Practical tips on designing eye-tracking studies.
-Left/Right, don't just "see where they look." Manipulate.