

Professing My Perspective: It's Evolutionary

by Dr. Jill Walsh, Saint Martin's University

In 2002, fresh out of the University of California in sunny San Diego, with my PhD in hand, I found myself weighing the urge to teach against my lack of experience. Although I had built and tested 40%-scale bridge models and completed rigorous courses, that alone wasn't enough for me to feel good about hanging a "Professor Walsh" placard outside a lecture hall door. So, I went to work with T. Y. Lin International, where I was fortunate to learn from and work with some of the best bridge engineers and contractors in the world on exciting and challenging projects. I did this for more than a decade, working on teams that built the Mike O'Callaghan-Pat Tillman Memorial Bridge spanning the Colorado River between Arizona and Nevada and the Port Mann Bridge in Vancouver, British Columbia.

But by 2015, I was ready to make my way back to academia and accepted an assistant professor position at Saint Martin's University, a small liberal arts college, in Lacey, Wash. With my hard-won knowledge of analysis and concepts

I had applied in the field, I was ready to share with students what it meant to work hard and be self-sufficient, and that there is absolutely no crying in engineering.

That same year, the first members of the so-called Generation Z were turning 18 and entering college. Gen Z is defined by birth dates between 1997 and 2012; the cohort is currently between 12 and 27 years old. Those who came before them have often mischaracterized Gen Zers as being lazy and have claimed they had it too easy. Because Gen Z is the first generation to be fully digital, there was plenty of anecdotal evidence to support this view.

Gen Z and a New Way to Learn

In her book *Gen Z, Explained: The Art of Living in a Digital Age*,¹ Stanford University professor Roberta Katz and her coauthors explain that Gen Z has only known a world of endless information, having never lived a life without the internet. They state, "Every generation inherits a world they did not make, but

Gen Zers are especially concerned about what they face, from faltering institutions to increasing inequality to climate change. They have no choice but to turn to the tools with which they have grown up—digital technologies and networks—to try to solve these problems. They are aware that the digital technology that causes problems might also offer some of the solutions."

In addition to Gen Z's technological finesse, the researchers found Gen Zers to be highly collaborative and social. Members of Gen Z strive for diverse communities and care deeply about others. They have access to all the information in the world and technological skills to "work smarter." But this mantra is potentially dangerous if context and understanding are lacking. With artificial intelligence poised to eliminate many of the procedural aspects of engineering, new engineers need to be able to provide meaningful input and look critically at the output.

Generation X and the Old Way to Learn

Generation X includes anyone born between 1965 and 1980. Like any proud, flannel-wearing Gen Xer, I took pride in my latchkey-kid status. While we didn't use punch cards in college, we did use Lotus 1-2-3 and took FORTRAN programming. My undergraduate professors wrote equations on chalkboards spanning the width of one wall. Reaching the end of the board meant returning to the starting point and erasing the previous equations—a learning environment that would seem otherworldly to today's students.

By the mid-1990s, Netscape was the best browser to search the World Wide Web. By graduate school, I was saving Excel files on a floppy disk (the object on which the Microsoft Save icon is based). But we still wrote our

Dr. Walsh on a site visit in 2009. All Photos: Jill Walsh.





St. Martin's University 2018 graduation. From left to right: Clarinda Marion, Will Miller, the author, Micaylla Young, Cameron Reece, Dr. Floraliza Bornasal, Dr. Jae Chung.



2024 Future Engineers. From left to right: Abraham Debasu, Edward Suppes, Eli Eldridge, Andrew Milholland, Marcus Hurley, Jeffrey Lowe.

homework on paper and waited a week for feedback. We still scrolled through microfiche for historical journal articles. That's how you learned, and it was good enough for us.

Boomers and Gen X

At T. Y. Lin, I depended on the experience and knowledge of my supervisors and reveled in collaborations with coworkers. Engineers develop an appreciation and understanding of design details through experience. We understand the evolution from allowable stress design (ASD) to load-and resistance-factor design (LRFD)—and how a quick ASD calculation can provide a nice starting point or gut check. We know that “Chapter 17: Anchoring to Concrete” of the American Concrete Institute’s *Building Code Requirements for Structural Concrete (ACI 318-19) and Commentary (ACI 318R-19)*² made its first appearance as Appendix D to ACI 318-02 and received considerable review and expansion following the 2006 collapse of the ceiling panels in the Ted Williams Tunnel in Boston, Mass. We know that current ductile design details evolved from work presented in Thomas Paulay’s and Nigel Priestley’s 1992 book, *Seismic Design of Reinforced Concrete and Masonry Buildings*.³ The generational passing of engineering knowledge is vital for efficient, effective, and safe structures. Structural history dictates the structural future. The Mike O’Callaghan–Pat Tillman Memorial Bridge girder-to-concrete pier cap connections would not be the same if not for experiences learned during the construction of Missouri’s Creve Coeur Lake Memorial Bridge.

Gen X Teaching Gen Z

My educational background contributed to my “No, I will not save the lecture slides for you” mentality when I started teaching. I now share skeleton slides before class and post slides with class notes afterward. We work through problems together in class. This is a simple example of adapting to Gen Z’s way of learning. I find myself increasingly impressed by my students and no longer feel it is my job to “toughen” them up. COVID-19, climate change, and the speed of technological developments have done that.

Fortunately, Gen Z is a generation of highly adaptive learners who come from diverse backgrounds and are equipped with creative solutions and pragmatic optimism. And while they have access to endless historical information, there is no substitute for the retained knowledge and comprehension that can only be found in the work environment, on a project, or in direct collaboration with a supervisor. And those who are lucky enough to work alongside this new generation of engineers? Get ready to watch them do what that Microsoft floppy disk icon does best: save our work.

“Help Me Change the World”

In his last message in 1941, Boy Scout founder Robert Baden-Powell told the scouts, “Try and leave this world a little better than you found it.”⁴ I’m not sure my generation can claim we heeded his advice. Gen Z has inherited climate change, resource depletion, gentrification creep, and the rapid rise of artificial intelligence.

One of my students wore a sweatshirt with the phrase “Help me change the world.” If I had to identify one group capable of changing the world, it would be engineers. From the engineering accomplishments of the Brooklyn Bridge to the ingenuity of accelerated bridge construction and the James Webb Space Telescope launched in 2021, engineers have repeatedly proved that the impossible is possible.

Now imagine combining Gen Z’s energy, technical efficiency and pragmatic optimism with veteran engineers’ experience, knowledge, and historical wisdom. Together, they will build a bridge between generations that changes the world.

References

1. Katz, R., S. Ogilvie, J. Shaw, and L. Woodhead. 2021. *Gen Z, Explained: The Art of Living in a Digital Age*. Chicago, IL: University of Chicago Press.
2. American Concrete Institute (ACI). 2019. *Building Code Requirements for Structural Concrete (ACI 318-19) and Commentary (ACI 318R-19)*. Farmington Hills, MI: ACI.
3. Paulay, T., and M. J. N. Priestley. 1992. *Seismic Design of Reinforced Concrete and Masonry Buildings*. New York, NY: Wiley.
4. Badden-Powell, R. n.d. “B-P Last Will.” Archived October 11, 2019, at the Wayback Machine. Accessed January 11, 2024. https://web.archive.org/web/20191011152418/https://www.scout.org/sites/default/files/library_files/B-P%20Last%20Will.pdf. 