Using a Model Undergraduate Learning Laboratory for Teaching Real-Time Embedded-Systems Networking

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ROBOTICS: HS TEACHERS & STUDENTS
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In order of prevalence, student knowledge encompassed understandings about:
- Instruments/equipment (computers, electronics, related software, and programming)
- Tacit knowledge (learned from other people and specific to certain hardware, software, workplace, manufacturer)
- Contingent knowledge (things that worked “here”)
- Informal knowledge (rules of thumb, common practice)
- Meta-knowledge (about how this professor or dept. operated)
- Formal knowledge (ideas codified in theories and equations)

Thus, formal knowledge - the usual focus of engineering coursework - fit into a web of understandings about RT/ES Networking learned during the course.

TEAM ACTIVITIES
With direction from engineering professor & mentoring from student engineers, 9 teams of 1 HS teacher & 2 students used two-PC lab stations to learn about:
- Robotics
  - Set up of computers & software
  - Assembled robot
  - Completed 4 instructor-provided robot labs
  - Continued independently with advanced robot movement activities, using “whiskers” and IR (infrared) sensors
- Attendant technologies needed for college success
  - Used WSU on-line coursework and webmail systems
  - Performed on-line library research
  - Practiced digital video camera operation
  - Learned video-editing & created a DVD of robot capabilities
- Teachers returned to their schools with Parallax Boe-Bot™ Robot and 2 trained assistants for teaching about robotics. Via essay contest, 3 students awarded robots used for course development.

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