The University of Texas Rio Grande Valley™

Julia Beecherl Endowed Professor of Engineering

DR. KAREN LOZANO

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Breaking Ground in the Field of Engineering

What started as a dream in the 5th grade has turned into a flourishing and meritorious career for Dr. Karen Lozano. Dr. Lozano, a professor at The University of Texas Rio Grande Valley (UTRGV), currently holds the Julia Beecherl Endowed Professorship and is the Founding Director of the University's Nanotechnology Center.

Dr. Lozano knew from a young age that she wanted to pursue a career in technology. Born and raised in Mexico, she was witness to the hard work her parents exemplified day in and day out – a mother who always held two jobs, one as a housewife and the other as a seamstress, and a father whose physically demanding job was to provide fruits and vegetables to local restaurants. Her parents encouraged her to chase her dreams; they told her that she had God-given talents and that she should work hard to cultivate those talents, regardless of the stereotypes and barriers that may stand in the way. When Dr. Lozano selected mechanical engineering as her major of choice she knew that it could be a career with endless opportunities, but she was not certain it was an acceptable career path for a woman. Thanks to her mother's encouragement, she decided to follow that path less traveled.

In many ways, Dr. Lozano broke ground as a female in the field of engineering. She was the only woman to graduate in her class at Universidad de Monterrey (1993), and only the fifth woman to graduate in the history of the University. After earning her Bachelor of Science in mechanical engineering, she was offered a space in an outreach fellowship program at Rice University in Houston, TX. It was there that she earned her Master of Science (1996) and Doctorate (1999) degrees – she was the first Mexican woman to earn a doctorate in science and engineering from Rice University, and fifth among all women to receive a doctorate from Rice's mechanical engineering and material sciences department.

Dr. Karen Lozano pictured with her son during graduation at Rice University in 1999.

Throughout her career Dr. Lozano has established herself as a prolific inventor; she holds over 45 patents / patent applications. She is a co-founder and the chief technology officer of FibeRio Technologies Corporation, a Rio Grande Valley-based company that focuses on the industrial production of nanofibers using Forcespinning® technology. This innovative method uses centrifugal force, rather than electrical forces like its predecessor, electrospinning, allowing for more versatility to use both solutions and melted materials to create super fine fibers. The award-winning and internationally-lauded technology has transformed the materials market, resulting in unparalleled production capacity of more cost-effective nanofibers.

Reflecting on her career achievements thus far, Dr. Lozano said, "All my life I have worked so hard. Nothing has been easy, but I have learned that through perseverance and hard work, dreams can come true."

SPARKING CURIOSITY AND A PASSION FOR SCIENCE

Dr. Lozano also has a passion for instilling creativity, innovation, and a love for the sciences in children and young adults. Over the past 20 years she has developed numerous summer camps, workshops, and presentations to reach younger audiences. To further that reach, and under advisement from her teenage son, she launched "Karen's Lab," a YouTube channel in English and Spanish to promote STEM-based innovation. With videos like how to make the best slime by understanding the science behind it and demonstrating sublimation with dry ice, "Karen's Lab" encourages innovation by making science relatable and fun.

"On average, 'Karen's Lab' is watched for 800 minutes per day, meaning I am talking to kids for more than 13 hours a day though I am here on campus, working on research projects," said Dr. Lozano. She goes on to say she encourages young minds to pursue a career in STEM (science, technology, engineering, and mathematics) because it "is an area of opportunity. There are many unsolved challenges and we need fresh ideas to work on those to further benefit our society."

That passion Dr. Lozano has for educating young minds carries through to her work as a professor at UTRGV. She actively involves students in research, facilitating an experiential learning environment wherein the students thrive. She instills in them curiosity, the inherent need to question and explore the world around them, and to do so with a strong work ethic. Seeing them succeed is what inspires Dr. Lozano to continue her engineering explorations.

"My inspiration comes from our wonderful UTRGV students; witnessing their amazing transformation as they participate in research projects and the opportunities they receive upon graduation is priceless."

When speaking about the Julia Beecherl Endowed Professorship, Dr. Lozano asserts that students benefit from noteworthy research projects made feasible through its funding. The majority of Dr. Lozano's current research is focused on the processing-structure-property relationship of nanofibers and nanofiber-based devices, as well as nano-reinforced polymer composites. She is also researching the development of materials for biomedical and aerospace applications.

Dr. Lozano's long-term goals for the endowed professorship include the development of a stronger, collegial team "that could be highly productive in terms of peer reviewed quality journal articles and conference presentations."

"This endowment encourages me to do my very best, be as creative as possible, and work as hard as I can to open opportunities and develop projects that encourage and motivate our students to succeed." She states that at least 400 students at UTRGV have directly benefitted from her research projects (plus thousands through lectures and outreach activities), and they are all leading exciting careers around the country.

BREAKING BARRIERS AND SETTING THE STANDARD

Dr. Karen Lozano is a force to be reckoned with. She has not allowed stereotypes hinder her pursuit of a career in engineering, and that perseverance has paid off in many noteworthy ways. In 2013, she received the Regents' Outstanding Teaching Award from the University of Texas System Board of Regents, which is one of the nation's largest teaching recognition programs in higher education. That same year, she participated in an immigration roundtable at the White House with President Barack Obama. In 2015, she was named Engineer of the Year by Great Minds in STEM™. At that time, she was the third woman to receive the distinction in 27 years. In 2016, she was appointed as a member of the Editorial Board for the Journal of Materials Science and Research. She's been recognized by the Latinas of Influence, received an Outstanding Research Award from the American Association of Hispanics in Higher Education, and was featured in the 2016 White House report on international entrepreneurs, in which she was recognized as an immigrant entrepreneur making exceptional contributions to the U.S. economy. And in 2018, she was selected to receive the Mexicanos Distinguidos Award from the Government of Mexico and the Institute for Mexicans Abroad.

While undoubtedly humbled by these many awards, Dr. Lozano said, "At the end of the day, it is 99% hard work and 1% talent. Nothing happens without the hours invested."

One of the achievements Dr. Lozano is most proud of is receiving a PhD from one of the best institutions in the country with the odds stacked against her: Latina, not fluent in English, young mother, and female in the male-dominated field of mechanical engineering. She also cites receiving the National Science Foundation (NSF) CAREER Award at the age of 27 as one of her most memorable accomplishments. Dr. Lozano was recognized for demonstrating her innovative research and community service focused on scientific education and outreach. "It was such an exciting moment that threw 200 pounds of responsibility over my shoulders," said Dr. Lozano. "I had to prove that they were correct, that I could be a good scientist."

On a more granular, and arguably more affective, level, Dr. Lozano has had a profound impact on the education of students in the Rio Grande Valley. Hired at UTRGV's legacy institution, the University of Texas-Pan American, in 2000, she was the first woman to join the University's engineering department. She provides hands-on learning opportunities for young scientists. The research her students participate in is nationally-recognized and awarded, and she has developed interactive educational videos for children to spark their interest in STEM. Referencing the multiple funded projects, Dr. Lozano said, "they have given me the opportunity to help students, give them a head start in their careers – not by doing their job, but by providing them with a blank page, an opportunity to blossom."

Dr. Lozano is the embodiment of excellence through innovation. She excels at educating young minds, performing community service and, with a determined focus to succeed, she has made a lasting impact on the field of science and technology. We are grateful to have such a brilliant woman motivating and molding students at the University of Texas Rio Grande Valley.

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