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# Persisting Through Barriers of Inequality: A Biography of Dr. Seema Nanda

In West Bengal, India, where Seema Nanda grew up, traditional patriarchal norms have relegated women to a lower status than men in all aspects of life. Attending school for many girls is not an option. The women in Seema's life were not able to escape these limits: her grandmother was illiterate, and her mother, though intelligent, wasn't allowed to attend college. Even from a young age, Seema was keenly aware of the gender difference and was deeply impacted by the effect it had on the people she loved. "I had a hard time accepting the fact that my father would come home from work, put his feet up, and get a cup of tea while my mom would be working literally all times of the day," said Seema. Thus, she knew, even at a young age, that she wanted to break the mold and be different.

In school, despite excelling in mathematics, Seema never considered mathematics to be a viable career. "Nobody ever talked about being a mathematician," recalled Seema, "I didn't know about that opportunity." Thus, after graduation, she pursued a liberal arts degree before leaving India to get an MBA at Baylor University and work in finance.

No matter where Seema went, however, she found herself constantly drifting back to her hobby of mathematics. In high school, she would pick up her father's old math textbooks during her free time and teach herself the idea of limits. The challenging problems interested and entertained her.

Even though Seema was accomplished in her finance career, she was getting bored of her job. She again picked up the familiar textbooks and delved back into her hobby of solving problems. Her own books, however, couldn't satisfy Seema's curiosity. Eager to learn more, Seema applied and was accepted at the Claremont Graduate University, where she began to take mathematics courses.

Seema was enthusiastic and hard working. Every day, she would go to work at six in the morning, take a break at eight to attend class, then come back and work until five before going home to do her math homework. After taking several calculus courses, Seema decided that she wanted to pursue mathematics further. She then gave up a promising career in banking and began to study mathematics at the California State Polytechnic University.

Seema started with linear algebra, logic and differential equations, the basics, but after two years, she was taking several graduate school courses. What started out as simply wanting to learn more mathematics

developed into a passion. “I threw myself into mathematics. It was the best time of my life,” said Seema, “I realized that math had been the only thing in my life that I had been constantly interested in; it’s the only thing I don’t get tired of.” It was then that she decided that she wanted to become a full-time mathematician. Determined to pursue a career in math, Seema joined the mathematics Ph.D. program at New York University.

After graduating, Seema worked for three years in mathematical finance on Wall Street before becoming a post-doctoral fellow at the University of Tennessee working on problems in mathematical biology. She then spent several years at the Tata Institute of Fundamental Research in Bangalore, India to help start research in mathematical biology there. She is now at Dartmouth College as a visiting associate professor teaching and conducting research in applied mathematics.

Throughout her academic journey, Seema encountered many challenges as a female. In India, as a rare female scientist, she was constantly targeted. When she graduated from New York University, she was the only female in her class. “I had no role models,” said Seema, “and it affected my confidence in a negative way.”

The adversities Seema experienced during her career had profound impacts on her. She was extremely bothered by gender inequality, especially in India, where women have access to far fewer resources than their male counterparts. “Education is what sets a woman free”, said Seema, “It’s the first step to empowering women.” Thus, while she was in India, she spent much of her free time volunteering at poor elementary schools teaching mathematics.

At the slum schools, Seema noticed that very few girls received enough education to earn a good living. Seema wanted that to change, so she started a foundation, the Leora Trust, that helps empower women through education. The Leora Trust has continued to partner with schools and businesses in Bangalore to mentor and provide educational support for young girls, especially in mathematics. “A mentor is important for success, but I find that fewer women have mentors compared to men,” says Seema. The goal of the Leora Trust is to instill self confidence in girls through literacy and education.

Seema wants to see girls be more comfortable and confident in the field of mathematics. “It’s important to not be afraid to ask questions,” said Seema, “but the male dominated nature of mathematics have created stresses that has been detrimental to learning mathematics for girls.” Seema discovered, however, that when she started voicing her questions openly, her fears of rejection dissipated. “It’s very important to discuss with people in mathematics,” Seema advises, “it’s how your ideas get shaped, solidified, and matured. Contrary to the traditional view, mathematicians don’t work in complete isolation. It’s especially

important for women to throw their fears aside and talk with others. It's okay to be wrong because you'll learn from your mistakes."

"It's been a journey of self-discovery," reflected Seema. Her non-traditional path to mathematics has taught her so much about herself, the world, and, of course, mathematics. Despite the numerous challenges she's faced, Seema has met them all with courage and perseverance. Through the Leora Trust foundation, Seema has undoubtedly impacted hundreds of girls by giving them opportunities that they would have never had. The passion Seema advocates for gender equality, especially in education, has inspired me and many other women. Seema continues to be a role model for girls throughout the world to pursue their dreams.

About the Student

As a James O. Freedman Presidential Scholar and third year student studying mathematics and biology, I am excited to learn about the applications of mathematics, especially to the field of health sciences. After graduation, I hope to pursue a Ph.D. in Applied Mathematics or Computation Biology and conduct academic research in a cross disciplinary mathematics and biology field to enhance patient care. In my free time, I enjoy drawing with color pencils as well as baking for my friends and family.