



Breaking Barriers in Science: A Q&A with Dr. Jing Wang



Bio

Dr. Jing Wang is a distinguished physics professor at Eastern Kentucky University with 15 years of experience in Physics Education Research. She earned her undergraduate degree in Engineering Physics from Tsinghua University and completed her Ph.D. in Physics at Ohio State University. With a strong academic foundation, she has made significant contributions to education assessment and teacher preparation. In addition to her academic endeavors, Wang enjoys reading books.

Introduction

Q: Could you tell us about your journey in becoming a professor at Eastern Kentucky University?

A: Sure. I was born and raised in China, where I studied Engineering Physics at Tsinghua University. I spent seven years there, got both my bachelor's and master's degrees in this field. Then, I moved to the United States to continue my studies at the Ohio State University, where I focused on physics education. I obtained my PhD degree in physics after five years. Since then, I have been working as a physics professor at Eastern Kentucky University.







Q: What made you become interested in education assessment and teacher preparation?

A: Physics education research is the study of how people learn physics. This job is traditionally done by education researchers, who often work in the college of education and train pre-service teachers for the K-12 level. However, there is a gap between the education and science departments: K-12 teachers may not be familiar with the discovery process in science, and college science professors may not have adequate training in teaching methods. Therefore, students may struggle to learn science effectively in college.

Some physicists believe that we can help to bridge this gap by applying the scientific approach to education. Just like any other science discoveries, we identify the problem, design experiments, collect data, and create mathematical models to predict future outcomes. We also implement what we learn in the classrooms, especially with pre-service and in-service teachers, to help them prepare their students for college science courses. This trend of discipline-based education research originated from physics, and now it has spread to other science disciplines, such as chemistry, biology, computer science, etc.







My personal interest lies in educational assessment, which I see as the probe or detector in this field. I enjoy working with data and analyzing the results of education experiments. I also find it rewarding to work with teachers and share with them what I have learned, hoping to make a positive impact on their students' learning.

Q: How did you become fascinated with physics?

*A: I wasn't fascinated with physics until much later in my life. As a young girl I had many interests. When I was in 8th grade, I wanted to be a writer. My father is a journalist. Although I didn't want to follow his career path, I was interested in creative writing. I also excelled in all the science courses, so I knew I had other options. In China, students will choose their directions at the end of 10th grade or 11th grade, generally between humanity and social sciences or STEM. The courses and the college entrance exams they will take depend on their choice. By the end of 10th grade, I was torn between becoming a writer and an engineer. Both seemed very appealing to me. I chose the writer. At the beginning of 11th grade, I went to a different classroom to take different courses. I sat there for one day, and thought to myself: **THIS IS NOT RIGHT**. At that time, I thought I knew a lot about this path, because my father's*

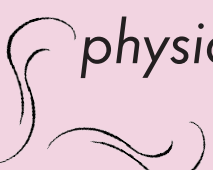




experience. I thought about all the interesting science courses I had taken, and felt there was still so much more for me to explore. I didn't want to miss that. So I changed my decision and took the STEM path.

Of course, I made the decision with very little information about either side. I mean, all the information were there, I just didn't know where to get it, and even if I got it, I didn't know how to process it. But I listened to my own instinct and never regretted it.

That being said, I didn't become fascinated with physics until I start to teach. Compare to other subjects like math or chemistry, physics is my favorite, but I wouldn't call it "love". Then I started graduate school and had to teach undergraduate students as a teaching assistant. By the end of the first semester, I had students telling me that "you should teach". A student said I was the best teaching assistant he ever had and even wrote me a card by the end of the semester. That was my first year in the States and I wasn't quite on board with the American style of exaggerated compliments. So it had a great impact on me and I thought being a college professor could be interesting. After two years of exploring in graduate school, I choose physics education research as my direction, which allowed




me to not only teach physics, but also study how to teach physics.

Teaching physics allows me to appreciate physics from a completely different perspective. To teach any subject, you need to have a holistic view of it. All the little excitements I had experienced in physics now came together: how everything works in this universe, the fundamental laws of nature, the great discoveries made by predecessors that guides us today, and so on. I delved into the history of physics, and that really matched my personal interest in humanity and social sciences. Over the years, I became more and more passionate about physics, and want to pass my passion to my students.

Diving Deep

Q: What was the proudest achievement you'd like to share with us?

A: My students. To become a part of their lives is an amazing experience. I have witnessed their growth and achievements, as well as their challenges and struggles. A single mom who went to graduate school and eventually became a radiologist. A 52-year-old lady who came back to college for a nursing degree. A father and college-drop-out





who came back to sit in the same classroom as his daughter. An Iraq veteran who took physics and eventually became an inventor and entrepreneur. A Sweden Olympian athlete who took courses between training sessions. A Mexican-born Korean kid who wanted to become a physicist instead of working in his father's firm. I feel so proud that I was part of their journeys to pursue their dreams. I taught them physics, and they taught me about life.

Q: What are the unique challenges of pursuing a career in academic institutions? What inspired you to continue when facing challenges?

A: Pursuing a career in academic institutions is a long journey. To begin with, you have to go to graduate school and get a PhD. You need to decide your real interest: doing research, or teaching. Then landing a job in an academic institution. Sometimes you have to repeat this step several times until you find the place you really want to be. When you are in graduate school, your college friends will be earning a decent salary, having a non-school, REAL life. You will keep asking yourself, is this what you want to do?

To me, the real challenge was to understand myself in this process, to know who I really am, what I was really







interested in doing, and to decide if I wanted to do this for the rest of my life. One thing I knew for sure was that I enjoy learning new things. At that time, I wasn't sure if I wanted to continue the PhD program, so I took a lot of courses in statistics. I was told that it is very easy to land a job as a statistician; what I didn't know is that, it led me to the field of psychological measurement. Eventually my thesis topic was applying psychological measurement methods in physics education. Now looking back, I feel this journey was full of great surprises if you keep doing what you love to do.

Q: Do you have any advice for your younger self? Is there anything you would change in your path to where you are now?


A: I will tell my younger self to never set a limit. You probably hear a lot about the "growing mindset" now in school. This was not an emphasis in my education. I wish I had learned about that. However, I can't think of anything that I would like to change though. We say life is full of options, but once you pick one, it becomes part of your story. I rarely look back.






Q: How do you strike a balance between your professional and personal lives?

A: This is a tough question. I don't know if I have a good answer. To me, there is really no "balance" between professional life and personal life. You just have to make every little decision in your life. And this starts earlier than you might think. Do you want to go to graduate school and spend five or six more years in school? When you graduate, do you want to take that job that is far away from your family? If you are married, do you want to live and work in the same town as your spouse even if you can't get a good job there? As a young faculty member, do you want to have a baby in your first five years and risk your chance of getting tenure? If you have a high-maintenance child, are you willing to spend more time to take care of your child? None of these questions are easy, and they only get harder and harder as you grow up. I don't know how to achieve balance here. However, I do believe that the stronger you are in your career, the more options you will have, both in professional life and in personal life. Most of the time, you will know the answer to these questions by listening to your heart. But if you ever hesitate and can't decide which way to go, go with the way that will make you stronger.





Q: What do you think are the most important characteristics for someone to have a successful career in the field of physics?

A: Curiosity and persistence. I believe persistence are important qualities for people in all fields of study. Curiosity is of paramount importance in all sciences.

Q: Do you have any advice or resources to share with STEM & ROSE members (people who don't fit the usual mold of a STEM enthusiast)?

A: Be curious. Curiosity is the most powerful drive to advance homo sapiens in this world. Don't ever lose that. Keep asking questions even if there are no answers. Keep learning new things even if they seem to be "useless" at the moment.

