

PhysTEC Teacher Advisory Group Meeting December 9, 2004

Attendees:

Mike Dubson
Noah Finkelstein
Steve Reeves
Valerie Otero
John Evans

Mike Fuchs
Steve Iona
Roberta Tanner
Chris Keller
Stephan Graham

Paul Miller
Trish Loeblein
Kathy Perkins
Steve Pollack

Announcements:

- Noah Finkelstein is a member of the PhysTEC National Meeting Planning Committee
- Roberta Tanner has developed a course and student manual on Microchip Interfacing and would like some help reviewing the manual and finding venues for workshops and dissemination
- Steve Iona would like some help revising the Physics Day at Elitch's Booklet
- Mike Fuchs described his work at Boulder High School to involve students in the FIRST Robotics Competition.

PhysTEC Goals/Approach

PhysTEC looks to increase the number of physics majors going into teaching, supporting reforms in undergraduate coursework, parent with local schools and research these activities. See <http://phystec.colorado.edu>
University of Colorado is one of seven sites funded by The American Physical Society.

General Discussion:

- How much is the Physics Department invested in PhysTEC and reform efforts?
Essentially all of the instructors working with the freshman level physics classes are committed to reform efforts. Approximately one-third of the physics faculty are genuinely interested in curriculum reform efforts; approximately one-third of the physics faculty are genuinely not interested in curriculum reform efforts.
- An advantage of the connections being established through PhysTEC is that students from partner schools could contact Mike Dubson, Noah Finkelstein, or Steve Pollack for assistance.

Reports of Activities

Physics 1120 – Calculus-based Electro-magnetism

- Use of University of Washington Tutorials directed by seven Learning Assistants: three new, four returning and four students from Physics 4810-Teaching and Learning Physics. 50% of the enrolled students expressed “discomfort” with the Tutorials. 10% of the enrolled students expressed “extreme discomfort” with the Tutorials. Steve Pollack referred to this as the “Spinach Model of Education.”
- Research questions being investigated include: Why do students feel uncomfortable with the Tutorials? What are the positive effects regarding physics understanding based on the use of the Tutorials? Are the uses and associated learning gains from the use of the Tutorials transferable to settings outside of the University of Washington?

C-LASS – a survey designed to measure student beliefs regarding nature of science and problem solving. Some initial findings include:

- Learning gains correlate with the level of expert beliefs held by students.
- Students in reformed classes tend to maintain pre-test belief levels; students in non-reformed classes tend to move away from expert belief levels
- What characteristics of courses might be responsible for a drop in CLASS scores?

Student observations at Boulder High School and Stanley Lake High School:

- Positive aspects: the classroom teacher worked harder to be accurate, he enjoyed the collegial relationship, and he enjoyed the assistance in setting up laboratory experiences
- Negative aspects: some observing students were too close to the stereotypic physicist image
- An observation schedule 1-2 times /week seemed adequate, 10 hours/week seems to be too much.

Several teachers are using the PhET applets – especially The Moving Man and The Mass on a Spring. It was reported how important it was to carefully embed the use of the applets in an instructional plan and not just “turn the students loose.” One teacher designed pre/post test questions.

Discussion of TiR and Fellows Job Postings

- There were several clarifying questions regarding the positions and general interest in applying for the positions.
- Methods for distribution were discussed: general email to Denver, Area Physics Teachers, through science supervisors in districts, through the TAG members.