Victory Lap in St. Louis

IT IS ONE MONTH BEFORE THE COMPETITION, AND students at Tidewater Community College in Virginia Beach, Va.., have hit another roadblock. Who knew that the transistor would overheat? Scott Smith, a sophomore computer engineering student, suggests "We could heat-sink the transistor to the chassis." Teammates Dave Gary and Robyn Walker fear that plan may cause a ground problem. The textbooks never seem to deal with practical problems like motor noise, current limitations, and overheating.

What these engineering students are sweating over is the design and building of a tiny race car they hope will leave their competitors in the dust. They are also getting hands-on design experience, which doesn't always happen at the community college level. Many engineering students at two-year schools are studying part-time and have busy schedules, and faculty members often feel that they lack the time and resources to get them involved in significant design projects. But one of the ways that community colleges can provide this vitally important experience is through national competitions.

Tidewater Community College sophomore Norm Doyle puts the finishing touches on a battery-powered car.

Tidewater's engineering department considered several design projects before settling on the battery-powered car competition, which is sponsored by the American Society for Engineering Education. The specifications for the competition are just right—difficult enough to pique interest, but not too difficult to be discouraging.

The competition is held each June during ASEE's annual convention. The rules call for building a battery-powered vehicle of a certain size that can navigate a plywood track, which includes features such as inclined surfaces and a line of black 3/4" electrical tape that aids optical sensing. Although the fastest car earns the most points during the speed test, teams also earn points based upon written reports, CAD drawings, and oral presentations before a panel of judges.

However, finding the time for extra activities can be particularly difficult for community college students, who are often older and have more commitments than students at a typical university. Robyn Walker, 36, balances a full-time secretarial job with a heavy load of courses as she seeks to pursue a new career in engineering. "I was really interested in getting involved, but engineering was so new to me that I didn't think that I would have anything to offer," she says. "I was pleasantly surprised at how willing the other students were to explain things to me and how open they were to hearing my suggestions."

The time investment is huge for both faculty members and students, but both sides agree it is time well spent. Engineering faculty member Steve Ezzell says that giving students an exciting taste of real-world experience makes it worthwhile for him. Dave Gary, a 29-year-old sophomore electrical engineering student who spent six years in the Navy as an electrician, says he learned much more from the practical design experience than he ever did in classroom lectures.

Projects like this can also teach students to solve problems creatively. TCC, like many community colleges, doesn't have the resources that larger schools do, so team members brought tools from home, shopped for parts locally, and learned to implement designs without expensive equipment.

After seven months of meeting two to three times per week, team members Walker, Gary, and Doyle, along with two engineering faculty advisors, packed up their gear and headed to St. Louis. The competition began with the design presentations, followed by the speed trials. Walker's confidence showed as she gave a presentation to the judges that included design details, electrical schematics, CAD drawings, a parts cost analysis, and more. But none of the students felt too confident at the speed trials.

Team members held their breath for the 28 seconds it took TCC's winning car to cross the finish line—and then pandemonium broke out. The TCC team—the defending champions from the 1999 competition in Charlotte, N.C.—had won again in St. Louis. As these victories clearly show, even small community colleges can create challenging and rewarding design experiences that get students excited about engineering.

To see race videos, pictures, presentations, and rules, see www.tc.cc.va.us/studorgs/vbeng/asee2000.

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