A course in his senior year sparked interest in computation. It was an aerospace structures course that focused on finite element analysis of stresses and deformations in aircraft and space vehicles. “Of course our computer was a big, clunky IBM 360 and our programs were in boxes of punch cards, but I thought that was the coolest thing I had ever seen. None of us knew much about computers; we were still using slide rules. I was hooked.” To pursue it further, he enrolled in a Ph.D. program in aerospace engineering at the University of Michigan. His dissertation on computational techniques for fracture mechanics led to a postdoc that included a stint at a mining research center in Minnesota working on a computer model for hydraulic fracturing — or fracking — of shale rock for oil recovery. Forty years later, an advanced version of this technique would transform the domestic U.S. energy industry.

At Tulane, Shut down your school. Tulane University is scheduled to reopen, the board of administrators that enrolled in a Ph.D. program in aerospace engineering. Five years later, he was reappointed. Then Hurricane Katrina hit, flooding 80 percent of the Uptown Tulane campus. Altiero and his wife, Amy, joined the mass evacuation, bunkering down in a hotel in Arkansas. As Tulane shut down for the first time since the Civil War, President Scott Cowen skillfully used connections at the American Association of Universities and other organizations to find temporary academic homes — 492 in all — for 13,200 stranded students. Altiero says, “We have a big quilt in our student union building with a patch for each of the schools Tulane students attended. It takes your breath away.” Cowen also came up with an idea that Altiero said literally saved the university. The students would continue to pay their regular tuition fees at Tulane while they were studying elsewhere. “That kept the revenue flow coming to us in the fall semester, which kept us alive.”

Altiero returned to campus in late September, just as the last floodwater was being pumped out. The idea of reopening in January seemed wildly optimistic. But all involved recognized, he says, “that we had to get it opened by then. Otherwise, the university would have probably never opened again.”

ASEE’s president draws a lesson from the post-Katrina revival at Tulane: Play to your strengths.

By Pierre Home-Douglas

Imagine: You’re a dean of engineering, and your city has suffered the worst natural catastrophe in American history. The campus is trashed, with more than $500 million in damage. The entire semester is canceled. All your students have to find alternative schools to attend. And then, less than two months before the university is scheduled to reopen, the board of administrators issues a report with sweeping recommendations. One of them: Shut down your school.

This is what Nicholas Altiero faced at Tulane University in the wake of Hurricane Katrina in the fall of 2005. Nearly 10 years later, Tulane: Play to your strengths.

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By Pierre Home-Douglas

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“ASEE is the society for engineering education. So what I would like to do is take that simple thought and focus on four or five of the most important areas to concentrate on to support and improve engineering education.”

– Nicholas Altiero

“Nick took this new vision and gave it depth and meaning. It was his credibility that was on the line. There were a lot of people upset about what we were doing. Nick weathered all that and took a lot of naysayers and made them believers, and turned those believers into strong supporters for the school.”

– Scott Cowen, former Tulane University president

In the meantime, the board of Tulane met in Houston to approve a restructuring plan. “When they were doing their analysis of how ‘Tulane could recover, they looked at everything, every single department,’ Altiero explains. “In the school of engineering we had five departments, and three of them – civil and environmental engineering, mechanical engineering, and electrical engineering and computer science – were really too small to compete effectively against the best schools in the country. The other two departments, biomedical engineering and chemical engineering, were more comparable in size to those at peer institutions and were therefore much more competitive.”

The renewal plan called for eliminating the three undersize engineering departments, splitting the arts and science faculty to create a new school of liberal arts, and combining science with the remaining engineering departments within a new school of science and engineering. Cowen called Altiero into his office and said that the board wanted to offer him the inaugural deanship of the new school. “I said, ‘Scott, you know if I take the job I’ll want to rebuild engineering.’ And he said, ‘That’s good. Just don’t rebuild it the way it was; rebuild it to something that is competitive. We believe that the best way to do that is to combine science and engineering and have them feed off each other in a very synergistic way. As long as you can go with that, the rest is up to you.’”

Altiero accepted. The next academic year, 2006-07, was one of pain and exhilaration. He had to phase out three engineering departments, splitting the arts and science faculty to create a new school to see where science leaves off and engineering begins. It’s a STEM school, that’s what it is.”

Altiero says many people wondered whether science and engineering could work together. “Could it be a continuum rather than science at one end and engineering at the other? I think we’ve succeeded in doing that.” He adds, “I do believe that engineering is being driven by science more than ever before. If you look at the National Academy of Engineering’s Grand Challenges, they depend on scientific breakthroughs that haven’t been made yet. Traditionally engineers have drawn on science, but there has been a gap between a scientific breakthrough and its engineering application. If we’re going to be competitive, we need to drive down the lag between the two, and having an integrated science and engineering school is a great laboratory for that very thing. There’s something about having scientists and engineers sharing the same office space and coffee shops and talking to each other about what they do that is the way we need to go. I’m not saying people cannot collaborate if they aren’t part of the same school, but it certainly seems to make it a lot easier.”

His experiences at Tulane will, Altiero believes, affect his term as ASEE president as well. He recalls a public policy workshop in the spring of 2014 sponsored by 50 engineering societies. On the wall were the logos of the sponsoring societies, and all had “engineering” in them. But only one had education in it. “ASEE is the society for engineering education,” he says emphatically. “So what I would like to do is take that simple thought and focus on four or five of the most important areas to concentrate on to support and improve engineering education. That includes how engineering fits into the STEM disciplines. What is engineering outside of one letter in that acronym?”

He adds, “More and more K-12 classes are introducing engineering into their curriculum. At one level, I think that’s great to inspire young people to learn more about engineering and see the relationship between science and engineering. Still, as members of ASEE, we should be playing a major role in exactly what that is and what that means.”