REAL-TIME, EMBEDDED-SYSTEMS NETWORKING: KNOWLEDGE, LEARNING, AND ACTIVITY
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This poster presents preliminary findings from the UNDERGRADUATE COURSE, one of five activities of the RT/ES Networking Project.

THE RT/ES LEARNING LAB
The lab contained 6 computer stations and ultimately, students used 4 different boards or sets of equipment. Lab layout positively influenced student activities by allowing:
• Ease of communication among teammates (side-by-side),
• Ease of communication between teams (especially Team 5 to 1, 2, 3),
• Space to place student resources on counters, allowing simultaneous access to Internet, MP Board, library/text media, and other resources.

In particular, facilitating social interactions proved central to learning.

STUDENT LEARNING PROCESSES
Student learning proceeded via a complex process:
• Students entered with funds of knowledge from prior experiences (family/community, industry, and education);
• Classroom assignments/coursework were interpreted using earlier understandings;
• New understandings emerged via recognition for things working, affirmations from collegial & technical resources, and "right answers" from the professor;
• Via teamwork and inter-team interactions, more knowledgeable students became resources for others.

Thus, work in the lab proved considerably more central to learning than did classroom lectures.

STUDENT KNOWLEDGE
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.

Using a Model Undergraduate Learning Laboratory for Teaching Real-Time Embedded-Systems Networking NSF-DUE-CCLI: 0632890: Yaprak, Tonso, & Mahmud