



Foresight in Surveying Education

Topcon's educational program reaches out to more than 500 institutions worldwide

—by Daniel C. Brown

As tax revenues have dropped, states across the country have had to lower their subsidies to colleges and universities. In the West and Pacific Northwest, several states have reduced their subsidies to higher education by 25 to 30 percent, says Jack Walker, chair of the Geomatics Department at Oregon Institute of Technology, Klamath Falls, Oregon. "Across the nation, higher education is being severely impacted by the recession," says Walker.

As a result, surveying schools find it nearly impossible to pay full price for today's high-end surveying equipment. Even in good economic times, it's difficult if not impossible for them to pay full price. Take a class of 25 surveying students, for example. If the instructor wants them to work in teams of three, that's about eight teams. If each team needs a \$50,000 GPS system, the total comes to \$400,000. Schools simply don't have that kind of money.

"Acquisition costs could be extremely high," says Walker. "Plus, there are multiple types of equipment, and every three to five years the equipment becomes obsolete as new technology emerges. You need to replace the equipment."

In 2005, upper management at Topcon Positioning Systems took note of this need for surveying equipment, especially GPS equipment, and launched the Topcon Educational Partnership Program. The program supplies colleges, universities, technical schools, and labor union training programs with state-of-the-art surveying equipment at educational discount prices. Topcon dealers sell the equipment, then provide training at a nominal rate. The Topcon Educational Partnership Program is a strong part of Topcon Corporation's Global Corporate Social Responsibility Program.

The program has succeeded beyond almost anyone's wildest dreams. In just a few short years, more than 500

educational institutions in North and South America and in Europe have been supplied with Topcon surveying and GPS equipment. In the United States, 153 colleges and universities had bought Topcon equipment as of January 2009.

"I'd say we use Topcon equipment in close to 20 courses," says Walker. "Topcon has been enormously helpful in allowing us to teach students with state-of-the-art technology."

The University of Maine was one of the first schools to benefit from the Topcon program. "We got our first Topcon GPS system in about 2005," says Raymond Hintz, PhD., professor of Surveying Engineering Technology at the University of Maine. "We have two complete sets of HiperLite + GPS systems—two bases and two rovers. We have used them in "Practical GPS," "Advanced Practical GPS," "Advanced Surveying," "Surveying Capstone," "Adjustment Computations," and "Practical Field Operations."

The University of Maine offers a four-year degree program in surveying. "We are 100 percent Topcon here," says Hintz. "And Spiller's, our local dealer, has had a lot to do with it." What goes into a decision to choose certain survey instruments? "Price, quality, and service," says Hintz. "I go with the people and the systems that don't give me any problems."

Hintz says that eight months ago, the university bought three base stations and three rovers of Topcon's line of GR-3 GPS equipment. "Over the years we've had about 10 total stations from Topcon, and we own two of their digital levels and four construction laser level systems," says Hintz.

In the past, the University of Maine received funds from the U.S. Bureau of Land Management (which conducts cadastral surveys on federal lands) to enhance BLM's ability to hire four-year degree students from the university. The money the university received from BLM was used in a variety of ways, including for the purchase of survey equipment."

"I think Topcon's educational program is great, but it's really the people who make it such a success," says Hintz. He has special praise for Dominick Auletto, the former vice president of business development at Topcon and the man who started and built the program to its current size. "Without Dominick I doubt this all could have happened," Hintz says. He also credits Topcon CEO and president Ray O'Connor, Topcon's Hank Boudreau, the northeast regional manager, as well as Russ Desjardins at Spiller's."

How it all unfolded

Topcon started the program by focusing on schools with four-year degree programs in surveying. Top priority was given to large schools such as the University of Maine, Oregon Institute of Technology, New Mexico State, Penn State, Ohio State, the University of Connecticut, and the University of Florida. The program was then offered to engineering universities offering surveying courses and to two-year associate degree programs in surveying. In all there are 25 schools in the program.

"The next phase of the program was geared toward training schools sponsored by labor unions," says Auletto. "We first targeted the Operating Engineers and later included members of the Laborers' International Union of North America."

The package of equipment originally formulated for the Operating Engineers was Topcon's GR-3 Pocket 3D GPS system. The package included one set of GR-3 receivers, an FC-200 data collector, and two sets each of software: the G3 Glonass L1 L2 Tracking; the G3 GPS L5 Tracking; and the G3 Galileo Tracking. All base accessories and rover accessories were included as well.

"Part of the Operating Engineers' package was machine control software for heavy equipment," says Auletto. Topcon dealers installed the software on their bulldozers, motor graders, and excavators, and this was followed with a GPS package from Topcon which works in conjunction with the heavy equipment.

"Word of the program spread quickly among surveying professors at universities and colleges," said Auletto. It all happened by sharing experiences with the Topcon Education program, not advertising. Tony Trujillo, president and general manager of Holman's Inc., a Topcon dealer in Albuquerque, New Mexico, said Holman's has provided equipment to three colleges in New Mexico, one in Colorado, and one or two in Arizona.



Students at Oregon Institute of Technology collect a point with a GPS receiver.

The Central New Mexico Community College participated at four levels of equipment acquisition. The first-tier equipment included theodolites, levels, and total stations. These were followed by GPS equipment, GIS hand-held units, and, finally, Topcon's Net-3 equipment for use with a GPS network. "The City of Albuquerque has several GPS networks, and a surveyor can use the city's base stations to reference his own control points," Trujillo says.

At Purdue University, the Department of Civil Engineering keeps at least seven Topcon total stations as teaching tools. In 1992, Purdue bought four total stations and 10 levels, and Topcon agreed to loan the university three total stations a year since then. Through Positioning Solutions, a dealer in Indianapolis, Topcon rotates those three stations out and provides three new ones each year. Plus, over the years Purdue has bought two more total stations, a Topcon 313 and a Topcon 605.

"They're good, solid instruments," says Steven Johnson, associate professor of civil engineering. "They get hard use in our sophomore class. Yet, they've been very reliable and have held up well even though they are often used by students who have no prior experience with such equipment."

Purdue also has bought a Topcon HiperLite + GPS system purchased from Positioning Solutions through Topcon's Educational Partnership Program, and although Johnson does not teach the RTK GPS class, he says that equipment is a real boon.

Johnson does not allow students at the beginning of their engineering education anywhere near the robotic total stations. "I want them to understand the math first," he says.



Students at New Mexico State University use Topcon HiperLite + equipment in the desert north of Las Cruces.



"If everything is automatic they don't know what they're getting. I don't want to automate their understanding of the underlying principles. The students can always graduate up to robotic total stations in our upper division classes."

GPS, a vital part of surveying education

"We've integrated GPS systems across the curriculum," says Steven Frank, an associate professor at New Mexico State University, Las Cruces, New Mexico. The university has a GPS course, but GPS equipment is used in other courses as well. Every class that has field exercises has at least one session using GPS.

New Mexico State has four Topcon HiperLite + GPS units purchased from Holman's through the EPP program.

"New Mexico is particularly suitable for GPS use because we don't have many trees to obstruct the signals from the satellites," says Frank.

The basic surveying course at New Mexico State is Survey 222—Plane Surveying. Others include Public Land Surveying Systems, Construction Surveying, Satellite Geodesy (the theory of how GPS works), and SUR 450, a senior-level project.

Students participating in the Plane Surveying course are required to run a traditional traverse using conventional surveying equipment and then run it using GPS equipment, for comparison. In addition, seniors are required to select and work on a real-world project to complete the course. "Last semester, we had 14 students in that course and they all used GPS as a part of their project."



It's a global, all inclusive Program

The European Union has three or four times as many universities offering a surveying education than does the United States, said the founder of Topcon's Educational Partnership Program, Dominick Auletto. As of January 2009, as many as 315 European schools purchased Topcon equipment, including 56 universities in Italy, 40 in Turkey, and 36 in Spain.

In the United States, 153 colleges and universities had bought Topcon equipment as of January 2009. In Canada, 14 schools were in the program, and countries in South America accounted for 26 participating schools.

Dave Reitmeyer is the owner and president of Productivity Products and Services Inc., in Saxonburg, Pa., noted that his dealership has delivered Topcon equipment to 24 colleges and universities in the U.S., including Penn State, Penn College, University of Pittsburgh, Allegheny Community College, Bluefield State College, West Virginia University, West Virginia Technical College, and Fairmont State. "My understanding is," added Reitmeyer, "that we have done more of these educational deals than anybody in the industry."

From the Carpenters' Training Center in Neville Island, Pennsylvania, to the Operating Engineers Local 66 training center in New Alexandria, Pa., to the Laborers Training Center in Saxonburg, Pa., to the Operating Engineers Training Center, Local 132, in Ravenswood, West Virginia, all have benefited enormously from Topcon's equipment for education. The program offers good value at reasonable cost, and that's why it is so much in demand.