

Lessons from Dr. Paul Zia

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The passing of Dr. Paul Zia this past August has provided an occasion to reflect on the life, achievements, and lessons of this extraordinary man. Dr. Zia was 97 years old at the time of his passing, and he is survived by his wife, two children, and four grandchildren. In addition, the hundreds of students, faculty, and professional colleagues he advised and mentored over the years, including the authors of this article, remember him fondly and with gratitude. Many of us have Dr. Zia to thank for positively influencing our lives and for shaping major portions of our careers. He was recently described by a colleague as an “educator, mentor, scholar, researcher, engineer, and true gentleman.”

We will briefly summarize some of the lesser-known details of Dr. Zia’s fascinating biography here. More detailed accounts of his life and career are available from a variety of sources, including the Fall 2012 issue of *PCI Journal* and the October 2023 issue of *Concrete International*.^{1,2} The most unique source is a nearly two-hour interview conducted in 2015 by the North Carolina State University (NCSU) Libraries, in which Dr. Zia describes his personal history and offers insightful recollections and commentary on his teaching, research, and work with industry.³

Born near Shanghai, China, in 1926, Paul Zung-Teh Zia was the youngest of seven children, six of whom studied engineering. By the time Paul graduated from Chiao Tung University in 1949 with a degree in engineering, Mao and the Chinese Communist Party had encircled Shanghai and were beginning to drive out the Nationalist government. Paul had been admitted to a work-study program at Florida Southern College (FSC) in the United States. As the Nationalists retreated to Taiwan, Paul was able to secure passage out of Shanghai on one of the final freighters to leave the besieged city, eventually arriving safely in Hong Kong.

After reaching Taiwan, Paul was eventually able to obtain his passport from the exiled Chinese Nationalist government’s Hong Kong consulate. He then traveled to Florida, along with his future wife, Dora Yun-Qing Liu, who was enrolled in the same program. Upon arriving in the United States, Paul worked as the school janitor as part of his work-study arrangement. He reflected on this position later in life as one of his best experiences because the job taught him how things worked and how to fix things that were broken—practical skills that no doubt served him well later in his career. In due time, Paul and Dora were both accepted as master’s degree students at the University of Washington (UW) in Seattle. Paul would work for Professor Bert Farquharson, who, interestingly, can be seen in a famous historical video as the last person walking off the Tacoma Narrows Bridge before its collapse in 1940.

The summer before leaving for UW, Paul’s work-study arrangement at FSC had ended, so he applied for temporary work at a local employment office. Upon reviewing his qualifications, the employment office clerk suggested that

he instead ask for work at Lakeland Engineering Associates (LEA), a small firm housed in the same building as the employment office. Paul landed a summer internship with the firm and continued to work for LEA while pursuing his master’s degree at UW. After graduating from UW in 1953, he returned to work full time for LEA at a new subsidiary, Lakeland Engineering Associates Prestressing (LEAP). During these years, a brand-new prestressed concrete industry was created, which led directly to the founding of the Precast/Prestressed Concrete Institute (PCI). Paul was at the forefront of early prestressed concrete concepts, designs, and experiments, and he helped implement many of the first prestressed concrete building projects in Florida.

Despite being recognized as an international expert in prestressed concrete by this early stage of his career, Paul was not content with the limits of his knowledge and decided to join the University of Florida in 1955 as an instructor and PhD student. He desired to earn a PhD, to teach, to conduct research, and to “find out the answers to some interesting questions [about prestressed concrete].”³ His

Dr. Paul Zia and a PCI Research and Development Council advisory group observe testing on punching shear in prestressed concrete beam ledges at the North Carolina State University Constructed Facilities Laboratory in 2013. All Photos: North Carolina State University.





Dr. Paul Zia and his grandchildren observe a prestressed concrete beam experiment at the North Carolina State University Constructed Facilities Laboratory in 2015.

career from this point forward is well documented, as he went on to accept a faculty position at NCSU, serve as a visiting faculty at the University of California at Berkeley with Professor T. Y. Lin, and eventually become a head of the Civil Engineering Department at NCSU. Dr. Zia's achievements in these positions, which are too numerous to list here, include hundreds of research projects, publications, and awards. He was elected in 1983 to the National Academy of Engineering, arguably the highest honor an engineer can receive, and he served as president of the American Concrete Institute (ACI) in 1989. His vision and effort were central to the creation in 1996 of the Constructed Facilities Laboratory at NCSU, an experimental testing facility that enables the type of large-scale structural engineering research for which Dr. Zia is well known. His research on precast and prestressed concrete spanned nearly seven decades, from the mid-1950s until 2023, and his work heavily influences modern prestressed concrete engineering design. Dr. Zia is also recognized for his role in the highly technical move of the Cape Hatteras Lighthouse in 1999, an ambitious project undertaken by the National Park Service to save the 200-ft-tall brick structure from encroaching seas.

Having the opportunity to work closely with Dr. Zia for many years was a true honor and a privilege for the authors of this article. We have learned many lessons from Dr. Zia that we carry with

us today. He was solidly grounded in the fundamental sciences that underpin engineering and he distilled every problem down to its basic components. Dr. Zia ensured that his students would gain a strong working knowledge of mathematics, statics, dynamics, and mechanics, and apply a deep understanding of those topics to the engineering problems at hand. He enjoyed problems that seemed complex at first, but with the right pieces of fundamental knowledge, could be solved easily with an elegant approach.

As an academic, Dr. Zia greatly valued research, teaching, and collaboration with industry, which are the three main components of the NCSU land-grant mission. Dr. Zia frequently articulated that each of the three elements of this mission are strengthened by the other two, and he worked tirelessly throughout his career to involve students in all aspects of his work. He encouraged and exemplified a practical approach to research and to engineering problem-solving by routinely spending significant portions of his time in the laboratory—engaged with students and staff—personally conducting and observing the experiments he supervised.

His teaching followed a similar philosophy, as he instructed his students from the basis of sound fundamentals and practical design problems. Dr. Zia also encouraged his students to follow his example of implementing and applying work in the public and private sectors by engaging with practitioners, engineering associations, regulatory agencies, code-writing bodies, and industry groups. He strongly advised students to get involved with the regional and national organizations that support our shared engineering profession such as the American Society of Civil Engineers, ACI, and PCI.

Most importantly, we observed the kindness, patience, and respect Dr. Zia showed to all with whom he interacted. Despite his incredible depth of knowledge, his endless awards and accolades, and his fascinating and sometimes difficult life, Dr. Zia was always ready and willing to listen carefully to any suggestion, concern, or

comment that a student or colleague wanted to share. He was dedicated to his family, and he and Dora would frequently welcome students and colleagues into their home. He allowed students the space to develop their own ideas, while helping guide those ideas from the perspective of solid first principles. He would debate colleagues from a position of respect, even when he disagreed with their viewpoints. Dr. Zia was a student of everything around him, and he did not limit his desire to learn to the boundaries of his own profession. He was a strong supporter of integrating research, teaching, and the application of knowledge in industry to tangible problems.

Dr. Zia was truly a model academic, an outstanding engineer, and an inspiring person.

Note: The authors are grateful to Dr. Zia's children, May and Lee, for sharing some of the historical details of his biography.

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