SEARCH NEWS

Search News

ARCHIVE

News Archive

OPTIONS

News Story Idea
Publicity Request Form

RELATED LINKS

Calendars
A-Z Index
Directory
RSS Feeds

Regents Award winner Lozano engages her students through research

Contact: Jennifer Berghom, Public Affairs Representative
Posted: 10/14/2013

Students of Dr. Karen Lozano can expect to do much more experiential learning than sitting in a classroom taking notes.

Dr. Karen Lozano, the Julia Beecherl Endowed Professor of mechanical engineering and director of the Nanotechnology Center for Undergraduate Education, is one of six UTPA faculty members who won the The University of Texas System's 2013 Regents' Outstanding Teaching Awards.

"I guess what I do it's a different type of teaching," said Lozano, the Julia Beecherl Endowed Professor of mechanical engineering and director of the Nanotechnology Center for Undergraduate Education.

Even though she has a reduced teaching load so that she can focus on her research, Lozano devotes much of her time teaching students so that they can assist her in her research.

"In order for me to do the research, I have to do a lot of teaching," she said.

Her hands-on, one-on-one approach toward educating her students garnered her one of The University of Texas System's 2013 Regents' Outstanding Teaching Awards, the Board of Regents' highest teaching award. Lozano was one of six faculty members from UTPA to receive the award.

Lozano and her fellow UTPA faculty members were among 63 faculty members from the UT System's nine academic institutions selected to share $1.6 million in awards.

Each faculty member receives a $25,000 cash award, considered one of the largest in the nation for rewarding outstanding faculty performance.

To many in academia and industry, Lozano is best known for her research into nanotechnology, which led to the creation of the ForceSpinning™ technique of creating nanofibers and the establishment of UTPA's first multi-million-dollar start-up company FibeRio Technology Corp. What some might not realize, however, is that Lozano uses her research to effectively teach students, even at the undergraduate level, advanced concepts in engineering.

"If you're successful in research at UTPA, that means you are teaching quite a lot, but in a nontraditional way," Lozano said.

By providing students that experience, they can learn and retain very complex subjects that are not learned in a traditional classroom setting because they are facing the failures daily and determining how to fix those problems, she said.

"I guess the best award I could get, or the one I'm most proud of, is my students who work with me in these research activities and go through this learning process all get jobs or they all go to Tier I institutions for their master's and Ph.D.s," she said.

Lozano said she has students participate in research from the beginning, even as undergraduates.

"If I don't engage the student in the research right at the beginning he or she is not going to like research because they don't see immediate results," she said.

Her undergraduate students usually work 13-15 hours during the fall and spring semesters. To pique their interest early, Lozano has them work on small tasks to acclimate themselves to working in the lab and conducting research.

"If you want the student to come work for you in September and the student has no clue about what you're doing and you're going to give them papers to read, he or she will probably will be reading papers for the whole

year," Lozano said. "You've basically lost the student's motivation. It's not going to happen by reading papers all year."

Lozano used small research projects to educate and motivate her students who were working with her on the research that led to the ForceSpinning™ invention.

"When students were doing electrospinning, it was taking them five hours to develop a sample - I told you they work 13 hours a week - to develop something like this (shows a glass sample slide with a few nanofibers)," she said. "To do electrical testing on it, they don't even have fibers, so what are they going to do with that?"

Now that they have ForceSpinning™, students can create a sheet of material that is about the size of an 8 1/2 by 11-inch piece of paper in less than a minute.

"So now it's very easy to engage them," she said. "I'm always thinking of the projects that can give them a whole bunch of stuff so they can work on them right away. The most important thing is to get them to see and feel something so that they can be engaged."

A five-year, $2.7 million grant UT Pan American and the University of Minnesota Materials Research Science and Engineering Center received in 2009 from the National Science Foundation (NSF) has allowed Lozano to hire more students to help with research in nanomaterials. The grant, given through the NSF's Partnerships for Research and Education in Materials (PREM), allows the two institutions to work together on the development of polymeric and nanoparticle-based materials and devices and involve students in faculty research.

Lozano, who said she has 40 undergraduate students involved on PREM projects, called the grant a blessing.

"That grant consolidated materials scientists into one common goal: to foster the desire for students to study science and engineering and to do well and to attract them to the program," she said. "The ones who are benefitting the most are the students."

Lozano said 60 percent of UTPA students involved in PREM who have graduated have gone to graduate school and UTPA's PREM has had 28 publications in peer-reviewed journals, all with undergraduates as co-authors.

In letters of support, Lozano's former students recall how she challenged them and took time to help them.

"One of her qualities that I respect very much is how she always sees every one of her students as an individual, not as just another student in the class," wrote Simon Padron (BS '10, MS '12), who now works as an engineer at FibeRio Technology Corp. "She knows that behind every student there's a person with dreams and obstacles to overcome and always takes her time to discuss any questions or ideas her students may have."

Laura E. Espinoza (BS '08), who is a doctoral student in electrical and computer engineering at Texas A&M University in College Station, was a research assistant under Lozano's direction throughout her time at UTPA.

Espinoza, who decided to return to school after working at Texas Instruments for two years, said it was Lozano who inspired her to pursue a career in academia and research.

"In class, she provided me with great guidance and motivation and constantly encouraged me and the class to be very organized, very skeptical, extremely persistent, and always think outside the box," Espinoza wrote. "Dr. Lozano was always pushing her students to aim for high goals and work hard to achieve them. ...I decided to go back to school so I can one day be a great researcher and professor, just as she is."

Learn more about the Regents' Award winners at this website.