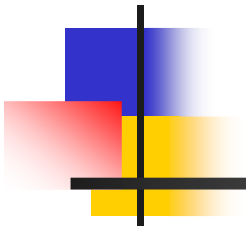


PER Seminar

Group Meeting

Monday
October 12, 2009

Jackie

- PWorld Pulley Implementation
  - same as last year; results look similar
- Concepts of Physics pulley implementation
  - Tests more spread out (pre- and post- in class)
  - Students chose order (physical or virtual first)
  - Added wrap-up questions comparing PM and VM
  - Added survey asking whether students would use PM or VM to make various decisions
- Upcoming
  - Pworld Inclined Plane Implemenation
  - Interviews with students using PM for inclined planes with no directions/worksheets (like Adrian's summer interviews)

Pathway-ALE project: Alive ‘n’ Kickin’

News:

- New Great Name - Same Great Physics
- First SI is ready for initial testing! Would you like to (be willing to) ask it some questions?

Ongoing Efforts:

- Shooting level II responses (Nasser this a.m.)
- Editing video
- Designing videos/applets/animations for level III

Timeline: Have something testable for Spring ’10

PMI Project

- Working on writing a Paper on the SOL Capstone Project for publication in the IEEE transactions on education Journal.
- Work on other Capstone Projects
  - Saturated Absorption
  - X-ray Spectroscopy
- Reading more about complex problem solving to get an idea of what I should be looking at when designing the Pre- and Post-test questions and while collecting other data.

(Main reference :- David H. Jonassens's book "Learning to Solve Complex Scientific Problems")

Adrian Carmichael

Eye Tracking Project

- Current Progress
  - Gathered expert and novice volunteers
  - Decided on physics problems where the picture is important
  - Created interview protocol
  - Began expert interviews
- Future work
  - Continue expert/novice interviews
  - Synthesize information learned from interviews to guide actual eye tracking experiments

Dong-Hai's slide – Research update 10-12-2009

Students' difficulties with problems in multiple representations in Electricity

- Students did not have a picture of the problems, so did not know what to start with.
- Students' representational preference is: pictorial, mathematical, verbal, graphical representation.
- Students did not understand the meaning of each term in formula, so they had trouble when the context of the problems changed.
- Students had better understanding on relation between integral and area under graph compared to interviews in Spring, but still didn't understand the geometric meaning of integral, hence didn't know which graph to find area or didn't know what to take integral of.
- Naïve thinking of integration: integral of product/division is product/division of integrals.
- Students had difficulty manipulating algebraic transformation and simplification. Some students needed help with subtracting two fractions.

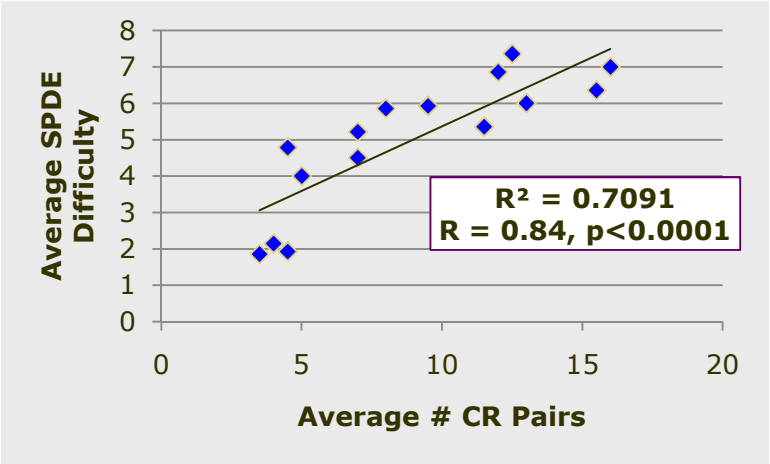
Liz Gire

Familiarizing myself with projects…

- **REESE Project (Dong-Hai)**
  - Created problems for 2 sets of interviews
  - Observed 11(17?) Teaching Interviews
  - → Evidence of Geometric Reasoning
- **Eye-Tracking Project (Adrian)**
  - Settled on initial study design
  - Selected problems for interviews/eye-tracking study
- **COMPASS Project (Jackie & Adrian)**
  - Pulley experiments in Concepts & P World
  - Epistemological questions about sources of data
  - → Analyze summer Inclined Plane interviews for ICLS proposal
- **PMI Project (Nasser)**
  - → Review research of unstructured problem-solving

Liz Gire

- **Problem Difficulty & ECR Framework**
  - Created SPDE & Administered to instructors (seminar)
  - Created an ECR Scoring Rubric and conducted a reliability study (seminar)
    - Example Reliability = 0.79
    - SPDE Reliability = 0.72
  - Correlation study of ECR Scoring & Instructors' difficulty rating



  - Revised ECR Scoring Rubric → Redo Reliability Study

→ Give SPDE to students - Phys 122

→ Score EP1 exam with ECR and compare with % correct